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REPORT OF
THE ACTING SECRETARY OF
THE SMITHSONIAN
INSTITUTION

1927

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SMITHSONIAN INSTITUTION

WASHINGTON

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REPORT OF
THE ACTING SECRETARY OF
THE SMITHSONIAN
INSTITUTION

FOR THE YEAR ENDING JUNE 30

1927



(Publication 2923)



UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON

1927

TO THE
SECRETARY OF THE
COMMISSION ON
CONSTITUTION

ENDING FIVE
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THE SMITHSONIAN INSTITUTION

June 30, 1927

Presiding officer ex officio.—CALVIN COOLIDGE, President of the United States.

Chancellor.—WILLIAM HOWARD TAFT, Chief Justice of the United States.

Members of the Institution:

CALVIN COOLIDGE, President of the United States.

CHARLES G. DAWES, Vice President of the United States.

WILLIAM HOWARD TAFT, Chief Justice of the United States.

FRANK B. KELLOGG, Secretary of State.

ANDREW W. MELLON, Secretary of the Treasury.

DWIGHT FILLEY DAVIS, Secretary of War.

JOHN G. SARGENT, Attorney General.

HARRY S. NEW, Postmaster General.

CURTIS D. WILBUR, Secretary of the Navy.

HUBERT WORK, Secretary of the Interior.

WILLIAM M. JARDINE, Secretary of Agriculture.

HERBERT CLARK HOOVER, Secretary of Commerce.

JAMES JOHN DAVIS, Secretary of Labor.

Regents of the Institution:

WILLIAM HOWARD TAFT, Chief Justice of the United States, Chancellor.

CHARLES G. DAWES, Vice President of the United States.

REED SMOOT, Member of the Senate.

WOODBRIDGE N. FERRIS, Member of the Senate.

JOSEPH T. ROBINSON, Member of the Senate.

ALBERT JOHNSON, Member of the House of Representatives.

R. WALTON MOORE, Member of the House of Representatives.

WALTER H. NEWTON, Member of the House of Representatives.

CHARLES F. CHOATE, jr., citizen of Massachusetts.

HENRY WHITE, citizen of Washington, D. C.

ROBERT S. BROOKINGS, citizen of Missouri.

IRWIN B. LAUGHLIN, citizen of Pennsylvania.

FREDERIC A. DELANO, citizen of Washington, D. C.

DWIGHT W. MORROW, citizen of New Jersey.

Executive committee.—HENRY WHITE, FREDERIC A. DELANO, R. WALTON MOORE.

Acting Secretary.—C. G. ABBOT.

Assistant Secretary.—ALEXANDER WETMORE.

Chief Clerk.—HARRY W. DORSEY.

Accounting and disbursing agent.—N. W. DORSEY.

Editor.—W. P. TRUE.

Librarian.—WILLIAM L. CORBIN.

Appointment clerk.—JAMES G. TRAYLOR.

Property clerk.—J. H. HILL.

NATIONAL MUSEUM

Assistant Secretary (in charge).—ALEXANDER WETMORE.

Administrative assistant to the Secretary.—W. DE C. RAVENEL.

Head curators.—WALTER HOUGH, LEONHARD STEJNEGER, GEORGE P. MERRILL.

Curators.—PAUL BARTSCH, R. S. BASSLER, T. T. BELOTE, AUSTIN H. CLARK, F. W. CLARKE, F. V. COVILLE, CHARLES W. GILMORE, WALTER HOUGH, L. O. HOWARD, ALEŠ HRDLÍČKA, NEIL M. JUDD, H. W. KRIEGER, FREDERICK L. LEWTON, GEORGE P. MERRILL, GERBET S. MILLER, JR., CARL W. MITMAN, ROBERT RIDGWAY, WALDO L. SCHMITT, LEONHARD STEJNEGER.

Associate curators.—J. M. ALDRICH, W. R. MAXON, CHARLES W. RICHMOND, J. N. ROSE, PAUL C. STANDLEY, DAVID WHITE.

Chief of correspondence and documents.—H. S. BRYANT.

Disbursing agent.—N. W. DORSEY.

Superintendent of buildings and labor.—J. S. GOLDSMITH.

Editor.—MARCUS BENJAMIN.

Photographer.—ARTHUR J. OLMSTED.

Property clerk.—W. A. KNOWLES.

Engineer.—C. R. DENMARK.

Shipper.—L. E. PERRY.

NATIONAL GALLERY OF ART

Director.—WILLIAM H. HOLMES.

FREER GALLERY OF ART

Curator.—JOHN ELLERTON LODGE.

Associate curator.—CARL WHITING BISHOP.

Assistant curator.—GRACE DUNHAM GUEST.

Associate.—KATHARINE NASH RHOADES.

Superintendent.—JOHN BUNDY.

BUREAU OF AMERICAN ETHNOLOGY

Chief.—J. WALTER FEWKES.

Ethnologists.—JOHN P. HARRINGTON, J. N. B. HEWITT, FRANCIS LA FLESCHÉ, TRUMAN MICHELSON, JOHN R. SWANTON.

Editor.—STANLEY SEARLES.

Librarian.—ELLA LEARY.

Illustrator.—DE LANCEY GILL.

INTERNATIONAL EXCHANGES

Assistant secretary (in charge).—C. G. ABBOT.

Chief clerk.—C. W. SHOEMAKER.

NATIONAL ZOOLOGICAL PARK

Director.—WILLIAM M. MANN.

Assistant director.—A. B. BAKER.

ASTROPHYSICAL OBSERVATORY

Director.—C. G. ABBOT.

Research assistant.—F. E. FOWLE, JR.

Research assistant.—L. B. ALDRICH.

REGIONAL BUREAU FOR THE UNITED STATES, INTERNATIONAL CATALOGUE OF SCIENTIFIC LITERATURE

Assistant in charge.—LEONARD C. GUNNELL.

ANNUAL REPORT SMITHSONIAN INSTITUTION 1927

Chief Justice, three Members of the Senate, and three Members of the House of Representatives, together with six other persons other than Members of Congress, whom shall be resident in the city of Washington, and the other four shall be inhabitants of some State, but not two of them of the same State.

REPORT
OF THE
ACTING SECRETARY OF THE SMITHSONIAN
INSTITUTION

C. G. ABBOT

FOR THE YEAR ENDING JUNE 30, 1927

To the Board of Regents of the Smithsonian Institution:

GENTLEMEN: I have the honor to submit herewith my report showing the activities and condition of the Smithsonian Institution and the Government bureaus under its administrative charge during the fiscal year ended June 30, 1927. The first 34 pages contain a summary account of the affairs of the Institution. Appendixes 1 to 10 give more detailed reports of the operations of the United States National Museum, the National Gallery of Art, the Freer Gallery of Art, the Bureau of American Ethnology, the International Exchanges, the National Zoological Park, the Astrophysical Observatory, the United States Regional Bureau of the International Catalogue of Scientific Literature, the Smithsonian library, and of the publications issued under the direction of the Institution.

THE SMITHSONIAN INSTITUTION

THE ESTABLISHMENT

The Smithsonian Institution was created by act of Congress in 1846, according to 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 affairs of the Institution are administered by a Board of Regents whose membership consists of "the Vice President, the

Chief Justice, three Members of the Senate, and three Members of the House of Representatives, together with six other persons other than Members of Congress, two of whom shall be resident in the city of Washington, and the other four shall be inhabitants of some State, but no two of them of the same State." One of the regents is elected chancellor by the board; in the past the selection has fallen upon the Vice President or the Chief Justice; and a suitable person is chosen by the regents as secretary of the Institution, who is also secretary of the Board of Regents and the executive officer directly in charge of the Institution's activities.

The following changes occurred in the personnel of the board during the year: The term as a regent of Senator George Wharton Pepper expired upon his retirement as a Member of the Senate on March 3, 1927, and Senator Joseph T. Robinson was appointed by the Vice President to succeed him on March 4, 1927. Senator Reed Smoot was reappointed a regent by the Vice President on March 4, 1927.

The roll of the regents at the close of the fiscal year was as follows: William H. Taft, Chief Justice of the United States, chancellor; Charles G. Dawes, Vice President of the United States; members from the Senate, Reed Smoot, Woodbridge N. Ferris, Joseph T. Robinson; members from the House of Representatives, Albert Johnson, R. Walton Moore, Walter H. Newton; citizen members, Charles F. Choate, jr., Massachusetts; Henry White, Washington, D. C.; Robert S. Brookings, Missouri; Irwin B. Laughlin, Pennsylvania; Frederic A. Delano, Washington, D. C.; and Dwight W. Morrow, New Jersey.

GENERAL CONSIDERATIONS

Death of Secretary Walcott.—On February 9, 1927, the fourth secretary of the Smithsonian Institution, Charles Doolittle Walcott, passed from us. For 20 years Doctor Walcott had successfully guided the destiny of the Smithsonian, and his death is a severe blow to the Institution and a great bereavement to his friends and associates on the staff. This report is not the place to review in detail the life and work of Doctor Walcott—that will be done later in a biography to be published in the general appendix to the Annual Report of the Board of Regents.

It has been my privilege to be closely associated with Doctor Walcott during the entire 20 years of his administration. He took a genuine kindly interest in his associates, rejoiced without any gesture of appropriation in their successes and the growth of their reputations, and sorrowed in their disappointments and troubles. From his long life of affairs he was always ready to quote wise or

illustrative passages, so that his counsel was most helpful and sagacious. He was highly approachable, even in temper, and exceedingly simple in all his habits. For many years he occupied a leading place in the business of his church, and he had a strong untroubled religious faith, crowned by full confidence in a future life.

Of commanding height and noble features, he was physically every inch a worthy head of the Institution. A strong and experienced administrator, of indefatigable industry, he was able not only to shape its administration but to carry on at the same time his own world-renowned researches in geology and paleontology. It has been said that 70 per cent of existing knowledge of Cambrian and Pre-Cambrian paleontology is due to him, and of this one-half was acquired by him while secretary of the Smithsonian Institution.

The late secretary was a man of the widest interests. He was prominently in public life in Washington for many years before coming to the Smithsonian, having served as director of the United States Geological Survey. At that time, also, he secured the passage of a law organizing the forest surveys of the country, and organized and directed for five years the United States Reclamation Service.

He took a leading part in the affairs of the Carnegie Institution of Washington, which he had been largely instrumental in founding, and also a leading rôle in the promotion and encouragement of the new science of aeronautics, culminating during the World War in his appointment by President Wilson as a member of the National Advisory Committee for Aeronautics. During the war he served as chairman of its executive committee and later as chairman of the committee itself until his death. He was prominent in the National Research Council, for several years president of the National Academy of Sciences, and president of other scientific societies of national scope.

One of the most important steps taken by Secretary Walcott in the last years of his administration was the approval of a definite campaign to increase the endowment funds of the Institution. This project is mentioned in his last two annual reports, that for 1926 outlining the preliminary steps taken. Although the matter has perhaps moved more slowly than anticipated, nevertheless very definite progress has been made, and there is real promise of a successful outcome of the project. Doctor Walcott, like Secretary Langley before him, regarded the totally inadequate income of the Institution for research and publication as presenting a crisis in its affairs, and it is earnestly hoped that plans for increasing that income, so vital to the future work and reputation of the Institution, may be carried on successfully.

Gifts.—Four especially noteworthy gifts and bequests came to the Institution during the past year—the Canfield mineralogical collection, the Roebling mineralogical collection, the John Donnell Smith herbarium and botanical library, and the Canu collection of French Cenozoic and Mesozoic fossils, exceeding 100,000 specimens. The Canfield collection of minerals came as a bequest from Dr. Frederick A. Canfield, of New Jersey. It contains some 9,000 minerals, many of them unique and all of exceptional quality, and to insure its continued development Doctor Canfield also bequeathed to the Institution the sum of \$50,000, the income from which is to be used for that purpose. The Roebling mineralogical collection was presented to the Smithsonian by Mr. John A. Roebling, of Bernardsville, N. J., in memory of his father, Col. Washington A. Roebling, who died in July, 1926, willing the mineral collection to his son. The Roebling collection contains over 16,000 specimens, including practically every known mineral species. Mr. Roebling also accompanied his gift with an endowment fund of \$150,000 for its development. The John Donnell Smith herbarium and botanical library form the most munificent gift of botanical material ever received by the National Herbarium. The Smith herbarium, containing well over 100,000 specimens, all well preserved and excellently mounted, is particularly rich in Central American material, with numerous type specimens of species described by Captain Smith in his own extensive botanical researches on the flora of that region.

Under the terms of the will of the late Catherine Walden Myer, and by an agreement with the other legatees named in the will, the Institution has received in cash the sum of \$3,649.91 and notes secured by certain property in Washington amounting to \$14,618. The will stipulated that the income from this bequest should be used for the purchase of works of art for use and benefit of the National Gallery of Art.

FINANCES

The permanent investments of the Institution consist of the following:

Total endowment for general or specific purposes (exclusive of Freer funds)	\$1,385,279.75
Of this total there is deposited in the Treasury of the United States as provided by law.....	1,000,000.00
Deposited in the consolidated fund:	
Miscellaneous securities, etc., either purchased or acquired by gift; cost or value at date acquired.....	373,759.75
Charles D. and Mary Vaux Walcott research fund, stock (gift); value.....	11,520.00

The sums invested for each specific fund or securities, etc., acquired by gift are described as follows:

Fund	United States Treasury	Consolidated fund	Walcott research fund	Total
Avery fund.....	\$14,000.00	\$40,456.46	-----	\$54,456.46
Virginia Purdy Bacon fund.....	-----	62,272.93	-----	62,272.93
Lucy H. Baird fund.....	-----	1,728.09	-----	1,728.09
Chamberlain fund.....	-----	35,000.00	-----	35,000.00
Habel fund.....	500.00	-----	-----	500.00
Hamilton fund.....	2,500.00	500.00	-----	3,000.00
Caroline Henry fund.....	-----	1,223.33	-----	1,223.33
Hodgkins fund:				
General.....	116,000.00	37,275.00	-----	153,275.00
Specific.....	100,000.00	-----	-----	100,000.00
Bruce Hughes fund.....	-----	14,158.90	-----	14,158.90
Lucy T. and George W. Poore fund.....	26,670.00	21,296.42	-----	47,966.42
Addison T. Reid fund.....	11,000.00	7,299.16	-----	18,299.16
Rhees fund.....	590.00	357.34	-----	947.34
Roebling fund.....	-----	150,000.00	-----	150,000.00
George H. Sanford fund.....	1,100.00	675.72	-----	1,775.72
Smithson fund.....	727,640.00	1,516.40	-----	729,156.40
Charles D. and Mary Vaux Walcott research fund.....	-----	-----	11,520.00	11,520.00
Total.....	1,000,000.00	373,759.75	11,520.00	1,385,279.75

The Institution gratefully acknowledges gifts from the following donors:

Dr. W. L. Abbott, for collecting expedition to Haiti and Santo Domingo.

Mrs. Laura Welsh Casey, further funds for expenses in connection with Casey collection of Coleoptera.

Mr. Walter Chrysler, further funds for expedition to Africa to collect animals for National Zoological Park.

Mr. Childs Frick, for explorations in vertebrate paleontology.

National Academy of Sciences, for paleontological researches.

Mrs. Cornelia Livingston Pell, for care of Pell collection.

Mr. John A. Roebling, for the establishment of the Roebling fund for care of Roebling collection of minerals, and for other purposes.

Mr. Homer E. Sargent, for manuscript on Salish basketry.

Dr. Frank Springer, further funds for publication of volume "American Silurian Crinoids," and for other purposes.

Mr. Chas. T. Simpson, for work on West Indian shells.

Mr. H. B. Swales, for purchase of specimens, etc.

The Institution has also received contributions from the following friends for the funds as listed below

Endowment campaign expense fund: Mr. Frederic A. Delano, Mr. Dwight W. Morrow, Mrs. Mary Vaux Walcott.

Endowment fund: Mr. John Baker, Mr. W. C. Condon, the Gould Co., Mr. J. Frank Haan, Mr. Paul Hartley, Mr. S. M. Henrie, Mr. George A. Knapp, Mr. W. C. Rogers, Mr. H. Seddon, and Mr. Hans Wilkens.

The Institution also received from the estate of Catherine Walden Myer the sum of \$3,649.91, a payment on account of a bequest for purchase of works of art for use and benefit of the National Gallery of Art.

Freer Gallery of Art.—The invested funds of the Freer bequest are classified as follows:¹

Court and grounds fund.....	\$365, 441. 13
Court and grounds, maintenance fund.....	78, 953. 36
Curator fund.....	316, 830. 25
Residuary legacy.....	3, 410, 655. 87
<i>Total</i>	4, 171, 880. 61

The practice of depositing on time in local trust companies and banks such revenues as may be spared temporarily has been continued during the past year, and interest on these deposits has amounted to \$3,813.38. The income during the year for current expenses, consisting of interest on permanent investments and other miscellaneous sources, amounted to \$65,392.21. Revenues and principal of funds for specific purposes, except the Freer bequest, amounted to \$320,977.75. Revenues on account of Freer bequest amounted to \$249,737.84; amount received from sale of stocks and bonds, \$1,152,735.58; aggregating a total of \$1,788,843.38.

The disbursements, described more fully in the annual report of the executive committee, were classed as follows: General objects of the Institution, \$57,518.69; for specific purposes (except the Freer bequest), \$305,220.90; and investments and expenditures pertaining to Charles L. Freer bequest, \$1,358,165.70. The total of balances on hand June 30, 1927, from all funds and mainly bearing interest on deposit, was \$202,827.49.

The following appropriations were made by Congress for the Government bureaus under the administrative charge of the Smithsonian Institution for the fiscal year 1927:

International Exchanges.....	\$46, 260
American Ethnology.....	57, 160
International Catalogue of Scientific Literature.....	7, 500
Astrophysical Observatory.....	31, 180
Additional assistant secretary.....	6, 000
National Museum:	
Furniture and fixtures.....	\$23, 730
Heating and lighting.....	78, 140
Preservation of collections.....	450, 000
Building repairs.....	12, 000
Books.....	1, 500
Postage.....	450
	565, 820
National Gallery of Art.....	29, 381
National Zoological Park.....	173, 199
Printing and binding.....	90, 000
<i>Total</i>	1, 006, 500

¹ The sinking fund has been discontinued and each fund credited with its portion of same.

EXPLORATIONS AND FIELD WORK

More than 30 field expeditions, in which the Smithsonian Institution took a leading part, went out during the past year. The record is doubly interesting, in view of the fact that almost no unrestricted funds for field work were available, each expedition being separately financed either by the generosity of some friend of the Institution or through a cooperative arrangement with some other organization whereby the costs and collections were shared. Such a program of field work is of necessity more or less haphazard, since each opportunity presented must be grasped whether or not it fulfills the exact objects most valuable to the Institution. The more desirable method, obviously, and the one that would be followed if the Institution had complete financial independence, would be to map out in advance the essential expeditions in accordance with a definite plan.

The year's field work covered such widespread territory that an enumeration of the countries visited will be of interest. Abroad, Smithsonian expeditions worked in South West Africa, East Africa, Sumatra, China, Alaska, Canada, Mexico, Guatemala, Costa Rica, Panama, Ecuador, Peru, Chile, Jamaica, Haiti, England, France, and Germany. In the United States, California, Arizona, and Florida led with three expeditions each; Washington and Louisiana followed with two each; and Montana, Wyoming, New Mexico, Mississippi, New York, and New Jersey were visited by one expedition each.

Brief extracts from accounts of only a few of the expeditions will be given here to indicate the nature of the work and its preliminary results. Accounts of other field work will be found in the reports on certain of the bureaus under administrative charge of the Institution, appended hereto, namely, the National Museum, the Bureau of American Ethnology, and the Astrophysical Observatory. The Institution also publishes each year an exploration pamphlet, giving an illustrated summary of them.

SMITHSONIAN-CHRYSLER EXPEDITION TO AFRICA

The outstanding expedition of the year in point of popular interest was the Smithsonian-Chrysler Expedition to Africa to collect live wild animals for the National Zoological Park, under Smithsonian direction. The expedition was financed by Mr. Walter P. Chrysler, automobile manufacturer, and headed by Dr. W. M. Mann, director of the National Zoological Park; the other members were Mr. Stephen Haweis, artist and naturalist; Mr. F. G. Carnochan, of New York; and Mr. Arthur Loveridge, of the Museum of Comparative Zoology at Cambridge. Mr. Charles Charlton was sent by the Pathé Review to make a motion-picture record of the expedition.

Leaving New York March 20, 1926, the party arrived in Dar-es-Salaam, Tanganyika Territory, East Africa, on May 5. A license to collect was received from the governor of the Territory and headquarters were established at Dodoma, 250 miles inland.

Collecting was successfully carried on for some months at various localities in the Territory, the animals being sent back to Dodoma to be held there until the close of the work. One of the chief desiderata was a young rhinoceros, and although adult specimens were numerous, no young were seen. In the Ja-aida swamp country, where Doctor Mann went on the search for these animals, the hunt proved rather exciting. Doctor Mann says:

Altogether we saw 22 rhinos. Our safari was charged once while on the march, and four times at night rhinos charged through our camp. But in all of these we failed to locate a single young specimen. Five different times we crawled into the scrub 30 or 40 feet from a rhino to see if it had young and were disappointed each time. One locates these rhinos, by the way, through the tick birds, which make a loud twittering at the approach of any suspicious object to the rhino on which they are clustered for the purpose of eating the ticks which are so abundant on its body. Theoretically they serve a useful purpose to the rhino by warning him of his enemies. Actually we found they were useful in leading us to where the rhino were lying, for we were attracted by the birds to each of the rhinos that we found.

The night charges are simply the result of the stupidity of the rhino. We camped usually in the vicinity of water holes, and when the nearsighted beast came to water late at night or early in the morning he would suddenly notice that there were fires and natives about. Whereupon he would put his head down and charge through in a straight line. On these occasions the natives have a frantic desire to get into the tents to be near the white men and the guns; the white men, on the other hand, have a frantic desire to get out of their tents, and the result is a collision at the entrance. Two rhinos came into our camp the same night.

At Tula, where the expedition next camped in the hope particularly of securing giraffes, animals were abundant.

Two native sultans, Chanzi and Chaduma, joined forces with us for a week, bringing with them about 500 natives. With the help of these we had the most successful trip of the expedition. Some of the boys from a mountain near by had had some experience in netting game. They make a coarse seine of native rope in sections about 5 feet high and 15 feet long. These were placed in a row, until they made about 1,000 feet of native fence, one boy hiding behind each section. The two lots of natives would double over their ends and join in a circle about a mile in circumference, then closing in toward the net. The object was to drive animals into the net, but nine times out of ten they would break through the line. Occasionally, however, they came straight on. One day a herd of over 50 impalla was surrounded. This is the most graceful antelope in Africa and a great leaper. Most of them sailed right over the net, but five fell short and we got them all. Fortune was with us as far as impalla were concerned, for it is one of the most delicate animals to handle, and yet all of ours reached Boston alive and in good condition.

Wart hogs were captured in the same way, and a troop of four were added to the collection.

Giraffes, however, proved to be very difficult to capture. A young one was finally separated from the herd and caught, but unfortunately died from pneumonia soon after. A pair was later obtained, however, from the Sudan Government. The expedition embarked from Dar-es-Salaam with about 1,700 live animals, nearly all of which were safely transported over the long journey to Washington.

This is by far the largest single collection ever brought to the National Zoological Park, and greatly increases the value and popular interest of the park's animal exhibits.

COLLECTING MICROFOSSILS IN EUROPE

Dr. R. S. Bassler, curator of paleontology in the National Museum, spent August and September, 1926, in collecting microfossils in France and Germany and in studying the geology of various classic localities in those countries. Microfossils have proved to be of the greatest value in the determination of underground geological structure, particularly in connection with the location of oil. The National Museum collections are rich in fossil micro-organisms from the American Mesozoic and Cenozoic rocks, but descriptions of many of these have never been published because their relationship to European species was not clear. To obtain the needed European material for comparison was the primary purpose of Doctor Bassler's expedition.

The first two weeks were spent in company with Dr. Ferdinand Canu, of Versailles, the most eminent student of microfossils on the Continent, who has been the joint author with Doctor Bassler of several large publications on the American fossil bryozoa. At this time Doctor Canu presented to the Museum his entire collection of French Cenozoic and Mesozoic fossils, containing at least a hundred thousand specimens fully labeled as to horizon and locality.

Doctor Bassler proceeded to the Rhine Valley, where he studied in succession the broad plain around Strassburg, the valley to Mainz, and the valley of the Main River from Mainz to Frankfort. In the Rhine gorge a first-hand knowledge was obtained of the Devonian stratigraphy of this classic area and important collections of Devonian fossils were secured.

Various regions in Germany were studied with profit both in the amount of good study material secured and in the information regarding stratigraphic relationships. The classic Mesozoic region north of the Hartz Mountains was visited in company with Mr. Ehrhard Voigt, an enthusiastic student of microfossils at Dessau, Germany. Mr. Voigt also accompanied Doctor Bassler to other regions celebrated in German stratigraphy, particularly the potash areas around Stassfurt, the drift region around Dessau, and other regions to the north, and finally to the island of Rügen on the Baltic.

At the town of Sassnitz on Rügen were located the "Kreideschlemmerei" or chalk-washing establishments. An important industry has been developed around the use of chalk for various whitening purposes, but the chalk must be pure and free from fossils and flint fragments. To accomplish this, the chalk is passed through the washers and all the fine and coarse débris is sieved out and thrown aside, leaving the water with its dissolved material to settle. In the pile of débris resulting from such washing many fossils have been discovered in this area. Not only were many excellent echinoids, brachiopods, and other large fossils picked up in the dump heap but literally billions of microfossils were obtained simply by shoveling up several boxes of the fine débris.

MINERAL COLLECTING IN MEXICO

In collaboration with the Mineralogical Museum of Harvard University, Dr. F. W. Foshag, of the National Museum, conducted field work in that part of the plateau of northern Mexico within the States of Chihuahua, Coahuila, and Durango, for the purpose of collecting representative minerals from that region. Mexico is very rich in minerals, producing, for instance, over 40 per cent of the world's silver, yet but few mineralogical collections have been made there. Doctor Foshag was in the field nearly five months, and over two tons of material was collected and shipped back to Washington. Cordial cooperation was given by Mexican Government officials and by American mining engineers in charge of the mines visited.

Some of the interesting features of the trip are described in the following extracts from Doctor Foshag's preliminary account:

Sierra Mojada, one of the districts visited, owes its discovery to a band of smugglers attempting to elude pursuit. The ore bodies extend for a distance of 6 kilometers along the foot of a limestone cliff 2,500 feet high. The district is unusual in that lead, zinc, silver, copper, and sulphur have all been mined here. The great length but shallow depth of these mines makes it more economical to work them by the old Spanish methods than by modern ones. Much of the ore is brought to the surface on the backs of peons, often up ladders made of notched logs, popularly called "chicken ladders." It is said that a strong peon will carry loads in excess of 100 kilos (220 pounds.)

In the northeastern part of the State of Durango, near the village of Mapimi, is the Ojuela mine—one of the greatest lead mines of the world. Within this one mine are over 550 miles of tunnels driven to extract the ore. The camp itself is perched on a steep limestone mountain. Before the town, rises an almost vertical cliff of Cretaceous limestone 2,000 to 3,000 feet high. It is in the hills lying at the base of this cliff that the ore bodies lie.

EXPLORING FOR FERNS IN JAMAICA

Dr. William R. Maxon, associate curator of plants, United States National Museum, spent June and July, 1926, in botanical collecting

in the Blue Mountain region of Jamaica. This expedition, made possible through the cooperation of the American Association for the Advancement of Science, the New York Botanical Garden, and the United Fruit Co., had for its specific object the collecting of material needed in the preparation of an account of the ferns of Jamaica. The importance of this study is thus explained by Doctor Maxon:

The ferns of Jamaica were among the first to be described from the New World, but in many instances the names originally given them came later to be applied loosely to related but distinct kinds from other regions, with much resulting confusion. To afford a proper basis for studying the diverse fern floras of tropical America as a whole, it thus becomes of prime importance to know thoroughly that of Jamaica, an end that can be attained, naturally, only with the aid of adequate material.

Of the 500 species of ferns and fern allies described or known from Jamaica, nearly all are found in recent large collections brought to American herbaria from that island; yet there are a few collected by Sir Hans Sloane in the latter part of the seventeenth century, and by Swartz about a hundred years later, that still are known only from the original specimens preserved in European museums. Present field work is concerned therefore in the re-discovery of these "lost" species and of other very rare ones described more recently, but equally also in the discovery of new kinds, and in assembling data as to the distribution, characteristic habitats, habits of growth, and interrelationship of those other species that are comparatively well known.

In all, some 15,000 specimens were collected, which will be of the greatest assistance in the preparation of the proposed monograph of the ferns of Jamaica.

ARCHEOLOGICAL WORK IN CHINA

An archeological survey of the Fêng River Valley, southern Shansi, China, was carried out in the early part of 1926 by Dr. Chi Li, of the Freer Gallery of Art Expedition to China. Carrying letters of introduction to the governor of Shansi, and other influential officials, and accompanied by Mr. P. L. Yüan, of the Geological Survey of China, Dr. Chi Li began his trip at T'ai-yüan.

Ancient temples, embellished with iron and stone images, tombs of emperors whose deeds are lost in the haze of tradition, and mounds of prehistoric potteries were found, all of which promise a rich field to the archeologist. An excerpt from Doctor Li's report gives something of the fascinating interest of the exploration.

On the 19th we set out to visit the supposed tomb of the Emperor Shun, and on the way stopped at certain temples in Yün-ch'êng. In *Shansi-t'ung-chih*, it is recorded that the stone pillars of these temples were formerly the palace pillars of Wei Hui-wang (335-370 A. D.), recovered from the ruined city south of An-i Hsien. Some of them are now used as the entrance pillars in Ch'ên-huang Miao and Hou-t'u Miao, and those of Ch'ên-huang Miao certainly

show peculiar features which are worth recording. Two pillars, hexagonal in section and carved with dragons coiled around them, are found at the entrance. The left one is especially interesting, because in the claws of the dragon are grasped two human heads with perfect Grecian features—curly hair, aquiline and finely chiseled nose, small mouth, and receding cheeks. One head with the tongue sticking out is held at the mouth of the dragon, while the other is held in the talons of one hind leg. It is an unusually fine piece of sculpture in limestone, wonderfully spaced and with the most graceful lines. The right one is inferior in its workmanship; evidently the two were not executed by the same hand. I saw 28 of this kind of pillar in the succeeding two days, but most of them were crude imitations. It is possible, however, that some are of the ancient type and were made earlier than others. The whole subject is well worth more detailed study.

ANTHROPOLOGICAL SURVEY OF ALASKA

A reconnaissance of anthropological and archeological matters in Alaska was undertaken during the spring and summer of 1926 by Dr. Aleš Hrdlička, curator of physical anthropology in the National Museum, under the auspices of the Bureau of American Ethnology. An archeological reconnaissance of Alaska presents many difficulties. Although Alaska is as large as one-third of the United States, it has less than 200 miles of good roads; the interior is practically impassable except for short stretches during the brief summer; and transportation by boat is very hard to obtain and very expensive. The people of Alaska, however, were found to be most helpful and generous, and with their help Doctor Hrdlička was able to overcome many of the difficulties encountered. When the Bering Sea was reached, he was fortunate enough to find the revenue cutter *Bear* willing to help, and on it he was enabled to inspect the sites of archeological interest along the Seward Peninsula, the Kotzebue Sound, and through the Arctic Sea up to Barrow.

The journey led from Vancouver to Juneau, thence to Seward, Anchorage, Eklutney, Nenana, and Tananá. From here the route led inland from the junction of the Tananá to the mouth of the Yukon, concluding with the voyage in Bering Sea.

Doctor Hrdlička collected many artifacts of metal, bone, and ivory, examined skeletal remains in many old burial places, examined the differentiation between Eskimo and Indian in physical and cultural characters, and observed the conditions governing the possibilities of the Mongoloid migrations through Bering Sea, which are supposed to have populated the Americas. He was convinced that such migrations were so easy as to have been indeed inevitable, and that the Eskimo and Indian races trace from a common Mongoloid stem, having its American dispersal from the Alaskan peninsula. The ancient Alaskan artifacts discovered point to a high grade of native art, almost on a par with the high cultures of Mexico, Yucatan, and Peru.

CONFERENCE ON THE FUTURE OF THE INSTITUTION

An outstanding event in the history of the Institution was the conference held at the Smithsonian on February 11, 1927, to advise with reference to the future policy and field of service of the Institution. The President, the Vice President, members of the Cabinet, and a group of the foremost American scientists and industrial leaders met under the chairmanship of Chief Justice William Howard Taft to hear addresses on the past record and present great possibilities of the Institution, to inspect a specially arranged exhibit in the main hall of the Smithsonian Building, showing the nature and scope of the researches and publications at present under way, and to discuss informally the most promising directions for the future work of the Smithsonian.

The chancellor, Chief Justice Taft, in opening the conference, reviewed briefly the history of the Institution from 1826, the date of the making of Smithson's will, emphasizing the basic soundness of the charter provided by Congress after eight years of deliberation. But this charter alone did not make the Smithsonian the leader of American science in its early years and a world-renowned agency for the increase and diffusion of knowledge to the present day. The plan of organization outlined and put into effect by the first secretary, Joseph Henry, did that. His plan has proved to be so wise and fruitful of great results that it has never been found necessary to alter it materially. Mr. Taft also emphasized the fact that the Smithsonian Institution is not and has never been properly considered a Government Bureau, this popular misconception having arisen from the fact that the Institution still administers for the Government seven of the public bureaus, which arose from its early activities. Mr. Taft concluded his address thus:

Joseph Henry had the vision to understand clearly what Smithson meant his foundation to be, and the energy and character to make it that. The Smithsonian has now come to a time when, without the support of the Nation, it can no longer continue to be what Henry made it. And yet the need for just such an Institution as it has been is no less than the need was 80 years ago. In some respects the unique opportunities are even greater. This Institution is not the product of a moment; 80 years of the toil of great men have gone into its making. There is that about it which can not be replaced.

The regents have felt it their duty to reveal to a leading group of representative American citizens what it is and does, and to advise with them what its future shall be. For that reason they have invited you here. They wish you to see the broad and comprehensive scope of the Institution, competing or interfering with nobody, cooperating with all, reaching the basic problems of mankind and of the time, with a view to furnishing the information through which alone they can be solved. They wish you to see what the future possibilities of the Institution are, and if you think them worthy of realization, to advise us as to how we may go about achieving it.

Following the chancellor's address, Doctor Abbot, as acting secretary, spoke on "The Smithsonian Institution—Its Activities and Capacities." Reviewing the origin and growth of the Government bureaus which by direction of Congress remain under Smithsonian direction, he showed how they arose from private Smithsonian initiative, and continued at private Smithsonian cost until they became large public necessities. The activities of the Institution, past and present, were brought together under 13 heads, as follows:

1. It carries on original scientific investigations with its own staff.
2. The Institution subsidizes other researches by men not directly connected with the Institution.
3. It publishes new knowledge, gained by its own and outside workers, in the form of large memoirs and smaller original papers, which it distributes free to 1,500 libraries and learned bodies in every country of the world.
4. The Smithsonian evolved the International Exchange Service and is now the official channel for the exchange of scientific intelligence between the United States and the world.
5. For over half a century the Institution has been building up in the Library of Congress the foremost scientific library in this country, now totaling nearly 700,000 volumes.
6. It fosters the scientific development of schools, museums, and institutions through its free distribution of scientific literature, by the loan of research men, by the gift of over a million specimens, by the distribution of instruments, and by its advice.
7. The Institution cooperates with every department of our Government.
8. It answers by mail an average of 8,000 questions a year on scientific subjects.
9. It gives occasional lectures and courses of lectures and radio talks.
10. It fosters research by conferring medals of honor on eminent discoverers.
11. It procures foreign diplomatic and learned recognition and assistance to expeditions going abroad.
12. It fosters American scientific progress by providing headquarters for the American Association for the Advancement of Science and the American Association of Museums.
13. It administers seven governmental bureaus in addition to the Freer Gallery.

The acting secretary next presented in some detail the wonderful opportunities ahead of the Institution in many lines of scientific research, using as a concrete example his own field of investigation, namely, astrophysics. He stated that there was a vast deal

not yet known about the rays of the sun, which support all life, make all weather, and directly or indirectly supply all power. Knowledge of four things about the sun is particularly needed at the present time:

1. Which rays are best for human health and growth, and at what intensity? How do these intensities change by day, by year, by altitude, and by latitude? Physicians come to the Smithsonian now for information on the influence of sun rays on child health. We can not give them the answer, nor can anyone else, because the investigations have not been made.

2. What rays and in what intensity promote growth and reproduction in the great food and otherwise commercially valuable plants? Are useful modifications of these plants possible by the regulation of radiation? How do plants use solar energy to make chemical energy, and can we improve upon their processes and accomplish photosynthesis directly?

3. Can solar rays advantageously be used directly for power?

4. Can studies of solar variation foretell good and bad weather conditions?

The Smithsonian is particularly fitted through its long experience and trained personnel to attack fundamental problems, and is only restrained from doing so by lack of funds. Examples might be cited for nearly every branch of science.

The acting secretary concluded his address by calling attention to the fact that private endowment is essential for a continuous program of pure science research, and to the unique strategical position of the Institution for the most effective increase and diffusion of knowledge.

After an address by Frederic A. Delano, Regent of the Institution, emphasizing the great opportunity before the Smithsonian of becoming the motivating head of all governmental, quasi governmental, and private research work in the field of pure science, and an introduction to the special exhibits by Assistant Secretary Alexander Wetmore, the conference viewed the exhibits grouped around the main hall. These dealt with the present work of the Institution in anthropology, geology and paleontology, biology, and astrophysics, and also illustrated its activities in the diffusion of knowledge through its publications, its scientific library, its International Exchange Service, and the International Catalogue of Scientific Literature.

After a luncheon for the conferees, which was attended by the President of the United States, an informal discussion was held on the main purpose of the conference, "to advise with reference to the future policy and field of service of the Smithsonian Institution." The chancellor, Mr. Chief Justice Taft, as chairman, turned the direction of the discussion over to Mr. Dwight W. Morrow, regent of the Institution, who in turn called upon a few of the distinguished guests to comment upon the past or the present or the future of the Institution. The speakers included Dr. John C. Merriam, president of the Carnegie Institution of Washington; Dr. William Henry Welch,

director emeritus of the School of Hygiene and Public Health of Johns Hopkins University; Dr. S. W. Stratton, president of the Massachusetts Institute of Technology; Dr. Simon Flexner, director of the Rockefeller Institute for Medical Research; Dr. W. W. Campbell, president of the University of California; Dr. Henry Fairfield Osborn, president of the American Museum of Natural History; Dr. George E. Vincent, president of the Rockefeller Foundation; Mr. Chauncey J. Hamlin, president of the American Association of Museums; Gen. H. M. Lord, Director of the Bureau of the Budget; and Senator Reed Smoot.

The very definite concensus of opinion was apparent from the discussion that the Smithsonian Institution has a most important place to fill in future as the inspirer and coordinator of research in pure science as it had been in the past, and that both governmental and private support should unite in making available more adequate means to enable it to carry on that worthy mission. Chairman Morrow, in closing the discussion, said in part:

I have been deeply impressed with this meeting. I, like Doctor Flexner, have learned much about the Smithsonian to-day. It is a great honor to be associated in any way with such an institution. It is a great honor to those of us on the Board of Regents to have so many distinguished men respond to our invitation to advise with us with reference to the future policy and field of service of an institution which has had so honorable a past. We are particularly grateful to those of you who have taken part in the discussion.

In the course of the conference there has been some discussion of the funds available to the Smithsonian from the Government for those bureaus which are administered by the Smithsonian and those funds available from the original endowment of the Smithsonian. I am sure that General Lord is correct when he tells us that there has been a greater percentage of increase in the Government appropriations for the bureaus administered by the Smithsonian than for the other Government bureaus. We must all remember, however, the point that Doctor Merriam brought out when he referred very beautifully to the work designed to be done by the original Smithsonian Foundation as the "holy of holies." This "holy of holies" remains pretty much as it was when John Quincy Adams induced Congress to grant the charter which makes the work of James Smithson go on. * * *

Now, when one thinks of the splendid history of the Smithsonian Institution, when we think of what devoted men have been doing and are doing upon inadequate salaries, it seems to me that the only way to resolve this dispute as to whether the Smithsonian Institution should be supported by the Government or supported by private benefactions is to get the Government and the private benefactors into such a state of mind that they will vie with each other, the benefactors insisting that they should do it all and the Government insisting that they should do it all.

And in saying good-bye to you, I should like to leave a text in your mind. * * * You will find the text in one of the earlier chapters of Deuteronomy. It reads like this:

"Thou shalt not muzzle the ox when he treadeth out the corn."

That was a practical injunction to a practical people. The ox, who was doing a real work, should not be muzzled. I offer no apology to the devoted

men who have been rendering this Institution service in comparing them to the ox. The ox has a very ancient and a very honorable lineage. If the historians are correct, the ox, as a bearer of burdens, goes back much further than the horse. The ox is perhaps the most ancient burden bearer for mankind. And the devoted men that have been running this institution, what have they been doing? They, too, have been bearing the burdens of mankind, the burdens of the future generations of men.

"Thou shalt not muzzle the ox when he treadeth out the corn."

AWARD OF LANGLEY MEDAL TO COL. CHARLES A. LINDBERGH

The Langley medal of the Smithsonian Institution has been awarded only four times since its establishment. The first three awards were to Wilbur and Orville Wright, to Glenn H. Curtiss, and to Gustave Eiffel, and on June 11, 1927, the fourth award was made, this time to Col. Charles A. Lindbergh for his magnificent nonstop flight from New York to Paris. It thus continues to be characteristically a medal for pioneers in aeronautics. The award was voted to Colonel Lindbergh by the Board of Regents upon the recommendation of a committee of leading aeronautical authorities, and the official notification was made to him in person by the acting secretary at the National Press Club reception in the Washington Auditorium. He said:

The Smithsonian Institution knows how to appreciate the pioneering work of brave men. You will recall, as a single example, our honored one-armed hero, Major Powell, who dared for science the first passage of the uncharted raging waters of the Grand Canyon of the Colorado, strapped in his boat. We are not less stirred to admiration by your own daring in the first nonstop flight from New York to Paris over the boisterous Atlantic through icy clouds that threatened death.

Nor is the Institution failing to appreciate, sir, the precious results in the encouragement of aviation, in the strengthening of ties of international friendship, and in the progress of science, which have already begun to flow from your achievement.

The Smithsonian has in its gift a medal which commemorates the name of Samuel Pierpont Langley, the third secretary of this Institution. He had the audacity to believe in the practicability of the art of flying when all men were ridiculing it; and he adventured his own high reputation as a man of science to lay the groundwork of exact experiments, and to make pioneering flights of large models, which demonstrated the soundness of his faith. The Langley medal has hitherto been presented to Wilbur and Orville Wright, to Glenn H. Curtiss, and to Gustave Eiffel. Thus it is from all points of view the medal of pioneers. It is highly fitting that it should now be awarded to you, sir, the pioneer of audacious, solitary flight to distant shores.

Therefore, acting on the unanimous recommendation of an eminent committee of award, the regents of the Smithsonian Institution have voted to you the Langley medal, and have recorded their action in this paper signed by the chancellor, Mr. Chief Justice Taft, which I now present to you.

The actual medal, in gold, is being struck in Paris. I hope that when it is received you may do the Institution the honor to appear on some suitable occasion and receive it in person.

ANNOUNCEMENT OF AWARD BY THE BOARD OF REGENTS

JUNE 4, 1927.

The Langley medal of the Smithsonian Institution was established by the Board of Regents in 1908 as a tribute to the memory of the late Secretary Samuel Pierpont Langley and his contributions to the science of aerodromics.

This medal has been awarded—

To Wilbur and Orville Wright on February 10, 1909, "for advancing the science of aerodromics in its application to aviation by their successful investigations and demonstrations of the practicability of mechanical flight by man";

To Glenn H. Curtiss on February 13, 1913, "for advancing the art of aerodromics by his successful development of a hydroaerodrome whereby the safety of the aviator has been greatly enhanced";

To Gustave Eiffel, of Paris, on February 13, 1913, "for advancing the science of aerodromics by his researches relating to the resistance of the air in connection with aviation."

Believing that the achievements of Capt. Charles A. Lindbergh entitled him to consideration as a recipient of this medal, the acting secretary of the Institution appointed a committee, which has made the following report:

THE JOHNS HOPKINS UNIVERSITY,
Baltimore, Md., June 3, 1927.

THE BOARD OF REGENTS, SMITHSONIAN INSTITUTION,
Washington, D. C.

GENTLEMEN: The committee designated by the Acting Secretary of the Smithsonian Institution, consisting of Dr. Joseph S. Ames, chairman; Admiral D. W. Taylor, Dr. S. W. Stratton, and Admiral H. I. Cone, to consider the award of the Langley medal at this time has unanimously voted that Capt. Charles A. Lindbergh, for his magnificent nonstop flight from New York to Paris, is justly entitled to receive this medal, and recommends that it be awarded to him by the Board of Regents of the Smithsonian Institution.

Very truly yours,

(Signed) JOSEPH S. AMES, *Chairman.*

The Board of Regents has approved the above recommendation of the committee, and I take pleasure in announcing that the Langley medal of the Smithsonian Institution is hereby awarded to Capt. Charles A. Lindbergh for his flight from New York to Paris, made on May 20 and 21, 1927.

WM. H. TAFT,
Chancellor, Smithsonian Institution.

By the Chancellor:

C. G. ABBOT, *Acting Secretary.*

SMITHSONIAN RADIO TALKS

The series of Smithsonian radio talks over station WRC of the Radio Corporation of America, begun in 1923, continued during the year with undiminished popularity. As in previous years, the program was under the direction of Mr. Austin H. Clark. This is obviously an effective method of diffusing knowledge of scientific matters, one of the primary functions of the Institution. An increasing number of the talks have been published as magazine or newspaper articles, thus insuring their permanent preservation. Because

of the increasing demands on the time of station WRC, it became necessary to include the talks on the National Zoological Park, given last year as a distinct series, in the regular series of Smithsonian talks. During the Smithsonian-Chrysler Expedition to Africa, under the direction of Dr. W. M. Mann, letters from Doctor Mann were read over WRC to keep the public informed of the progress of the expedition. Twenty-nine talks were presented between November 24, 1926, and June 29, 1927, as follows:

November 24, 1926: Bringing Home Living Animals from Africa. Dr. William M. Mann, Director, National Zoological Park.

December 1, 1926: Early American Animals—Elephants and Others. Dr. James W. Gidley, National Museum.

December 8, 1926: Shooting Stars. Dr. Willard J. Fisher, Harvard College Observatory (read by Mr. Austin H. Clark).

December 15, 1926: An Observatory Among the Hottentots. Dr. Charles G. Abbot, assistant secretary, Smithsonian Institution.

December 22, 1926: The Invasion of the Snowy Owl. Dr. Alexander Wetmore, assistant secretary, Smithsonian Institution.

January 5, 1927: Natural History in Louisiana. Mr. Percy Vicsca, jr., State biologist of Louisiana.

January 19, 1927: Dialogue between Miss Sarah W. Clark and Dr. William M. Mann on the subject of his experiences in Africa.

January 26, 1927: The Antarctic Continent. Prof. Sir Douglas Mawson, the University, Adelaide, South Australia.

February 2, 1927: Some African Reptiles. Miss Doris M. Cochran, National Museum.

February 9, 1927: White Ants or Termites. Dr. Thomas E. Snyder, Bureau of Entomology.

February 23, 1927: The Romance of the Lighthouse Service. Mr. John S. Conway, Deputy Commissioner of Lighthouses.

March 2, 1927: Oyster Farming. Mr. Herbert F. Prytherch, Bureau of Fisheries.

March 7, 1927: American Wild Horses. Dr. James W. Gidley, National Museum.

March 16, 1927: Fishery Products in the Arts and Industries. Mr. Lewis Radcliff, Deputy Commissioner of Fisheries.

March 21, 1927: Beetles; what they are and what they do. Dr. Edward A. Chapin, Bureau of Entomology.

March 28, 1927: Watchmakers as Inventors. Mr. Carl W. Mitman, National Museum.

April 6, 1927: The Study of the Sun. Mr. F. E. Fowle, Astrophysical Observatory.

April 13, 1927: The Sea. Mr. Austin H. Clark, Smithsonian Institution.

April 20, 1927: Frogs and Toads. Miss Doris M. Cochran, National Museum.

April 27, 1927: The Honey Bee. Mr. James I. Hambleton, Bureau of Entomology.

May 4, 1927: Mice. Mr. Arthur J. Poole, National Museum.

May 11, 1927: Fossil Footprints in the Grand Canyon. Mr. Charles W. Gilmore, National Museum.

May 18, 1927: Who owns Potomac Park? Dr. George P. Merrill, National Museum.

May 25, 1927: Museums. Mr. Chauncey J. Hamlin, president, American Association of Museums.

June 1, 1927: The Black Hills of South Dakota. Dr. James W. Gidley, National Museum.

June 8, 1927: Goldfish and Other Aquarium Creatures. Mr. Glen C. Leach, Bureau of Fisheries.

June 15, 1927: Snakes. Mr. Charles S. East, National Museum.

June 22, 1927: The Gold Coast. Mr. Charles H. Knowles, director of agriculture, Accra, Gold Coast.

June 29, 1927: The coins of Asia. Mr. T. T. Belote, National Museum.

PUBLICATIONS

The 12 series of publications issued by the Institution and its branches constitute a chief means of diffusing knowledge, correspondence, exhibitions, and lectures supplementing. The first secretary of the Smithsonian, Joseph Henry, said:

It is chiefly by the publications of the Institution that its fame is to be spread through the world, and the monument most befitting the name of Smithson erected to his memory.

These publications cover nearly every branch of science, although anthropology, biology, geology, and astrophysics have predominated. As most of the publications present the results of research in pure science, the great majority are naturally technical in character. Two annual publications, however, are intended for the general reader—the Smithsonian annual report and the Smithsonian exploration pamphlet.

The Smithsonian annual report has from the first been enriched with a general appendix made up of a selection of some 30 articles reviewing in nontechnical language recent advances in all branches of science and interesting phases of modern research work. Many of the articles are reprinted from journals which have little or no circulation in this country, and would therefore otherwise probably never be seen by American readers. The following eight titles selected at random from the 30 articles in the general appendix to the 1926 report, which will appear early in the coming autumn, will indicate the character of these papers:

Influences of sun rays on plants and animals.

Excursions on the planets.

Cold light.

The cause of earthquakes; especially those of the eastern United States.

How beavers build their houses.

Fragrant butterflies.

Omaha bow and arrow makers.

Preventive medicine.

Ten thousand copies are printed of the reports and they are distributed free as long as the Institution's quota lasts. The annual Smithsonian exploration pamphlet is a profusely illustrated account of the field expeditions in which the Institution took part during the year. Many of the pictures are extremely interesting, forming a first-hand record of the natural conditions and human activities in far-off parts of the earth. The exploration pamphlet for 1926, issued in April, 1927, described 35 separate expeditions, many of them to remote regions such as South West Africa, East Africa, China, Sumatra, Siam, and the interior of Alaska.

One hundred and eighteen volumes and pamphlets were published during the past year by the Institution and the Government bureaus under its direction. Of these there were distributed a total of 182,846 copies, which included 24,775 volumes and separates of the Smithsonian annual reports, 18,199 volumes and separates of the Smithsonian miscellaneous collections, 17,178 Smithsonian special publications, 110,580 publications of the National Museum, and 10,711 publications of the Bureau of American Ethnology. The titles of the individual papers are listed in the report of the editor of the Institution.

Allotments for printing.—The congressional allotments for the printing of the Smithsonian report to Congress and the various publications of the Government bureaus under the administration of the Institution were practically used up at the close of the year. The appropriation for the coming year ending June 30, 1928, totals \$90,000, allotted as follows:

Annual report to the Congress of the Board of Regents of the Smithsonian Institution.....	\$10, 500
National Museum.....	44, 000
Bureau of American Ethnology.....	26, 800
National Gallery of Art.....	500
International Exchanges.....	300
International Catalogue of Scientific Literature.....	100
National Zoological Park.....	300
Astrophysical Observatory.....	500
Annual report of the American Historical Association.....	7, 000

Committee on printing and publication.—All manuscripts submitted to the Institution for publication either by members of the staff or by outside authors are referred for consideration and recommendation to the Smithsonian advisory committee on printing and publication. The committee also considers matters of publication policy. During the past year five meetings were held and 83 manuscripts were considered and acted upon. The membership of the committee is as follows: Dr. Leonhard Stejneger, head curator of biology, National Museum, chairman; Dr. George P. Merrill, head

curator of geology, National Museum; Dr. J. Walter Fewkes, chief, Bureau of American Ethnology; Dr. William M. Mann, director, National Zoological Park; Mr. W. P. True, editor of the Institution, secretary; Dr. Marcus Benjamin, editor of the National Museum; and Mr. Stanley Searles, editor of the Bureau of American Ethnology.

LIBRARY

The accessions to the libraries of the Institution and its branches, exclusive of the Bureau of American Ethnology, totaled 9,060. The outstanding gift of the year was the John Donnell Smith botanical collection of 1,600 volumes, which will be deposited in the section of botany of the United States National Museum. This library was really presented to the Institution in 1905, but until last year only a part of it had been transferred to Washington. A catalogue of the collection was published by the Institution in 1908.

Decided progress was made during the year on the union dictionary catalogue, especially in connection with the library of the Astrophysical Observatory. This catalogue is designed eventually to include the titles in all the divisions of the Smithsonian library. Efforts to complete broken sets were continued with excellent results, thousands of volumes and parts of volumes being received from the duplicate collection in the Library of Congress and from learned institutions and societies the world over. The aeronautical library was made a distinct division of the Smithsonian library during the year, and was officially designated the Langley Aeronautical Library, in honor of Samuel Pierpont Langley, third secretary of the Smithsonian. Nearly 2,000 volumes were prepared for binding. Material was lent on a semipermanent basis, as usual, to research institutions, to aid special work. The most conspicuous loan of this nature was made to the Johns Hopkins University. Other loans of particular interest were made to the University of Wisconsin and the California Academy of Sciences.

NATIONAL MUSEUM

The congressional appropriations for the support of the National Museum totaled \$609,320, an increase of \$10,928 over last year. This increase was of material assistance in the regular work, but larger appropriations are essential to a fair realization of the Museum's possibilities. The amounts granted annually are so nearly used up in necessary routine expenditures that little remains for exploration and field work, a vital activity in the proper and balanced development of the Museum. Many opportunities to acquire valuable and unique specimens, which could be obtained with comparatively little expense, are lost each year through lack of an adequate margin of funds to

cover such cases. This need is the greater since the continual encroachment of civilization on natural features of the earth is rapidly bringing about the extermination of many living forms and the destruction of natural formations. Additional funds are needed also for a larger scientific staff. Many extensive collections are now without curators, and in many divisions there should be younger men in training to take the places of those grown old in the service of the Museum. Increases in compensation for the entire staff should also be provided, as the annual efficiency surveys indicate that the majority of the employees are entitled to increases for which at present no funds are available.

The Museum received during the year a larger number of additions to the collections than in any previous year, the total number of new specimens reaching 402,531. The Museum presented to schools 3,717 specimens during the year, 31,747 duplicates were sent out in exchange, and 25,000 specimens were loaned to specialists for study. The year's important accessions are listed in the report of the assistant secretary in charge of the Museum, which forms Appendix 1 of this report. I will mention here but a few of the most interesting additions.

In anthropology there was received the very important collection resulting from Mr. M. W. Stirling's expedition to the interior of Dutch New Guinea, containing much material previously unknown to science. Gen. Tasker H. Bliss presented several hundred specimens of costumes, weapons, weaving, and other native arts from the Philippines. A large collection of pottery and other material resulting from Mr. N. M. Judd's excavations at Pueblo Bonito, N. Mex., was presented by the National Geographic Society. Much valuable material was added to the anthropological collections through the work of the Bureau of American Ethnology, notably that of Dr. J. Walter Fewkes at Eldon Pueblo in Arizona, Dr. Aleš Hrdlička in Alaska, Mr. H. W. Krieger on the upper Columbia River, and Mr. H. B. Collins, jr., in Louisiana and Mississippi.

The department of biology received a large number of important collections, including Siamese mammals, birds, and other forms from Dr. Hugh M. Smith, a large collection of crustaceans from South America gathered by Dr. Waldo L. Schmitt, two important collections of insects from Mr. John D. Sherman and Dr. William Schaus, and zoological material from A. de C. Sowerby working under the auspices of Col. R. S. Clark. Mr. B. H. Swales and Dr. C. W. Richmond each presented valuable collections of birds containing a number of forms new to the Museum, and Capt. R. A. Bartlett donated over 700 specimens of marine invertebrates from Greenland. The botanical collections were enriched by the great gift of Capt. John Donnell Smith, already mentioned, by 11,000 Jamaican plants,

chiefly ferns, collected by Dr. W. R. Maxon, and 9,500 plants from Colombia, collected by E. P. Killip and Albert C. Smith.

Of primary importance among the year's additions to the department of geology are the Washington A. Roebling and the Frederick A. Canfield mineral collections, already mentioned. Exceptionally fine specimens of minerals and ores from Mexico resulted from Dr. W. F. Foshag's expedition to that country. Thirty-five specimens were added to the meteorite section, nine of them new to the collection. The most important accession to the division of stratigraphic paleontology was the collection of 100,000 Mesozoic and Cenozoic fossils from Europe, presented by Ferdinand Canu, of Versailles, France. A partial skeleton of a mammoth was presented by the Venice Co., of Venice, Fla.

The collections of the arts and industries department were increased by over 14,000 specimens. The division of mineral and mechanical technology received an important exhibit illustrating the manufacture of artificial abrasive wheels, a large collection of Patent Office models transferred from the Department of Commerce, and as an addition to the aircraft exhibits, the Navy seaplane NC-4. The textile collections were increased by gifts of silks from H. R. Mallinson & Co. (Inc.), 200 hides, skins, and leather products from the Tanners' Council of America, and a collection of footwear used by different peoples, assembled by the late Frank G. Carpenter and presented by his daughter, Mrs. William Chapin Huntington. The divisions of medicine, wood technology, and graphic arts each received important new material, and the Loeb collection of chemical types accessioned 175 specimens of rare chemicals. The division of history received three fragments belonging with the original Star Spangled Banner, and a white satin evening dress worn by Mrs. Calvin Coolidge in the White House, for addition to the exhibit of costumes of the wives of the Presidents.

The Museum was unusually active in exploration during the past year, many field expeditions having gone out either by means of cooperative arrangements with other organizations or with funds supplied by friends of the Smithsonian. These expeditions will be found briefly described in the Museum report, Appendix 1. The usual large number of meetings and lectures were held in the auditorium and lecture rooms of the Museum. The exhibit of the Smithsonian Institution at the Sesquicentennial in Philadelphia, including that of the Museum, was shown until the close of the exposition on November 30. The exhibits were very favorably received by the public. At the conference held on February 11, 1927, in the Smithsonian Building, the research work of the Museum was represented by specially prepared exhibits. Visitors to all of the

Smithsonian and Museum buildings totaled 1,153,212 for the year, an increase of 50,000 over the preceding year. Ten volumes and 63 separate papers were published during the year, and 110,580 copies of Museum publications were distributed.

NATIONAL GALLERY OF ART

Although the year has been marked by numerous features and events of interest, the two great lines of prospective development have remained practically dormant—these are the erection of a gallery building and the enhancement of the collections by gift and bequest. The meagerness of the offerings of art works is doubtless due in large measure to the well-known fact that exhibition space in the National Museum is entirely exhausted.

The sixth annual meeting of the National Gallery of Art Commission was held at the Smithsonian Institution on December 7, 1926. After the presentation of the annual report on the gallery's activities by the secretary of the commission, a resolution was adopted favoring the establishment of a national portrait gallery, with the present collection of war portraits as a nucleus, to form a unit of the National Gallery of Art. The commission then recommended to the Board of Regents the election of Clarence C. Zantzing, of Philadelphia, to fill a vacancy on the commission. The acceptance of art works offered to the gallery during the year was then considered.

Four special exhibitions were held in the gallery during the year, as follows: 36 oil paintings of Venice, by Herbert Waldron Faulkner; 49 oil paintings and 14 drawings in pen and pencil, by John Ross Key; 20 portrait drawings in red chalk of members of the Lafayette Escadrille, by John Elliott; and an architectural model of an oriental temple, designed and executed by Charles Mason Remey.

Purchases of paintings from the Henry Ward Ranger fund were three in number—"Still Life," by Frank W. Benson; "Woodland Nymph," by Douglas Volk; and "Man in White," by Cecilia Beaux. These were assigned to various institutions and may later be reclaimed by the National Gallery under certain conditions.

The gallery accepted a number of loans of art works during the year and several loaned in previous years were recalled by the owners.

FREER GALLERY OF ART

Additions to the collection include several pieces of ancient Persian pottery, a thirteenth century Persian painting, and a black schist image of the Indian god Visnu. During the year 123 objects were

submitted for expert opinion or for translations of their inscriptions, besides several Chinese and Japanese texts sent for translation.

The most important work in the preservation of the collection consisted in reconditioning the ceiling of the Peacock Room. The library was increased by the addition of 37 books, 28 periodicals, and 151 pamphlets.

The total attendance for the year was 110,753. Of this number, 367 came for special study in the library and storage rooms. Over a thousand photographs and as many gallery publications were sold during the year. Special mention should be made of the Biblical manuscripts in the possession of the gallery, photographs of which can be obtained on order.

In the field the most important single undertaking was the preliminary excavation, under the supervision of Dr. Chi Li, of a prehistoric site in Shansi Province, China, from which a large amount of valuable material was recovered. A full report of this work is being prepared.

BUREAU OF AMERICAN ETHNOLOGY

The bureau has continued its ethnological researches among the American Indians and the excavation and preservation of prehistoric Indian structures as authorized by act of Congress. In addition it has furnished information on anthropological and archeological subjects to an ever-increasing circle of correspondents. Dr. J. Walter Fewkes, chief of the bureau, continued his systematic researches at Elden Pueblo in Arizona, referred to in last year's report. This interesting ruin is the largest in the Flagstaff region and is closely allied both in masonry and ceramics with the little-known cliff ruins in northern Arizona and the open-air pueblos near St. George, Utah. In the cemeteries east and north of the ruin many skeletons were found, those buried the deepest being surrounded with pottery antedating the glazed pottery of Arizona, including a large number of bright-red bowls with burnished black interiors resembling the ware of the lower Gila and California. A large collection of this pre-Puebloan material was made and is now in the National Museum.

In June, 1927, the chief made a short reconnoissance in the neighborhood of Greenville, S. C., which convinced him that the archeology of the region is complex and would well repay investigation. He selected a site for future exploration and examined several fine collections containing objects of pottery, stone, and clay that have never been figured or described. He obtained photographs of several unique specimens.

Dr. John R. Swanton was engaged during the past fiscal year in the preparation of a bulletin on "The Social and Religious Usages of the Chickasaw Indians," and a similar paper relating to the Choctaw. He also completed a card catalogue of the Timucua words used in the printed works of Pareja and Morvilla.

Dr. Truman Michelson continued his researches among the Algonquian tribes, beginning with the Arapaho of Wyoming, where his work brought out clearly the divergent character of their language as compared with other Algonquian tongues. In Chicago he took the important measurements of all the Blackfoot (Siksika) crania preserved in the Field Museum of Natural History. These measurements, combined with those of material already in the National Museum, should permit the determination of a number of disputed points. In Washington Doctor Michelson prepared for publication by the bureau a paper entitled "Notes on the Buffalo Dance of the Thunder Gens of the Fox Indians" and three new Fox texts.

Mr. John P. Harrington spent the year in the Chumash region of southern California. The Chumash Indians are rapidly taking up the life and language of the whites, and the gathering of information about them is urgent. Mr. Harrington made a very complete linguistic study of the ethnobotany of the Chumash and excavated several rancheria sites which threw new light on the mode of life of these Indians. He also acted as assistant to Doctor Fewkes in the excavation of Elden Pueblo and in recording phonographically the songs of the Hopi Indians.

Mr. J. N. B. Hewitt completed early in the past year the manuscript "Iroquoian Cosmology, second part, with introduction and notes." He devoted considerable time to work upon the manuscript report on the Indian tribes of the upper Missouri River made by Edwin Thompson Denig to the Hon. Isaac Stevens, Governor of Washington Territory, and in recording lexical and grammatical material in the language of the Nez Percé Indians of the Shahaptian linguistic stock. Mr. Hewitt reports, as custodian of manuscripts, that the cataloguing of the manuscripts has been completed and the cataloguing of the phonographic records of Indian music begun. On May 8, 1927, Mr. Hewitt went to Brantford, Canada, where he resumed his researches, studying intensively the rituals, laws, customs, and chants characteristic of the League of the Iroquois. He recorded the text and music of several chants.

Dr. F. H. H. Roberts, jr., joined the staff of the bureau November 1, 1926. His winter months were devoted to a study of the ceramics of the San Juan area of the Southwest. In the spring Dr. Roberts left Washington for the West, making a study of ceramic forms in

the Museum of the University of Colorado at Boulder, Colo., and an investigation of certain caves near El Paso, Tex. On May 13, 1927, he left El Paso for Chaco Canyon, in northwestern New Mexico, where excavation was begun on some slab houses. Between May 17 and June 30, 12 houses, 20 storage cists, and 1 large kiva were excavated. All of the houses were of the semisubterranean, single-room type, rectangular or oval in shape, usually about 15 feet long and 10 feet wide.

Miss Frances Densmore conducted her researches on Indian music in a wider field than in any year preceding. She spent five weeks in Neah Bay, Wash., where more than 140 songs of the Makah Indians were recorded. From Neah Bay she went to Chilliwack, British Columbia, where Indians from a wide territory are annually employed as pickers in the hop fields. More than 125 songs were recorded. Seven manuscripts on the results of this field work were submitted to the bureau for publication.

Dr. Aleš Hrdlička, curator of physical anthropology in the National Museum, during the spring and summer of 1926 made a comprehensive anthropological and archeological survey in Alaska under the auspices of the bureau. In spite of many difficulties encountered, particularly in the matter of transportation, the trip was very successful. The scientific results of this important survey, bearing on the antiquity of man and the archeology of the Eskimos, are given briefly in the report of the bureau.

Dr. Walter Hough, head curator of the department of anthropology, United States National Museum, was detailed to examine recent excavations at Indian Mound, Tenn., reported by the Hon. Joseph W. Byrns. Excavations on the summit of the large burial mound which gives the town its name disclosed several slab-box burials, a number of skeletons, and a few artifacts. Dr. Hough also visited a number of village sites, burial mounds, and flint quarries in the vicinity and collected numerous specimens.

The bureau published during the year Bulletins 82 and 83 and a list of the publications of the bureau. There were distributed 10,711 copies of bureau publications.

INTERNATIONAL EXCHANGES

The total resources for carrying on the exchange service during the year were \$52,507, including the congressional appropriation of \$46,260. With this sum there were handled by the service a total of 590,879 packages of governmental, scientific, and literary publications, including those received from correspondents in this country for distribution abroad, and those received from foreign countries for distribution to addresses in the United States. This number represents an increase of 110,103 packages over last year's

total, the largest yearly increase in the history of the service. This increase was due largely to the receipt from the Department of Agriculture of hundreds of small parcels formerly sent abroad directly by mail. The total weight of all packages handled was 553,125 pounds.

In accordance with the Brussels convention of 1886, 103 sets of United States governmental documents are now sent through the exchange service to depositories abroad—60 full sets and 43 partial sets. Lithuania and the State of Minas Geraes, Brazil, were added during the year to receive partial sets. China and Egypt adhered during the year to the exchange conventions and full sets of governmental documents are now sent to those countries, the Chinese depository being the Metropolitan Library in Peking, and the Egyptian depository the Bureau of Publications of the Ministry of Finances.

The exchange service, in addition to the routine exchanges, makes every effort, upon request, to assemble special series of publications needed by its correspondents in this country and abroad. For example, among such requests received the past year was one from the botanical department of the Natural History Museum in Vienna for certain American botanical publications. Through the efforts of the service, a considerable part of the material wanted was received by the Vienna Museum, for which the director of the botanical department expressed great appreciation.

NATIONAL ZOOLOGICAL PARK

The year has been a notable one for the park. The largest assemblage of animals ever brought to the park at one time was collected in Africa and brought to Washington by the Smithsonian-Chrysler Expedition; the number of visitors for the year far exceeded that of any previous year; and work was started on a new bird house, which has been badly needed for many years.

The Smithsonian-Chrysler Expedition, financed by Walter P. Chrysler, succeeded in collecting during four months in Tanganyika Territory over 1,000 live animals, birds, and reptiles, which were safely transported to Washington and added to the park exhibits. Dr. W. M. Mann, director of the park, headed the expedition. Among the more striking animals brought back were two giraffes, white-bearded gnu, impalla, reed buck, long-eared fox, greater kudu, eland, wart hogs, leopards, hyenas, civet cats, blue monkeys, and purple-faced monkeys, in addition to many smaller mammals, quantities of birds, and numerous reptiles. Acknowledgments of valuable assistance received by the expedition are given by Doctor Mann in his report appended hereto.

Additions to the collections from all sources totaled 1,535 animals, including 104 born and hatched in the park. Among the mam-

mals born were fallow deer, Barasingha deer, European deer, sika deer, hog deer, American bison, tahr goat, Indian antelope, guanaco, agouti, paca, Rocky Mountain sheep, European brown bear, and rhesus monkey. Losses by death occurred chiefly among animals either very recently received or that had been in the collection for a long time. At the close of the year, the collection consisted of 2,401 animals, including 539 mammals, 1,545 birds, and 317 reptiles and batrachians. Five hundred and ninety-two different species were represented.

The number of visitors to the park for the year was 2,867,235, a record figure. These included 370 schools and classes, totalling 25,000 individuals.

Improvements during the year included a new flight cage, containing two pools, for gulls, terns, and other water birds; alterations in the lion house, bird house, and monkey house to accommodate the animals resulting from the Smithsonian-Chrysler Expedition; the installation of an electric pump with new and larger pipe connections for supplying warmed water to the hippo, tapir, and alligator pools; and a service road to the site of the new bird house.

Construction was begun on the new bird house in the late spring of 1927, and satisfactory progress was made in grading, laying foundations, and brickwork during the rest of the fiscal year. It is hoped that the bird collection may be installed in the new building early in the spring of 1928. This new bird house will form a notable improvement to the park, and the bird collection, shown under modern hygienic conditions, will become one of the most impressive exhibits in the park.

Although the bird house is a step in the right direction, the director calls attention to the fact that several other new exhibition buildings are urgently needed. The collection of animals is one of the finest in this country; the park itself provides probably the finest natural surroundings for a collection of animals of any zoo in the world; but the buildings are now entirely unsuitable and are continually unfavorably commented upon by visitors. The three buildings most needed are a reptile and batrachian house, a small mammal house, and a pachyderm house. The reptile house, in particular, is badly needed immediately; for although reptiles form the most popular and instructive exhibit at all zoos, there is no provision whatever at the National Zoo for their care and proper exhibition.

Attention is called by the director to the fact that nearly all zoological parks maintain restaurants and refreshment stands, profits from which are used to purchase new animals. A limited number of such concessions at the National Zoo would not only provide better service to the public but would make available funds for the purchase of new specimens for the exhibition collection:

ASTROPHYSICAL OBSERVATORY

Work at Washington included preparations for an attempt to improve on the results of 1923 in measuring the energy-spectra of certain stars. Work was also begun on a new type of pyrheliometer for the solar observations, designed to still further reduce errors.

The important work of revision of the solar radiation measurements was continued vigorously during the year. The records from the Montezuma station from 1923 to date were completely re-reduced, giving values which may now be considered definitive. The observations from the Table Mountain station are being similarly treated, and when completed will permit of the publication of definitive values from that station also.

The observing station at Table Mountain, Calif., which replaces that formerly occupied at Mount Harqua Hala, Ariz., has been in continuous operation throughout the year. Although the number of days on which solar observations may be made does not greatly exceed that at Harqua Hala, the quality of those days for observing, especially from June to September, is vastly superior. The daily results from the Montezuma, Chile, station have been published on the United States weather maps of the day following. They have also been transmitted daily by telegraph to the Argentine Government and to the publisher of a monthly meteorological bulletin containing them. The station on Mount Brukkaros, South West Africa, built and maintained for the Institution by the National Geographic Society, began daily observations under the direction of Mr. W. H. Hoover, director, in December, 1926. It is too soon to decide how favorable the atmospheric conditions at this new station will be. For a considerable part of the time they have been first class, and what unfavorable weather has been experienced, according to old residents of the region, has been unusual.

Correlations of the variation in solar radiation with other results have appeared during the year. Doctor Pettit's observations of ultra-violet solar radiation are closely in proportion with the changes found in total solar radiation by the Smithsonian observers. Doctor Austin has found a very high correlation between changes in the solar constant and long-range radio reception.

Doctor Abbot has found a remarkable regular periodicity of $25\frac{2}{3}$ months in the solar variation itself, which, with the sun-spot cycle, accounts for almost the whole change in monthly mean solar constant results from 1920 to 1927. If this periodicity continues to show in the coming years, it may be possible to forecast at least two years in advance the principal solar changes, and whatever may be found to depend thereon.

INTERNATIONAL CATALOGUE OF SCIENTIFIC
LITERATURE

The United States bureau has continued to collect data for an index to the scientific publications of this country. Although postwar conditions forced the catalogue to suspend publication in 1921, every effort has been made by the 33 countries cooperating in the enterprise to keep the organization alive so that publication may be resumed when financial support appears. The latest published list of the scientific journals of the cooperating nations showed a total of 5,496 titles, and this number has since been greatly increased. The United States bureau is at present engaged in revising the list for this country.

A moderate capital fund is all that is needed to enable this great international undertaking to function fully again. For many years this was the most comprehensive bibliography of science available to students and research workers, and nothing has appeared since to take its place.

NECROLOGY

CHARLES DOOLITTLE WALCOTT

Charles Doolittle Walcott, fourth secretary of the Smithsonian Institution, died in Washington February 9, 1927. He had served as secretary for 20 years, and his death is a heavy blow to the Institution at a critical time in its history, as well as a great personal loss to his friends and associates. A detailed biographical sketch of Doctor Walcott will be published in the general appendix to the Annual Report of the Board of Regents, so that here I shall only very briefly outline his career.

Doctor Walcott was born at New York Mills, N. Y., March 31, 1850, and received his early education in the public schools of Utica and the Utica Academy. He did not attend a university but received his training in science from his own field excursions and from books and association with geologists. His first geological work was done in the capacity of assistant to James Hall, famous paleontologist, by whom he was assigned to field researches in Indiana, New York, Ohio, and Canada successively. In 1879 Professor Hall recommended him to the Director of the Geological Survey, Clarence King, and as a result he was made an assistant geologist in the survey. His first work was the study of geological sections from southern Utah to the Grand Canyon in Arizona, and this was followed by successful researches in Nevada and New England. His announced life work, however, was in the Cambrian, and this he pursued in the intervals of special assignments, presenting a review of his Cambrian studies to the International Geological Congress in London in 1888. In this same year he was appointed paleontologist in charge of invertebrate

paleontology in the Geological Survey, and five years later geologist in charge of geology and paleontology. In 1894 he was made director of the survey, succeeding Maj. J. W. Powell. This position he held until 1907, when he came to the Smithsonian as its fourth secretary, succeeding Samuel Pierpont Langley.

During his directorship of the survey he was extremely active in public affairs. He was instrumental in the organization of the Forest Service, the Reclamation Service, and of the Carnegie Institution of Washington, the last of which he continued to serve actively until his death.

As secretary of the Smithsonian, Doctor Walcott furthered its varied activities vigorously and successfully. During his administration the new building for the United States National Museum was brought to completion and opened to the public, and its collections increased enormously; the Freer Gallery of Art was constructed and the great Freer collection installed; the National Gallery of Art was created a distinct administrative unit under the Institution, and plans were inaugurated to provide a suitable national gallery building; and shortly before his death, perhaps the most important step of his administration was taken—the launching of a definite attempt to increase the endowment funds of the Institution. It is greatly to be regretted that he did not live to see the successful outcome of this project, which is expected to develop in the near future, for Doctor Walcott had felt keenly for many years the inadequacy of the present endowment to meet the unequalled opportunities of to-day to promote the increase and spread of knowledge.

The strenuous duties of secretary of the Smithsonian did not prevent Doctor Walcott from continuing his world-renowned researches in Cambrian geology and paleontology, and during the 20 years of his incumbency he published five large volumes of papers on these subjects.

Doctor Walcott received nearly all of the honors which science has to bestow, both in this country and abroad, including many honorary degrees, fellowships in learned societies, and research medals.

As a man, Doctor Walcott earned the lasting friendship and admiration of all those with whom he was closely associated through his nobility of character, his genial, whole-hearted friendliness, and his unswerving devotion to the ideals and purposes of the institution which he headed. Doctor Walcott was in every sense a worthy successor to the three great secretaries who came before him—Henry, Baird, and Langley.

WILLIAM HEALEY DALL

William Healey Dall, honorary curator of mollusks in the National Museum since 1880, died on March 27, 1927. He was born in Boston, August 21, 1845, and became interested in the study of shells at a

very early age. This study he cultivated at every possible opportunity, with the result that after a long and active career he was known at the time of his death as America's leading conchologist. His researches were not confined to that subject, however, and he published noteworthy contributions to paleontology, zoology, meteorology, and nomenclature. He was, in fact, one of the last survivors of the old school of "all-around" naturalists, which has practically disappeared in this day of ultra-specialization.

In 1865 Doctor Dall was put in charge of the scientific work of the International Telegraph Expedition to Alaska, which resulted in his exhaustive volume on "Alaska and its Resources," which for many years was the standard work on Alaska. In 1871 he joined the United States Coast Survey and continued his studies in Alaska, publishing an account of the meteorology of the region and a work entitled "The Coast Pilot of Alaska." In 1884 he was appointed a paleontologist of the United States Geological Survey, which position he filled until his death, holding at the same time his honorary title in the National Museum. During this period he produced hundreds of monographs and smaller papers, chiefly dealing with his specialty, mollusks. Doctor Dall's work was recognized internationally by election to American and foreign learned societies and by many honorary degrees.

FRANK HALL KNOWLTON

Frank Hall Knowlton, custodian of Mesozoic plants in the National Museum, died at his home in Ballston, Va., November 22, 1926. Doctor Knowlton's first association with the Institution was just after his graduation from college, when he worked in the Smithsonian taxidermy shop. Later he was appointed aid, and then assistant curator, in botany, with charge of the herbarium, the modest beginnings of the present great National Herbarium. At this time he began his work on fossil plants, and in 1889 was appointed an assistant paleontologist in the United States Geological Survey. He remained with the survey until his death, at the same time retaining his honorary position with the National Museum.

The full list of Doctor Knowlton's writings in paleobotany contains over 125 titles, and in addition he published nearly 100 papers in botany and ornithology. His publications have been of the greatest value to geology and paleobotany—to the latter, especially his catalogues of the Mesozoic and Tertiary plants of North America, which are used by students of the later floras in all countries. Among zoologists, Doctor Knowlton's "Birds of the World" is considered his most important scientific contribution.

Respectfully submitted.

C. G. ABBOT, *Acting Secretary.*

APPENDIX 1

REPORT ON THE UNITED STATES NATIONAL MUSEUM

SIR: I have the honor to submit the following report on the condition and operations of the United States National Museum for the fiscal year ended June 30, 1927.

The total appropriations for the maintenance of the National Museum for this period amount to \$609,320, an increase of \$10,928 above the appropriations for the year 1926. The additional sums available include \$8,918 under the appropriation for preservation of collections to provide for the following: Two assistants in the library, and one in the office of the assistant secretary in charge of the National Museum; the purchase of additional needed supplies; additional freight charges on specimens forwarded to the Museum; and a small sum for the purchase of specimens. Under the appropriation for furniture and fixtures an increase of \$1,930 covered one minor promotion on the salary roll, and additional funds to provide housing for new specimens in the collections. Under the amount allotted for heating and lighting an increase of \$580 added to small sums gained by retrenchment in other expenses permitted employment of an assistant telephone operator.

The increases that have been indicated have assisted materially in the work of the Museum, but require considerable addition before our organization can operate on a proper basis. Existing appropriations are taken up so largely with the overhead of routine expenditures that there is little available for exploration and field work, an important section of our labors. Great additions to our collections are made annually by many interested friends of the Institution, but the Museum should have adequate funds to enable it to develop researches in the field along logical and continuing lines. There come to the Museum frequent reports of valuable specimens that may be had if some one competent can go to the spot to obtain them. Many of these finds are of such nature that they can not be successfully handled by inexperienced persons, as unless properly collected they may not be worth the cost of transportation; whereas when secured by experienced hands they are highly valuable. At the present time much material of this kind is lost, though with comparatively small expenditure it might be preserved. It may be emphasized that opportunities for acquiring the rare items essential to a national museum are annually decreasing due to the changes wrought by encroaching civilization on natural features everywhere on the earth's

surface, with consequent extermination of living things and destruction of deposits of all kinds. Opportunities now neglected may never offer again. The National Museum of the United States should be in proper situation to avail itself fully of all opportunities to acquire useful materials.

There is need further for definite addition to the Museum staff. At the present time a number of divisions in which there are excellent collections are without curators. Proper training of assistants to handle such collections is a matter that requires years. In a number of our offices younger men should be now at work that they may be fitted to carry on investigations for the care of the collections when those now in charge have gone. Attention may be called also to the urgent necessity for additional clerical assistance for routine work in various offices in the four departments under which our collections are distributed.

The matter of increased compensation for the entire staff, both scientific and custodial, has become one of first importance. The reclassification act of July 1, 1924, provided for increased pay at definite rates if efficiency in the performance of duty is attained. The annual surveys of efficiency required by law have indicated that except in a few instances members of the staff have shown such attention in the performance of assigned duties as to entitle them to increases. With no funds available, it has been impossible to make increases on this basis without additions to the appropriations.

To look ahead to a matter not properly included in the present report it may be stated that in the appropriation for the year 1928 the Congress allowed additional items for one rate increases for the majority of the personnel. This step has given a measure of relief and has had a most favorable reaction on the part of the employees. As a result of this readjustment of the salary roll, made July 1, 1927, the majority of the staff in the fiscal year 1928 are receiving one rate more than the entrance salary established by law for the respective grades. To continue the intent of the reclassification act, further funds for promotion should be provided until the salaries of the various groups attain the average established for each grade. It is earnestly urged that further additions to the appropriations be made until this object can be attained. To do this will provide only proper reward for the conscientious performance of duty, while a better salary status will inevitably react favorably to the interests of the Museum.

As a national organization the Museum has tremendous scope in its scientific activities, as it is expected and desired that it shall maintain collections and be in position to supply information not only in many branches concerned with natural science but also in the field of history and the manifold phases of industrial development.

In the United States to-day there is an increasing group that is definitely interested in science and scientific matters, as is shown in a demand for authentic scientific news on the part of the press, for photographs of interesting scientific objects for publication, and by the general attitude of the public. As our country grows the number of those financially independent who turn to research and investigation as an avocation or with serious desire to assist in human knowledge steadily increases. These persons find in scientific matters both relaxation and inspiration, recreation and serious endeavor. This group now assists tremendously in the furtherance of scientific development and will be a steadily increasing force in that direction in the future. From their financial situation these persons make large contributions toward Federal income in the form of taxes, so that it would seem logical to make a small part of the money obtained in this way available for support of the immediate interests of the contributors in the form of increased appropriations for the governmental bureaus under direction of the Smithsonian Institution.

COLLECTIONS

Additions to the collections this fiscal year have been the most extensive that have come to the Institution during a similar period, as the total number of specimens received has amounted to 402,531, the largest additions coming in the departments of biology and geology. Material sent for examination and report amounted to 1,371 lots including thousands of specimens. Gifts to schools and other educational institutions came to 3,717 specimens. As exchanges with other institutions, 31,747 specimens of duplicate materials were sent out for which much of value was received. Approximately 25,000 specimens were loaned for study to various specialists.

Following is a digest of the more important accessions for the year in the various departments and divisions in the Museum.

Anthropology.—A collection of specimens obtained by Mr. M. W. Stirling during a prolonged exploration in the interior of Dutch New Guinea has included series of cultural objects entirely new to the collections. There is contained much previously unknown to science, secured from various groups of Papuans and from the pygmies of the Nassau Range in the interior of New Guinea. The entire collection is a gift to the Institution.

Several valuable collections have come through work of the Bureau of American Ethnology in Alaska, among which may be mentioned examples of many ancient and modern artifacts secured by Dr. A. Hrdlička in the summer of 1926. Gen. Tasker H. Bliss has presented a collection of several hundred specimens of costumes, weapons, weavings, and other objects of value from the Philippines. A

noteworthy set of painted sketches, head dresses, and other articles came as a gift from C. H. Heyl, 2d. Mrs. Richard Wainwright presented a number of interesting baskets and pieces of pottery.

In the division of American archeology there was received a large collection of pottery and various artifacts as a gift from the National Geographic Society, representing the material collected by Mr. N. M. Judd during several seasons of field work at Pueblo Bonito, N. Mex. Accompanying this, the society forwarded also material from other sites in New Mexico. The collections of Dr. J. Walter Fewkes from Eldon Pueblo, near Flagstaff, Ariz., of Mr. H. W. Krieger from the upper Columbia River, and Mr. H. B. Collins, jr., from Louisiana and Mississippi, during work for the Bureau of American Ethnology, have resulted in highly valuable material. The most valuable addition to the exhibits of the division of Old World archeology is a collection of Jewish religious ceremonial objects, Maccabean coins, and a number of art works and antiquities received as a loan from E. Deinard.

In the division of physical anthropology there has come a set of casts of skeletal remains of early man from Krapina, a collection of Indian and Eskimo skeletons and skulls from Alaska, and skeletal material from the lower Mississippi Valley.

Biology.—The number of specimens received in this division during the fiscal year amounted to more than 197,000 individual specimens. Of especial importance has been an exceedingly valuable collection of Siamese mammals, birds, reptiles, amphibians, fishes, insects, mollusks, and marine invertebrates, secured through Dr. Hugh M. Smith, Director of Fisheries for the Siamese Government. The Smithsonian-Chrysler Expedition to Africa, under Dr. W. M. Mann, Director of the National Zoological Park, while planned to secure living animals, brought back also valuable series of skins of mammals and birds and other materials for the National Museum. A South American expedition by Dr. Waldo L. Schmitt, under the auspices of the Walter Rathbone Bacon Traveling Scholarship, has brought large collections of crustaceans as well as specimens in many other groups. Mr. John D. Sherman presented a collection of about 20,000 water beetles, a highly important addition to the insect collections. Another large donation was that of about 10,000 moths presented by Dr. William Schaus, honorary assistant curator of insects. Through the unsettled political situation in China, zoological work in that country has been somewhat hampered, but nevertheless certain collections have been received from Mr. A. de C. Sowerby, through the generosity of Col. R. S. Clark.

Mr. B. H. Swales, honorary assistant curator of birds, presented 176 specimens and 7 skeletons of birds, including 46 species and 4

genera new to the Museum. About 100 of these come from the States of Parahyba and Ceará, Brazil. Dr. Charles W. Richmond, associate curator of birds, presented collections that include nine genera and six species hitherto lacking in the collections.

The United States Bureau of Fisheries transferred 338 specimens from various localities, among them the types of seven newly described species. Dr. E. A. Chapin of the Bureau of Entomology, donated a valuable collection of ectoparasites, with other materials. Capt. R. A. Bartlett presented 776 specimens of marine invertebrates, collected off the northwest coast of Greenland during the summer of 1926.

Among the most important additions in the National Herbarium there may be noted 9,500 specimens of plants from Colombia, collected for the Museum by Mr. E. P. Killip and Mr. Albert C. Smith, and 11,000 Jamaican plants, chiefly ferns, secured for the Museum by Dr. W. R. Maxon in Jamaica. There may be mentioned also the receipt of 50,000 mounted plants constituting the remaining half of the John Donnell Smith herbarium, presented to the Smithsonian Institution in 1905, but until this year retained for study in the custody of Captain Smith in Baltimore. The value of these collections to students in American botany can hardly be overestimated.

Geology.—The year has been one of unprecedented prosperity in the department of geology; as, although the number of accessions has not been large, the total number of specimens is overwhelmingly greater than last year, 208 accessions with a total of 176,781 specimens being recorded.

Of primary importance are the Washington A. Roebling and Frederick A. Canfield mineral collections, with their accompanying endowments. The former, gift of Mr. John A. Roebling, comprises approximately 16,000 specimens, embracing almost the entire number of known mineral species, and contains much of interest and value for exhibition. An endowment of \$150,000 was provided by Mr. Roebling to make additions to this collection and to assist in research in mineralogy. The Frederick A. Canfield collection, bequeathed to the Institution, contains upward of 9,000 specimens, and is notable chiefly for its fine examples of Franklin Furnace minerals, although containing in addition much of rare beauty and value for exhibition and study. An endowment of nearly \$50,000 was provided for the upkeep of the collection.

Dr. W. F. Foshag's exploratory work in northern Mexico in cooperation with Harvard University yielded exceptionally fine examples of minerals and ores. The series of radium minerals was materially increased by the transfer of those purchased for exhibition at the Sesquicentennial Exposition.

The chief source of material added to the collections in systematic and applied geology was the United States Geological Survey, nine sets of specimens illustrative of published reports being among the transfers. Crystalline masses of white cerussite were donated by the West Toledo Mining Co., Alta, Utah, and large sphalerite and galena specimens by Mr. F. Sansom, of Joplin, Mo.

In the collection of meteorites 35 specimens have been added, an unusually large number, of which 9 are new to the collection. These have come mainly from the Roebling and Canfield collections.

A collection of approximately 100,000 specimens of Mesozoic and Cenozoic fossils from Europe, presented by Ferdinand Canu, of Versailles, France, constitutes the most important accession in the division of stratigraphic paleontology. This, supplemented by collections made by members of the staff, gifts of type, and other valuable material by scientific institutions, universities, and individual collectors, as well as important exchanges, has made accessions in this division unusually noteworthy.

Of fossil vertebrates, the material exhibited at the Sesquicentennial Exposition consisting of unusual fish, turtle, and reptilian skeletal remains from the Niobrara Chalk of western Kansas is of chief importance. A partial skeleton of a large mammoth, discovered and presented by the Venice Co., of Venice, Fla., is of especial interest.

Arts and industries.—The collections in this department were increased by 14,497 specimens during the year. In the section of mineral and mechanical technology an exhibit showing the method of manufacture of artificial abrasive wheels with various by-products is of great importance. There was obtained also the United States Navy seaplane *NC-4*, from the Navy Department, as an addition to the aircraft exhibits. Included with it are several types of airplane engines. Of the greatest importance in the collections have been the Patent Office models transferred from the Department of Commerce, which have added materially to the series illustrating the development of various inventions and the progress of modern industry. These have included patents for practically all divisions of the department.

The textile collections have had added groups of silks from H. R. Mallinson & Co. (Inc.), bearing modern designs based in part upon motifs suggestive of the sea, and including designs representing seaweeds, starfish, corals, dolphins, gulls, and so on. A set of official standards of the United States for American cotton linters, transferred from the Bureau of Agricultural Economics, Department of Agriculture, illustrates the use of fibers obtained during the conditioning of cottonseed for oil extraction by a process of second ginning. The exhibit illustrates use of this material for many purposes.

Over 200 specimens of hides, skins, and leather products received from the Tanners' Council of America forms a valuable collection, illustrating commercial use of leather products. A collection of 95 specimens of footwear, collected by the late Frank G. Carpenter during his extensive travels, has been presented by Mrs. William Chapin Huntington.

In the division of medicine an instructive exhibit relating to vision was received from the American Optometric Association, through Dr. Thomas H. Martin. A second exhibit, gift of the American Dental Association, deals with the subject of oral hygiene.

In the section of wood technology the most valuable accession has been a series of 801 wood samples received as an exchange from Yale University School of Forestry, through Prof. Samuel J. Record, coming mainly from various localities in tropical America. New exhibits in this section have included sets of wood products from the Mason Fiber Co., and of a new fireplace fuel made from compressed wood waste by the United Products Co.

To the division of graphic arts there has come a gift of more than 2,000 prints and etched copper plates from Jean Leon Gerome Ferris, including the work of many famous artists, as well as etchings by the donor and his father, Stephen J. Ferris. The gift is one of value and importance. Mr. William Edwin Rudge contributed many examples of prints and samples of aquatone from his printing establishment. In the section of photography Miss Lillian M. Fletcher presented a set of paper negatives made by her father, Abel Fletcher, about 1845, representing specimens of the earliest paper negatives made in the United States.

In the Loeb collection of chemical types 175 specimens of rare chemicals were received. Many new contacts with research workers in the chemical field promise much new material in coming months.

History.—The Maryland Historical Society presented three fragments belonging with the original Star-Spangled Banner, removed many years ago by the original owner of the flag. It will be recalled that this flag was flown over Fort McHenry on September 13 and 14, 1814, and was immortalized by Key in the "Star-Spangled Banner."

Mrs. Calvin Coolidge presented a white satin brocaded evening dress, worn by her in the White House, for the series of costumes of the wives of the Presidents.

Forty-three United States gold, silver, nickel, and bronze coins dating from 1920 to 1926, and 81 medieval and modern European coins were transferred from the Treasury Department. The philatelic collection was increased by more than 5,000 specimens, the majority of which came from the Post Office Department. In addition

there were received further contributions to the precancel postage-stamp collection, presented by the Precancel Stamp Society through its president.

EXPLORATIONS AND FIELD WORK

Many valuable specimens and much new information have come through explorations carried on under special funds available through friends of the Institution, through a variety of cooperative arrangements, or to some extent from funds available from the Museum appropriations.

In anthropology there may be mentioned the field work of Dr. Aleš Hrdlička, curator of physical anthropology, who made an extensive reconnaissance in Alaska as a basis for further archeological and anthropological investigations in a field that has for many years been fruitful of results under the leadership of men traveling in the interests of the Smithsonian Institution. In the spring of 1927 this work was continued through Mr. H. W. Krieger, curator in the division of anthropology, who visited certain areas along the Yukon, and through Mr. H. B. Collins, jr., assistant curator in the same division, and Mr. T. Dale Stewart, of the division of physical anthropology, who went north to Nunivak Island, and were engaged there in exploration of old village sites at the close of the fiscal year. The results of their work will of necessity be held over until the next report, since the close of June found these men out of close touch with Washington. Mr. N. M. Judd has continued work at Pueblo Bonito, N. Mex., as director of the National Geographic Society's Pueblo Bonito expedition, the present field season being planned primarily to permit preparation of a scientific report on the results of this work. Much valuable material has been presented to the National Museum by the National Geographic Society as the outcome of these investigations.

Among the most important expeditions in which the Institution has cooperated has been that to the interior of Dutch New Guinea, by Mr. Matthew W. Stirling, formerly assistant curator of ethnology on the Museum staff, and his associates. The work was carried on through private means supplied by Mr. Stirling and his companions, and was finally developed as a joint enterprise with the Dutch Colonial Government. The principal object was to make anthropological and ethnological studies of the pygmy tribes which it was expected to find on the higher slopes of the Nassau mountains, with supplemental work among the Papuans of the lake plain. After establishing a base camp near the mouth of the Mamberamo River in May, the party made reconnaissance by means of an airplane taken especially for that purpose, and then with definite knowledge of the courses

of the streams that traversed the unknown interior pushed ahead by means of boats up the Mamberamo to the Rouffaar and along that stream to a point where an overland journey was made into the country of the pygmies. Travel was hindered by heavy floods and was beset with many uncertainties through difficulties attendant upon contact with the Papuans, who were excitable and nervous, and fearful of the intention of the invaders. The pygmies of the mountain slopes proved friendly and of entirely different disposition, so that Mr. Stirling and his companions lived among them at ease without necessity for the constant guard required with the natives of the lake plain. The party completed its observations in December. Shipments of specimens to the Museum consisted of 14 large cases containing thousands of implements from peoples living to-day under cultural conditions similar to those of the Stone Age elsewhere. Thanks to the generosity of Mr. Stirling and his companions, the National Museum now possesses one of the finest collections of the kind from New Guinea in existence. The work of the party has been of the highest importance in extending knowledge of one of the few unknown areas remaining on the earth's surface. The courtesy of the Dutch Colonial Government in cooperating in the scientific work, in providing steamer transportation both for the party and for subsequent shipments of supplies, and in furnishing guards to safeguard travel was greatly appreciated, and was of importance to the success of the expedition.

Dr. Waldo L. Schmitt, curator of marine invertebrates during the second year of incumbency under the Walter Rathbone Bacon scholarship, continued field studies of the crustacean fauna of South America, principally on the west coast from Guayaquil, Ecuador, to Punta Arenas, Chile, including visits to the islands of Juan Fernandez and the Falkland Islands, returning by way of Argentina. The collections brought to the Museum are far in excess of those of last year, due in part to a longer period in the field, and include several genera and one family of crustacea found for the first time on the west coast of South America.

Dr. Hugh M. Smith, Director of Fisheries of Siam, an honorary curator of zoology in the Museum, continued field work in Siam. His explorations have resulted in splendid collections of mammals, birds, reptiles, amphibians, mollusks, crustaceans, and insects, which are now being studied with the keenest interest by specialists in the Museum. He himself will undertake the study of the fishes.

The Smithsonian-Chrysler African Expedition to Tanganyika and Kenya under Dr. W. M. Mann, Director of the National Zoological Park, although undertaken to secure living animals, has resulted in additions to the Museum, since collections of birds, mammals, and

miscellaneous invertebrates, secured at odd times when the naturalists of the expedition were not engaged with living animals, were prepared and have been presented to our collections. The collections of birds preserved for dissection is especially notable.

Dr. Alexander Wetmore, assistant secretary in charge of the National Museum, traveling under the Swales fund, sailed from New York on March 22, 1927, for Port au Prince, Haiti. Until the end of April he carried on field investigations in Haiti and then crossed to the Dominican Republic, finally sailing north from Puerto Plata on June 3. Through the interest of Dr. W. L. Abbott, the Museum is in possession of extensive collections of birds, mammals, reptiles, amphibians, plants, and other specimens from Hispaniola. Doctor Wetmore's work in the field was planned with a view to supplementing Doctor Abbott's material when necessary and to gather information on faunal areas and distribution that will be useful in the preparation of reports on the Abbott collections now under way. His work in Haiti included investigations in the vicinity of Port au Prince and the southern peninsula; exploration on the high La Selle, unknown zoologically until this visit; a trip to the interior plain at Hinche; a visit to the caves near St. Michel, famous for their bone deposits; and finally work at Caracol on the north coast. In the Dominican Republic he worked principally on Samaná Bay and in the high interior in the valley of Constanza. His collections have included many items of interest, as among forms already described are a new species of thrush and a new genus of lizards from La Selle.

Owing to disturbed conditions in China, the activities of Mr. A. de C. Sowerby, under the auspices of Col. R. S. Clark, have been greatly curtailed. In spite of this, however, he has succeeded in sending the Museum large and valuable collections, especially of reptiles and fishes which have added notably to our series.

Mr. Clarence R. Shoemaker, assistant curator of marine invertebrates, visited the marine biological laboratory, Dry Tortugas, Fla., during July and August, 1926, under the auspices of the Carnegie Institution of Washington, for the purpose chiefly of making carcinological studies. More than 3,300 specimens of marine invertebrates were collected for the Museum.

Dr. Paul Bartsch, curator of mollusks, in 1926 spent August 10 to 21 at the Tortugas, and August 21 to 24 along the Florida Keys, examining Cerion colonies in continuation of his experiments in heredity with these organisms.

Dr. J. M. Aldrich, associate curator of insects, before the close of the fiscal year departed on an expedition to the western part of the country for the purpose of making collections of insects, principally

Diptera, in regions from which few specimens have been received in the past. His itinerary was planned to extend to California, returning through Nevada, Yellowstone Park, and the Black Hills.

Capt. R. A. Bartlett, a valued volunteer collector for the Museum, as a result of explorations off the northwest coast of Greenland in the summer of 1925, sent in 776 specimens of marine invertebrates.

Dr. W. R. Maxon, associate curator of plants, left Washington in May, 1926, for Jamaica to collect plants, returning early in the following August. His explorations, which were made possible by a grant from the American Association for the Advancement of Science, and the cooperation of the New York Botanical Garden and the United Fruit Co., were conducted in the extreme eastern end of the Blue Mountain Range, and in new areas on some of the high peaks to the westward. The present collection, which is of large extent, with material gathered during several previous trips, comprises ample series of specimens to show local distribution, altitudinal range, and habital forms of most of the 500 species of ferns known to occur in the island. Mr. E. P. Killip, aid, and Mr. Albert C. Smith, collaborator, left Washington for Colombia in October, 1926, and returned in April, 1927, spending approximately six months in collecting plants in the interior regions of that country. The expedition was organized through the cooperation of the New York Botanical Garden, the Gray Herbarium, the Arnold Arboretum, and Mr. Oakes Ames, with the National Museum. The greater part of the work was done in the general vicinity of Bucaramanga, in the Department of Santander, and along the Colombian-Venezuelan border in the Department Norte de Santander. The present exploration is the second in which Mr. Killip has participated in preparation for a report upon the plants of Colombia.

Prof. H. H. Bartlett, honorary collaborator, left last autumn for a year's botanical collecting trip in the East Indies. A considerable collection has already been received from Formosa and at last reports excellent results were being obtained in Sumatra.

Dr. W. F. Foshag, assistant curator of mineralogy and petrology, was in the field from May 23 to late September, 1926, collecting minerals and ores and studying their occurrence at some of the chief mining centers in Mexico. The localities visited were Los Lamentos, Santa Eulalia, La Ceja, Placer de Guadalupe, Cuchilla Parada, and Naica in the State of Chihuahua; Sierra Mojada in the State of Coahuila; and Velardena and Durango in the State of Durango. This expedition, undertaken in collaboration with Harvard University, was highly successful, due largely to the hearty cooperation of the Mexican Government officials and American mining engineers in charge of the properties. Over 2 tons of material were collected, from which representative sets have been selected for both Harvard and the National Museum.

A field trip by Dr. R. S. Bassler, curator of stratigraphic paleontology, during August and September, through France and Germany, included two weeks spent in a study of the Paris Basin in company with Dr. Ferdinand Canu, of Versailles, France, an eminent student of microfossils. Doctor Canu, to commemorate his long association with the paleontological work of the National Museum, presented to it his entire collection of French Cenozoic and Mesozoic fossils, numbering more than 100,000 specimens. Doctor Bassler visited in succession the Rhine Valley, the Valley of the Main, the Early Tertiary areas around Munich, and the classic Mesozoic region north of the Hartz Mountains.

Dr. C. E. Resser spent August and September in field work in the Rocky Mountains in continuation of the studies of Cambrian stratigraphy by the late secretary, Doctor Walcott. He was assisted by Mr. Erwin R. Pohl, of the paleontological staff, whose special interest in the Devonian led him to secure good study collections from these strata whenever encountered.

Under an allotment from the National Academy of Sciences, Mr. Charles W. Gilmore was again enabled to visit the Grand Canyon of the Colorado. While the main object of this trip was to assist in the development of certain educational features of the canyon for the National Park Service, an opportunity was offered to make further collections of fossil footprints from the Supai and the Hermit formations. A noteworthy slab of large size from the latter has the clearly impressed trackways of no less than three different kinds of animals on its surface and will make an unusually interesting exhibit.

In the early autumn of 1926 the Venice Co., of Venice, Fla., reported the discovery of fossil remains of a mammoth and cordially invited the Smithsonian to send and recover the specimen. Dr. J. W. Gidley was detailed for this work, which occupied 10 days. Though the skeleton was by no means complete, the portions found were of sufficient value to amply repay the time and expense required to collect and preserve them. Later in the fiscal year Doctor Gidley was again detailed to visit Curtis, Okla., and Sarasota, Fla., to investigate reported finds of fossil remains. The visit to the first-mentioned locality yielded remains of various Pleistocene mammals. At Sarasota and Zolfo Springs, Fla., a good collection representing a considerable fauna from the west coast was obtained.

BUILDINGS AND EQUIPMENT

Various minor repairs have been necessary to keep the buildings of the Museum in good condition during the year. In the Natural History Building the exterior surfaces of the metal window sashes on the first and second floors have been repainted. Concrete floors

in corridors have also received a coat of paint, and minor repairs have been made to walls and ceilings in various offices. The range housing the study collection of birds was painted and at the same time all the cases were painted white, which has greatly improved the lighting in this room.

In the Arts and Industries Building worn-out downspouts have been replaced and parts of the tin roofs given a coat of metallic paint. New wire screens have been installed and new awnings placed over the skylight over the café. It was also necessary to re-paint portions of the walls in several exhibition halls.

In the Smithsonian Building a number of window sashes and doors have been repaired and painted, and the remodeling of the disbursing office, begun in 1926 as a greater measure of precaution during the handling of funds, was completed. Various minor repairs that need not be enumerated were necessary.

The roof and the exterior of two sides of the metal Aircraft Building were painted and the other two sides were touched up where necessary.

In the heating plant the consumption of coal amounted to 3,329 tons of bituminous coal, an amount slightly less than was used in 1926. All told, the heating plant has been in operation nearly 18 years, during which time a number of major repairs and changes have been necessary. It is now in excellent condition. The boilers were inspected by the Steamboat Inspection Service of the United States, and reported in good condition. The new feed-water connections requested by the inspector the preceding year were changed to meet his approval. The elevators have been regularly inspected by the District of Columbia inspector and are equipped with all necessary safeguards to protect passengers. The total electric current produced amounted to 586,041 kilowatt hours, manufactured at a cost of 1.97 cents per kilowatt hour, including interest on the plant, depreciation, labor, and material. The present production is near the maximum for the plant as at present constructed. The ice plant manufactured 368 tons of ice at a cost of \$2.49, about 50 per cent less than the contract price on the general supply schedule, the saving on this item for the year being approximately \$1,000.

Labor turnover in connection with the heating, lighting, and power plant has been greater than ever before, due to the present low scale of salaries for firemen and under employees, a factor that greatly handicaps the work.

During the year 13 exhibition cases and bases, 253 pieces of storage, laboratory and office furniture, and 1,572 drawers of various kinds were added. These were manufactured mainly in the shops.

MEETINGS AND RECEPTIONS

The lecture rooms and auditorium of the National Museum during the present year were used for 114 meetings that covered a wide range of activities. Governmental agencies that utilized these resources included the Federal Horticultural Board, the Forest Service, the Bureau of Plant Industry, the Biological Survey, and the Extension Service of the United States Department of Agriculture, for various hearings, meetings, and exhibitions of pictures. Members of the Forest Service held a series of meetings during the year dealing with various phases of their work.

The Smithsonian staff convened on December 16 for an illustrated lecture on anthropology by Prof. H. D. Skinner, of Otago University, New Zealand. Dr. Walter Hough addressed the art section of the Twentieth Century Club on January 10.

Scientific societies that met regularly in the building included the Entomological Society of Washington, the Society for Philosophical Inquiry, the Anthropological Society of Washington, and the American Horticultural Society. Meetings were held also by the Vivarium Society, the Wild Flower Preservation Society, the Audubon Society of the District of Columbia, the Aeronautical Society, the Botanical Society of Washington, the Washington Society of Engineers, and the Washington Philatelic Society. The National Association of the Deaf gave an exhibition of motion pictures of the World War and two reels in deaf and dumb language. A special class of Southwestern College of Winfield, Kans., was convened in these halls, and the Mississippi Society of Washington occupied the auditorium for addresses by the Hon. Dennis Murphy, lieutenant governor of Mississippi, and others, the exhibition of motion pictures and a concert.

M. le Prince Ginori Conti, president of the Italian Society of General and Applied Chemistry, Florence, Italy, spoke before the International Union of Pure and Applied Chemistry on the utilization of geothermal power in Tuscany. The American Institute of Electrical Engineers and the American Society of Mechanical Engineers held a joint meeting for an address delivered by W. C. L. Elgin, general manager of the Philadelphia Electrical Co., on the Conowingo hydroelectric development.

The Spanish-American War veterans on January 28 held a reception in honor of the Ambassador from Cuba, Señor Dr. Orestes Ferrara, and Senator R. W. Means, of Colorado, on the anniversary of the birth of the Cuban patriot, José Martí. There was a patriotic gathering of American War Mothers on February 10, with vocal and instrumental music and addresses.

The Masonic clubs of the District of Columbia met in celebration of Washington's birthday, when they were addressed by the Hon.

A. M. Free, Member of Congress of California, on the Life of George Washington and Masonry.

During the late winter and early spring, series of talks were given to students of Howard University on various matters of contact between biological and medical science.

The Fourth National Oratorical Contest and Second International Oratorical Contest were held in the auditorium on April 9, for orations by pupils of private and parochial schools in the Washington Star area. A further meeting held on May 4 was addressed by three competitors.

Federal Post, No. 824, Veterans of Foreign Wars, met on May 28 for an annual memorial service. The finals in the third annual national spelling bee, under the auspices of the Courier-Journal, Louisville, Ky., and 16 associated newspapers, were held on June 23, when the first prize was won by Dean Lucas, of West Salem, Ohio.

From April 19 to 21 the District of Columbia Dental Society occupied the auditorium, lecture rooms, and part of the lobby for an educational campaign dealing with the care of the teeth. The exhibits installed were prepared in cooperation with the United States Public Health Service, United States Army, United States Navy, Children's Bureau of the United States Department of Labor, the division of physical anthropology of the United States National Museum, the Baltimore College of Dental Surgery of the University of Maryland, the Public School Dental Clinic of the District of Columbia Health Department, District of Columbia Dental Hygienist Association, and the District of Columbia Dental Society.

The Daughters of the American Revolution, conservation and thrift committee, attended an illustrated lecture by Herbert N. Wheeler on "The Lure of the Forest."

SESQUICENTENNIAL EXPOSITION, PHILADELPHIA

As stated in the report for last year, the Smithsonian Institution installed an exhibit at the Sesquicentennial Exposition held in Philadelphia during the summer and fall of 1926. As the exposition buildings were delayed in completion, the Institution did not secure possession of the space assigned to it until late in June, so that, though part of our material was arranged by June 30, it was not possible to make complete installation until July. The section assigned to the Smithsonian was one of the first in the Transportation Building to be arranged and made ready for display. The exposition continued until November 30, during which period one or more members of the staff remained in attendance with the exhibit. The exhibits, which were described in some detail in the report for last year, attracted much attention and were favorably received by the public. The

material shown was returned to Washington in December, all in good condition.

SPECIAL EXHIBITION FOR THE SMITHSONIAN INSTITUTION

At the conference of the establishment and Board of Regents of the Smithsonian Institution on February 11, 1927, called to advise with prominent Americans with reference to the future policy and field of service of the Institution, there was arranged in the main hall of the Smithsonian building a special exhibit to demonstrate present activities and research. The National Museum, as one of the major organizations administered by the Smithsonian, was prominently represented through its departments.

For the occasion in question a series of temporary booths was arranged about the entire hall where tables and cases were utilized for the exhibition of specimens, and the walls were given over to charts, diagrams, and photographs. The entire installation was arranged not as a temporary transfer of cases and materials from the National Museum but as a demonstration of research activities on the part of the staff. Each object or each chart displayed, while shown for its interest, was designed to represent some particular phase of science, and the whole was planned to show a cross section of existing researches as developed in the Institution in general.

The department of anthropology was represented by materials to show recent studies in the anthropology and archeology of the Columbia River Valleys of Alaska, the lower Mississippi Valley, and the ancient Indian pueblos of the Southwest, supplemented by certain matters dealing with Old World archeology, with the evolution of man as a species in the animal kingdom, and with the development of the modern American since the invasion of the New World by the Caucasian race.

Projects illustrated in geology and paleontology included studies in elephants and dinosaurs as representative of ancient vertebrate life, and illustrations of investigations into the thousands of fossil species known among the invertebrates, of the highest importance as indicators of the age of ancient rock strata with their included oils and minerals. With these were examples of minerals taken from recent gifts and bequests in the Roebing and Canfield collections, together with materials to illustrate the formation of soil through the disintegration of granite and other rock.

The work comprised in the department of biology is so vast that attempt was made to cover only a few of its various branches. The section devoted to botany, important as the foundation of agriculture, was illustrated by the results of recent explorations on the plant life of tropical America, and by demonstrations of systematic

studies in various groups of plants. In zoology there were shown specimens of reptiles, paintings of fishes, insects, birds, mollusks, mammals, foraminifera, crinoids or sea lilies, and other animals arranged to demonstrate various researches, some of purely scientific interest, others of known economic application. With each section of the exhibits there were in attendance research workers of the scientific staff to explain them fully. The exhibits proved so popular that they were thrown open to the public for several days during the week that followed.

MISCELLANEOUS

The exhibition halls of the National Museum were open during the year on week days from 9 a. m. to 4.30 p. m., while in addition the natural history building and the arts and industries building were open Sunday afternoons from 1.30 to 4.30 p. m. The exhibition halls were closed only on Christmas Day and New Year's Day. Visitors during the year aggregated 1,153,212 persons, an increase of nearly 50,000 over the previous year. Attendance in the several buildings was recorded as follows: Smithsonian, 128,868; arts and industries, 380,430; natural history, 561,286; aircraft, 82,628. The average daily attendance for week days was 3,263 and for Sundays, with only two buildings open, 2,660.

During the year the Museum published 10 volumes and 63 separate papers, while its distribution of literature amounted to 110,580 copies of its various books and pamphlets.

Additions to the Museum library have included 2,492 volumes and 1,299 pamphlets obtained partly by exchange and partly by donation. A large part of the increase has come from the Library of Congress, which has generously presented from its duplicates volumes and parts of volumes needed to complete reference series in the Museum library. The library staff devoted much attention during the year to filling in gaps in sets of periodicals, many of them dating back to the time of the World War when communication with foreign countries was much interrupted and there was consequent loss of mail. These efforts have resulted in a highly gratifying condition in the filling out of many sets. There are at present 37 sectional libraries maintained as important working units of the main library.

Mr. A. Brazier Howell, corresponding secretary of the American Society of Mammalogists, well known for his systematic and anatomical studies on mammals, was appointed collaborator in the division of mammals on December 11, 1926. Miss Isobel H. Lenman, of Washington, D. C., who has long been a benefactor of the national collections, was made a collaborator in ethnology on March 30, 1927. The appointment of Dr. George Grant MacCurdy as collaborator in anthropology was extended for one year, and Mr. Albert C. Smith

was made collaborator in the division of plants for one year from October 1, 1926. Dr. Joseph A. Cushman, internationally known for his work on foraminifera, was appointed collaborator in the division of stratigraphic paleontology for the period of six months beginning May 10, 1927.

Mr. T. D. Stewart was permanently appointed as aid in the division of physical anthropology on March 1, 1927. Miss Doris M. Cochran was promoted from aid to assistant curator in the division of reptiles and batrachians on the same date. On July 1, 1926, Miss Margaret W. Moodey, in the division of geology, was advanced from recorder to aid. Dr. Paul Bartsch, curator of mollusks in the department of biology, was given added appointment on April 18, 1927, as curator of Cenozoic invertebrates in the department of geology.

Under the National Museum there were 97 separations from the service during the fiscal year in question, which amounts to an annual turnover of 27.3 per cent. Most of this has come among the guard and mechanical force. The resulting condition is serious, since it has made it difficult to keep the minor positions filled in a manner necessary for the proper performance of required duties. It is hoped that the slight advances given in salaries on July 1, 1927, may somewhat alleviate this condition, but further increases should be made possible to enable the Museum to maintain a permanent staff in the positions in question.

The Museum was deprived by death of several important members of its scientific staff, all of whom had long been associated with its work. First among these was Dr. Charles D. Walcott, secretary of the Smithsonian Institution and keeper ex officio of the National Museum, whose death came February 9, 1927. Dr. Frank H. Knowlton, of the Geological Survey, honorary custodian of Mesozoic plants since 1894, died on November 22, 1926. Dr. Paul Haupt, associate in historic archeology since 1905, died on February 17, 1926. Dr. William Healey Dall, honorary curator of the division of mollusks and of Cenozoic invertebrates, who was affiliated with the Smithsonian Institution and the National Museum for a period of 58 years, died on March 27, 1927. Another loss by death was that of Mr. Geo. C. McClain, for over 40 years a member of the mechanical force of the National Museum.

Respectfully submitted.

ALEXANDER WETMORE,
Assistant Secretary.

DR. CHARLES G. ABBOT,
Acting Secretary, Smithsonian Institution.

APPENDIX 2

REPORT ON THE NATIONAL GALLERY OF ART

SIR: I have the honor to submit the following report on the affairs of the National Gallery of Art for the year ending June 30, 1927.

Although the year has been marked by numerous features and events of interest, the two great lines of prospective development have remained practically dormant—these are the erection of a gallery building and the enhancement of the collections by gift and bequest. The meagerness of the offerings of art works is doubtless due in large measure to the well-known fact that exhibition space in the National Museum is entirely exhausted.

THE GALLERY COMMISSION

The sixth annual meeting of the National Gallery Commission was held in the regents' room of the Smithsonian Institution, December 7, 1926. The members present were Gari Melchers, chairman; Frank J. Mather, jr., vice chairman; W. H. Holmes, secretary; Herbert Adams, James E. Fraser, J. H. Gest, John E. Lodge, Charles Moore, James Parmelee, E. W. Redfield, and C. D. Walcott.

The minutes of the preceding meeting were read and approved and the secretary presented his report on the activities of the gallery for the calendar year. The report touched briefly on affairs of administration, the offerings of art works by gift and bequest, the purchase of paintings from the Henry Ward Ranger fund, the loans and loan exhibits, etc., for the year.

Discussion arose regarding the war portrait collection, and after the expression of various views, the following resolution was adopted:

Resolved, That the National Gallery Commission looks with favor upon the establishment of a national portrait gallery (of which the present collection of war portraits may be regarded as the nucleus) to constitute a separate unit of the collections of the National Gallery of Art.

Mr. Mather, chairman of the committee on Old World art, spoke informally upon the project initiated at the 1925 meeting of organizing an exhibit of old masters in the gallery, saying that he had examined most of those owned in Washington and found them in his opinion not sufficiently representative to make their assemblage as an exhibit advisable, though he favored such an exhibition of old masters of the highest quality such as might be assembled by enlarging the field to be drawn upon.

After discussion of numerous topics of interest, the annual elections were held as provided by the regents' "plan." The present officers of the commission were reelected, as were also the members of the executive committee. The three members of the commission whose terms expire with the close of the present year—Gari Melchers, Herbert Adams, and Charles Moore—were recommended to the Board of Regents for reelection for the ensuing term of four years.

The following resolution provides for filling the vacancy occurring in the membership of the commission, due to the declination of John Russell Pope:

Resolved, That the National Gallery Commission hereby recommends to the Board of Regents the election of Clarence C. Zantzing, architect, of Philadelphia, to fill the vacancy in the membership of the commission, caused by the declination of Mr. John Russell Pope.

Resolved further, That in the event of the declination of Mr. Zantzing, the vacancy be filled by the election of Mr. Charles Borie, architect, of Philadelphia.

At 12 o'clock the commission adjourned and proceeded to the gallery to consider, as the advisory committee of the gallery, the acceptance of the art works offered during the year. The result is as follows: Acceptance for the national portrait collection of the 21 World War portrait sketches by John C. Johansen, name of donor withheld; acceptance of the portrait of Rear Admiral Robley D. Evans, by August Franzen, N. A., for the same collection, offered by Horatio S. Rubens; acceptance of a marble bust of Proserpine by Hiram Powers, offered by Mrs. George Cabot Lodge; acceptance of 16 portraits in red chalk, by John Elliott, of members of the Lafayette Escadrille and a few others of the American men who fought in the World War, offered by Mrs. John Elliott as a memorial to her husband, and tentative acceptance for the gallery of the collection of 10 paintings offered, to be known as the "George Buchanan Coale Collection, Baltimore, Md., 1819-1887," the final assignment of these works for record (to the Institution or to the gallery) to be left to the discretion of the director of the gallery.

SPECIAL EXHIBITIONS HELD IN THE GALLERY

The Herbert Waldron Faulkner Exhibition.—A collection of oil paintings of Venice from Dawn to Dusk, 36 in number, with 18 panel sketches, by Herbert Waldron Faulkner, was installed on screens in the middle room of the gallery November 29 to December 12, 1926.

The John Ross Key Memorial Exhibition.—A collection of 49 oil paintings and 14 drawings in pen and pencil, by John Ross Key (1837-1920) was exhibited as a memorial to the artist by his widow, Ellenore Dutcher Key, in the central room of the gallery from

January 15 to May 10, 1927. The subjects were largely landscapes and gardens, among which were numerous effective portrayals of colonial mansions, located to-day or in the past in Washington and its vicinity.

The John Elliott Memorial Exhibition.—A memorial collection of 20 portrait drawings in red chalk of members of the Lafayette Escadrille, with a few others of the American men who fought in the World War, most of whom lost their lives in the defense of France before the United States entered the war, by John Elliott (1858-1925), was exhibited by his widow, Maud Howe Elliott, February 19 to March 13, 1927. Sixteen of these portraits have been presented to the Smithsonian Institution by Mrs. Elliott while the others, loans to the exhibition on Mrs. Elliott's request, were returned to their respective owners.

The Charles Mason Remy Exhibition.—An architectural model of an oriental temple, designed and executed by Charles Mason Remy, was exhibited at the north entrance to the gallery for a short period. A series of photographs illustrating the exterior of the model, with gardens, terraces, and fountains, were shown.

THE HENRY WARD RANGER FUND

Since the paintings purchased during the year by the council of the National Academy of Design from the fund provided by the Henry Ward Ranger bequest are, under certain conditions, prospective additions to the gallery collections, the list, including the names of the institutions to which they have been assigned, may be given in this place.

Title	Artist	Date of purchase	Assignment
60. Still Life.....	Frank W. Benson, N. A.	December, 1926...	California Palace of the Legion of Honor, San Francisco, Calif.
61. Woodland Nymph....	Douglas Volk, N. A.....	April, 1927.....	Atlanta Art Association, Atlanta, Ga.
62. Man in White.....	Cecilia Beaux, N. A.....	do.....	The Brooklyn Institute of Arts and Sciences, Brooklyn, N. Y.

ACTIVITIES OF THE AMERICAN FEDERATION OF ARTS, AND THE FEDERATION OF WOMEN'S CLUBS

The American Federation of Arts, and the Federation of Women's Clubs continued their work on behalf of the gallery, furthering its interests with propaganda, lectures with the use of lantern slides and photographic prints, and circulating exhibits of paintings.

ART WORKS ADDED DURING YEAR

Accessions of art works by the Smithsonian Institution, subject to transfer to the National Gallery on approval of the advisory committee of the gallery commission, are as follows:

Twenty-one original studies in oil by John C. Johansen, N. A., utilized by Mr. Johansen in the execution of his great work, "Signing the Peace Treaty, June 28, 1919," and in portraits of distinguished leaders of America and the allied nations in the World War, now installed in the National Portrait Gallery, received through Mrs. James C. Rogerson, the donor's name being for the present reserved, here listed as:

- Premier Vittorio Emanuele Orlando, Italy.
- Hon. Jules Jusserand, France.
- M. Louis-Lucien Klotz, Finance Minister, France.
- Hon. Henry White, United States of America.
- Premier Georges Clemenceau, France.
- General Tasker Bliss, United States of America.
- Premier Ignace Jan Paderewski, Poland.
- Hon. Frank Lyon Polk, Assistant Secretary of State, United States of America.
- Hon. Earl of Balfour, Great Britain.
- Marechal Joseph Joffre, France.
- M. Stephen Pichon, Foreign Minister, France.
- President Woodrow Wilson, United States of America.
- Hon. Earl of Balfour, Great Britain, at his home.
- Marechal Joseph Joffre, France, at army headquarters, Paris.
- Hon. Henry White, United States of America, in room occupied by the American Peace Conference, Paris.
- Field Marshal Earl Douglas Haig, England, at army headquarters, London.
- Hon. Bonar Law, Great Britain, at No. 10 Downing Street, London.
- Interior of the Salle de Glaces, Palais de Versailles, where the treaty was signed.
- Premier David Lloyd George, Great Britain.
- Premier Ignace Jan Paderewski, Poland, in conference.
- Preliminary study for composition of the painting, "Signing the Peace Treaty, June 28, 1919."

Bust of "Proserpine" (marble) by Hiram Powers (1805-1873), with marble pedestal; and three Japanese panels; presented by Mrs. George Cabot Lodge, Washington, D. C.

Three busts by Henry Kirke Brown (1814-1886), N. A. 1851, presented by Mr. H. K. Bush-Brown: Life-size bust in plaster of Gen. Winfield Scott, modeled from life in Washington about 1858, used as a study for the equestrian statue of General Scott in Scott Circle, Washington, D. C.; life-size bust in marble of William Cullen Bryant (about 1850, before the poet had a full beard); life-size bust of Greco-Roman head modeled in Rome about 1844 and cast in bronze in Mr. Brown's studio in Brooklyn, N. Y., about 1850. This

is one of the first castings made in this country and is of special interest on this account.

Sixteen portraits in red chalk by John Elliott (1858-1925) of the original members of the Lafayette Escadrille and a few others of the American men who fought in the World War. Gift of Mrs. Maud Howe Elliott, widow of the artist, as a memorial to her husband, for the national portrait collection.

Richard Norton.
Victor Emmanuel Chapman.
Norman Prince.
Hamilton Coolidge.
Quentin Roosevelt.
Paul Pavelka.
Bert Hall.
James R. McConnell.

Richard Stevens Conover, 2d.
Georges Thénault.
Gervais Raoul Lufbery.
Edmond Charles Clinton Genet.
Alan Seeger.
Elliot Christopher Cowden.
William Thaw.
Philip Rhinelander.

Mrs. Elliott has added to her gift photographic enlargements of four similar portraits belonging to the set of 20 shown in her memorial exhibit, the originals of which were loaned by their respective owners, as follows:

Raynal Cawthorne Bolling (from the United States Steel Corporation).
Richard McCall Elliot, jr. (from Mrs. Richard McCall Elliot, Bryn Mawr, Pa.).
William Halsall Cheney (from Mrs. William H. Schofield, Peterborough, N. H.).
Kiffin Yates Rockwell (from Mrs. Kiffin Rockwell, Asheville, N. C.).

Landscape in oil entitled "The Brook" (a sketch from nature of Bouquet River in the Adirondack Mountains) by Clinton Ogilvie (1836-1900), A. N. A. 1864; and a portrait bust in bronze, on marble plinth, of Clinton Ogilvie, by Paul Wayland Bartlett (1865-1925), N. A. 1917; presented by Mr. William Francklyn Paris, of New York City.

Seven water-color paintings by Henry Bacon (1839-1912), given in memory of the artist by his widow, Louisa Lee Bacon, as follows:

The Parthenon, east façade (the Piraeus and hills of Parnassus in the distance).
The Parthenon (west façade).
The Erechtheum.
General View of the Acropolis at Sunset.
Central Metope of the Frieze of Phidias, Parthenon.
Theater of Dionysus (the violet-crowned Hymettus in the distance).
Temple of Nike Apteros (the Piraeus and Phaleron in the distance).

Centenary medal (bronze) issued in commemoration of the one hundredth anniversary of the company, presented by the president and directors of the Baltimore & Ohio Railroad. Mr. Hans Schuler, director of the Maryland Institute in Baltimore, designed the medal, which was reproduced direct from his models by the Medallie Art Co., New York City.

A portrait bust in marble of Dr. Alexander Graham Bell, by Victor Salvatore; presented to the Institution by the American Telephone & Telegraph Co., through Walter S. Gifford, president of the company, upon the occasion of the fiftieth anniversary of the birth of the telephone.

INSTALLATION OF THE ALFRED DUANE PELL COLLECTION

The Smithsonian Institution was able to avail itself of the services of Dr. S. W. Woodhouse, jr., associate of the Pennsylvania Museum and School of Industrial Art, Philadelphia, to identify, classify, catalogue, and label the porcelain, glassware, silverware, and other art objects of the Alfred Duane Pell collection. A selection of typical examples of the various groups is displayed in the Pell alcove of the National Gallery. The remainder of the collection, comprising duplicates of the porcelains together with other interesting varieties of objects, is, due to lack of space in the gallery, installed on the gallery of the west hall in the arts and industries building of the National Museum.

The porcelains of this collection are mainly old English, Continental European, Russian, and Chinese, though there are a few individual pieces from elsewhere. Probably the most attractive group comprises 25 examples of *pate sur pate* by Solon from the Minton factory. The Worcester factory is represented by many pieces from the time of Doctor Wall, and his immediate successors including typical old patterns. From the Sevres factory are examples from almost the very beginning of the factory down to the latter part of the nineteenth century, including pieces from the services of Charles X, Louis XVIII, Louis Philippe, and Louis Napoleon, with biscuit busts of many French notables. There are many pieces from old Paris. The Meissen factory is represented by examples of the older wares as well as by more modern figures and animal pieces. Groups from Vienna and from the St. Petersburg Imperial Factory add interest to the collection. The products of the latter were made exclusively for the royal family. Mention should also be made of the large group of Chinese blue and white reticulate ware of the eighteenth century.

LOANS ACCEPTED BY THE GALLERY

Eleven family portraits of the Rosses of Balnagown, Scotland, by British masters, and three artistic family antiquities, loaned by the Bruce Corporation (Ltd.), of Kildary, Scotland, and Wilmington, Del., through Col. Sir Charles Ross, as follows:

Admiral Sir. John Lockhart Ross, by Sir. Joshua Reynolds (1723-1792).
The Hon. Grizel Ross, by William Hogarth (1697-1764).

- The late Sir Charles W. A. Ross, by Sir Henry Raeburn (1756-1823)
 Miss Grace Lockhart, by Sir Henry Raeburn (1756-1823):
 The Earl of Lauderdale, artist undetermined.
 Lady Mary Ross (wife of the late Sir Charles W. A. Ross), by Sir Thomas Lawrence (1769-1830).
 Gen. Sir Charles Ross, by George Romney (1734-1802).
 Sir William Wallace, artist undetermined.
 John Graham of Claverhouse ("Bonnie Dundee"), artist undetermined.
 Lucy Walters and the Duke of Monmouth, by Sir Peter Lely (1618-1680).
 "Lady Standing by Tombstone," by Thomas Gainsborough (?) (1727-1788).
 Large silver tray, "Presented by the two Assurance Companies and Merchants of London To John Lockhart, Esq., Captain of His Majesty's Ship *Tartar* For his Gallant Service in protecting the Trade of the Nation by taking many French Privateers, in the years 1756 and 1757."
 Gold cup with separate cover inscribed: "Presented by the Society of the Merchant Venturers of the City of Bristol to Captain John Lockhart, Commander of His Majesty's Ship *Tartar* for the Important Services He Rendered to the Trade of that City, by Ably Protecting Her Merchantmen and Distressing Numerous French Privateers, 1758."
 Chair which belonged to Sir William Wallace (between 1290 and 1310).

Classical bust in bronze, lent by Miss Helena Lodge, Washington, D. C.

Portrait of Thomas Amory, of Boston, by Gilbert Stuart, lent by Miss Helen Amory Ernst, Washington, D. C.

Sculptured figure of a howling coyote (plaster cast), by Edward Kemeys, lent by Mrs. Edward Kemeys, to be placed with her collection of similar objects in the temporary possession of the gallery.

Five paintings by French masters, lent by the Hon. and Mrs. Louis A. Frothingham, North Easton, Mass., as follows:

- The Lake (panel), by C. F. Daubigny.
- Twilight on the River Oise (panel), by C. F. Daubigny.
- The Little Marauders (panel), by Narcisse Diaz.
- Groups of dogs, fox hounds (panel), by Narcisse Diaz.
- The Setting Sun (canvas), by J. B. C. Corot.

Plaster death mask of Napoleon Bonaparte (signed by Anton Marchi), described as the original death mask of Napoleon, lent by Mrs. L. R. Hoover, Washington, D. C.

Portrait bust in plaster of President James Monroe, by Margaret French Cresson (Mrs. William Penn Cresson), lent by Mrs. Cresson, Washington, D. C.

Portrait of Theophilus Parsons, first chief justice of Massachusetts, by Gilbert Stuart, lent by Mr. Theophilus Parsons, his great-grandson, Washington, D. C.

LOANS BY THE GALLERY

The American Federation of Arts borrowed three paintings for a special exhibition given by the Carnegie Public Library, Fort

Worth, Tex.: "June," by John W. Alexander, which has since been returned to its place in the gallery; and "By the River," by Stephen Bosnay, and "Schloss Monrepos," by Hermann Göhler, which are still being shown on circuit in Texas.

DISTRIBUTIONS

Paintings lent to the gallery have been withdrawn by their owners during the year as follows:

Portrait of Alexander Hamilton, by John Trumbull; portrait of Fisher Ames, by Gilbert Stuart; and River Landscape with Cattle, by Constant Troyon; withdrawn by Mr. John E. Lodge.

Five paintings by Old World masters and four by American painters: Portrait of Admiral Vernon, by Thomas Gainsborough; The Ford, by J. B. C. Corot; Garden at Giverny, by Claude Monet; Saskia as "Minerva," by Rembrandt Van Rijn; Children on the Beach, by T. Sorolla; Sunset, by George Inness; Olive Trees at Corfu, by John Singer Sargent; portrait of Mrs. Samuel Miller, by John Wesley Jarvis; and portrait of Sarah Cresson, by Thomas Sully; withdrawn by Mrs. Breckinridge Long.

Sixteen examples of the works of old masters: Portrait of a boy, by Sir Henry Raeburn; portrait of an Irish gentleman, by John Hoppner; portrait of Viscountess Hatton, by Sir Peter Lely; portrait of a gentleman, by Sir Godfrey Kneller; portrait of Judith von Volbergen, by P. Moreelse; landscape, by Richard Wilson; landscape, by Gainsborough; small landscape, by Gainsborough; landscape, by Constable; The Doctor's Visit, by Jan Steen; Scene in Venice, by Guardi; portrait of Sir Wm. Boothby, by Sir Joshua Reynolds; portrait of Mrs. Price, by Sir Joshua Reynolds; portrait of woman, by Drost or Vermeer; Turkish scene, by Diaz; and Grand Canal, Venice, by Canaletto; withdrawn by Mrs. Marshall Langhorne.

The Annunciation, attributed to Lorenzo Sabbatini; withdrawn by the Misses McKey, of New York City.

Six paintings and a bas-relief: Madonna and Child, by Francesco Bissolo; portrait of Mrs. Richard Eaton, by Charles Willson Peale; Spanish interior, by Juan Galves, 1598; Holy Family, attributed to Francesco Francia; portrait, Man in a Red Coat, attributed to Thomas Hudson, master of Sir Joshua Reynolds; portrait, Man Holding a Lily, artist unknown; and portrait, Sarah Redwood Lee (bronze bas-relief), by Augustus Saint-Gaudens; withdrawn by Miss Sarah Redwood Lee.

Two portraits of the late President Warren Gamaliel Harding, by E. Hodgson Smart, lent by the artist, were sent to the United States Capitol, care Senator Simeon D. Fess, at the request of the artist.

Portrait group of Mrs. Wheeler and her sons, by Thomas Sully; withdrawn by Capt. William D. Wheeler, United States Air Corps.

LIBRARY

The gallery library, by gift, purchase, and subscription, has reached a total of upward of 1,500 volumes, pamphlets, and periodicals.

A portfolio of unframed water color sketches, by William H. Holmes, has been presented by the artist.

COPYING

Mr. Wilbur Dean Hamilton, of the department of fine arts of the Massachusetts Normal Art School, Boston, Mass., completed a copy of the Romney portrait of John Wesley, belonging to the John H. McFadden collection, which copy is to be placed in the Wesley room in Lincoln College, Oxford, England. The privilege of making the copy was granted by the trustees of the collection, which is a loan to the gallery.

PUBLICATIONS

Holmes, W. H. Report on the National Gallery of Art for the year ending June 30, 1926. Appendix 2, report of the secretary of the Smithsonian Institution for the year ending June 30, 1926, pp. 50-60.

——— Plea for a National Gallery of Art. *Art and Archaeology*, Vol. XXIII, No. 2, February, 1927, pp. 50-69. 21 illustrations.

Catalogue of an exhibition of oil paintings of Venice from Dawn to Dusk, by Herbert Waldron Faulkner, on view in the central room of the National Gallery, Natural History Building, United States National Museum, November 29 to December 12, 1926. Washington, 1926, pp. 1-2.

Catalogue of a collection of paintings and drawings by the late John Ross Key (1837-1920), on view in the central room of the National Gallery, Natural History Building, United States National Museum, January 15 to February 6, 1927. Washington, 1927, pp. 1-3.

Catalogue of a memorial collection of drawings in red chalk by John Elliott (1858-1925) of the original members of the Lafayette Escadrille and a few others of the American men who fought in the Great War, on view in the central room of the National Gallery, Natural History Building, United States National Museum, February 19 to March 13, 1927. Washington, 1927, pp. 1-11.

Respectfully submitted.

W. H. HOLMES, *Director.*

Dr. CHARLES G. ABBOT,

Acting Secretary, Smithsonian Institution.

APPENDIX 3

REPORT ON THE FREER GALLERY OF ART

SIR: I have the honor to submit the seventh annual report on the Freer Gallery of Art for the year ending June 30, 1927:

THE COLLECTIONS

Additions to the collections by purchase are as follows:

POTTERY

27. 1. Persian bowl, tenth–eleventh century. Sphinx and scroll design carved in the biscuit. Green and black glaze.
27. 2. Persian plate, tenth–eleventh century. Animal design carved in the biscuit. White, *aubergine*, yellow and green glaze.
27. 3. Persian bowl, twelfth–thirteenth century. Rhages. Decoration painted in colors and gold on a white glaze.
27. 4. Persian (or Mesopotamian) bowl, tenth–eleventh century. Sphinx and chequer design carved in the biscuit. Green and black glaze.

PAINTING

27. 5. Persian, late thirteenth century.
27. 6. Two leaves from a *Manafi al Hayaican*, with paintings in water color and gold set in the text.

SCULPTURE

27. 7. Indian, eleventh–twelfth century. Trivikrama, one of the 24 images of Viṣṇu. Black schist.

Work within the collection has been carried forward in the section of Japanese painting and is almost completed at the date of this report. This work includes the reclassification of paintings, the translation of the inscriptions and seals upon them, and the recording of critical opinion. The section of Chinese pottery has also undergone an intensive study and a certain amount of revision in order to keep pace with the knowledge that is slowly being accumulated in this field.

During the year 123 objects have been submitted for an expert opinion upon them or for translations of their inscriptions, and several other Chinese and Japanese texts as well.

Changes in exhibition during the year have involved 4 Japanese screens, 6 Japanese panels, 2 Whistler pastels, 1 American pottery vase, 23 Chinese panels and 1 scroll, and 8 Indian paintings.

The work of reconditioning the ceiling of the Peacock Room, which was mentioned in the last annual report, was successfully completed

during the fall and early winter. The cabinet work involved in it was done in our own shop, and the restoration of the painted surface under the direction of the restorer employed by the gallery. The latter also put into safer condition the leather panel with the peacock design at the south end of the room and one painting by D. W. Tryon. In the oriental section two Chinese panels and two Japanese screens have been remounted and restored.

Additions to the library by purchase and gift include 37 volumes, of which 2 are in Japanese; 28 periodicals, and 151 pamphlets. A list of these accompanies this report as Appendix A (not printed). Thirteen volumes have been rebound.

The demand for photographs is constant, and in meeting it the gallery is building up its store of negatives. There are now 1,158 fine-art subjects available for purchase, at cost price, in sizes 5 by 7, 8 by 10, 11 by 14 and 18 by 22; and 24 subjects in post-card form. In addition to these, the gallery possesses 829 negatives of the Biblical manuscripts, from which photographs can be obtained on order. One thousand two hundred and forty-six photographs, 34 lantern slides, and 1,569 post cards have been sold during the year, and one rubbing from a Chinese carved stone, which was made to order. Of the gallery publications, 332 gallery books, 583 descriptive pamphlets, 256 *Synopsis of History*, and 9 floor plans have been sold.

THE BUILDING

For several months the shop was occupied with the tedious and delicate repair work necessitated by the reconditioning of the ceiling of the Peacock Room. Other shop work includes the work on exhibition cases and pedestals, the making of various articles of equipment, and ordinary repair work.

The most marked change in the appearance of the building has been occasioned by the substitution of grass plots for the four corner sections of brick work in the court. It is thought that this change will not only yield a greater pleasure to the eye but that it will materially decrease the amount of radiated heat during the summer months. A detailed report made by the superintendent is submitted herewith as Appendix C (not printed).

ATTENDANCE

The gallery has been open every day with the exception of Mondays, Christmas Day, and New Year's Day from 9 until 4.30 o'clock, and until 12 o'clock on June 11, the day set aside to honor Colonel Lindbergh on his return from France. The total attendance for the year was 110,753. The aggregate Sunday attendance was 31,254, making an average of 601; the week-day attendance amounted to

79,499, with a daily average of 307. Of these visitors, 823 came to the main offices—367 to take advantage of the facilities for study in the library and storage rooms; 84 to see the facsimiles of the biblical manuscripts; 7 to make drawings and sketches; 53 to submit objects for examination, 142 for general information, and 197 to examine or purchase photographs. Forty-five persons interested in museum work made a study of the building and its equipment. Twenty-four groups of people, representing several schools and other organizations, were given docent service in the galleries.

FIELD WORK

The most important single undertaking of the past year in the field was the preliminary excavation of an interesting prehistoric site in Shansi Province, from which a large amount—76 cases in all—of valuable material was recovered. This piece of work was carried out last autumn under the immediate supervision of Dr. Chi Li, whose full report is now in course of preparation. A general account of the activities of the field staff is, however, contained in Appendix B, submitted herewith (not printed).

PERSONNEL

Mr. Herbert E. Thompson, Boston, with his assistants, C. E. Durham and Alfred Lowe, worked on the preservation of the Peacock Room and one oil painting.

Mr. Y. Kinoshita, of the Museum of Fine Arts, Boston, worked at the gallery during the winter months on the preservation of oriental paintings.

Mr. A. G. Wenley, field assistant, spent the winter in study at the Collège de France, Paris.

Mr. C. W. Bishop, associate curator, has been temporarily recalled to the gallery.

Respectfully submitted.

J. E. LODGE,

Curator, Freer Gallery of Art.

Dr. C. G. ABBOT,

Acting Secretary, Smithsonian Institution.

APPENDIX 4

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, 1927, conducted in accordance with the act of Congress approved April 22, 1926. The act referred to contains the following item:

American Ethnology: For continuing ethnological researches among the American Indians and the natives of Hawaii, the excavation and preservation of archæologic remains under the direction of the Smithsonian Institution, including necessary employees, the preparation of manuscripts, drawings, illustrations, the purchase of necessary books and periodicals, and traveling expenses, \$57,160, of which amount not to exceed \$46,000 may be expended for personal services in the District of Columbia.

The chief, as in former years, has endeavored to use this appropriation as economically as possible, being always conscious that the amount available is too small to cover the expense of very extensive field work. His major aim is to make the money go as far as possible in the advancement of our knowledge of the Indian, and the diffusion of the information acquired.

Popular interest in anthropology, especially archeology, has increased greatly during the last decade, and each year replies to queries occupy more of the time of our staff. In spite of the limited appropriation, the bureau has had more investigators in the field during the past year than in any similar period of the present régime.

The systematic researches of the chief at Elden Pueblo, begun in the last fiscal year and treated in the report for 1925-26, were continued through July and August. All of the exterior walls and most of the interior rooms were completely excavated, the rough stone walls of the building showing that it was rectangular in outline and included dwellings, storage rooms, and a single kiva. It extended over a space measuring 145 by 125 feet, oriented approximately north and south. The standing walls range from 2 to 7 feet in height. Elden Pueblo is the largest ruin yet excavated in the Flagstaff region, but there are many others of the same general character still hidden from the light and demanding attention. Although the masonry is crude, the pottery of Elden Pueblo is well made, well decorated, and often highly polished, in a few cases closely recalling glazed ware which was rarely manufactured in prehistoric Arizona. Both the masonry and the ceramics of Elden Pueblo are closely allied to those of the little-known cliff ruins,

Kietsiel and Betatakin, and the open-air pueblos situated near St. George, Utah. The pueblo shows affinities with a culture antecedent to that of Sikyatki and Homolobi, the former being late prehistoric and the latter post-Columbian.

In the midst of graves forming a cemetery on the east side of Elden Pueblo were found subterranean walled depressions, which remind one of those post-Basket Maker rooms or megalithic pit houses which form such a widespread architectural feature, of archaic age, in the Southwest.

Abundant human burials were discovered in cemeteries situated outside the eastern and northern sides. The skeletons were not flexed but lay at full length, their heads generally turned toward the east; those buried at the greatest depth were surrounded by burial offerings, in one instance covered with adobe or hardened clay. About 500 complete pottery vessels were brought back, half of which were unbroken. The collection also contains numerous sherds and other objects, the whole forming the largest collection of pre-Puebloan material of this epoch in the National Museum. In each burial was found an average of five to six ceramic objects such as bowls. This important collection is timely and, for the study of pueblo chronology, is much better than pottery fragments. The collection contains some of the oldest types of that southwestern pottery which was manufactured before the introduction of glazed ware. The specimens are also older than the yellow-red-brown type found at Sikyatki and Homolobi. It contains a large number of bright red bowls with burnished black interiors resembling the Pima and Papago ware of the Lower Gila and California.

In June, 1927, the chief undertook a short reconnaissance to Greenville, S. C., to test the desirability of undertaking field work in the Piedmont region, the archeology of which is little known. Though the trip was a short one, he was much gratified with the prospects for intensive work in the locality and hopes in the autumn to begin elaborate field investigations there. He examined several fine collections containing pottery, stone, and clay pipes, and other objects, none of which has ever been figured or described. He made a number of excursions into the surrounding country and visited several mounds in the Piedmont region, one of which was selected for subsequent explorations. Fragments of pottery picked up on the surface seem to indicate a Cherokee origin. A fine bowl found near the bank of the Savannah River was of Middle Mississippi type and resembled effigy vases from Arkansas. It would seem that the archeology of this region is complex and would well repay investigation, especially as so little attention has thus far been given to it.

The chief obtained many excellent photographs of archeological objects in the collection of Messrs. Thackston and Schwing, of Greenville, to whom, as well as to other citizens of the section, he wishes to express here his thanks for the many kindnesses which he received. The photographs, made by Dowling of Greenville, include several unique specimens.

Dr. John R. Swanton, ethnologist, was engaged during the past fiscal year in reading the proof of his papers on "Social Organization and Social Usages of the Indians of the Creek Confederacy"; "Aboriginal Culture of the Southeast"; and the proof of Mr. W. E. Myer's paper on "Trails of the Southeast." These papers are to appear in the forty-second annual report. Doctor Swanton prepared a paper of over 200 pages on the "Social and Religious Usages of the Chickasaw Indians," which has been accepted for publication. With the help of Miss Mae Tucker, he completed a card catalogue of the Timucua words contained in the printed works of Pareja and Movilla, which he is now engaged in studying and correcting. He also has in preparation a bulletin on the social and religious usages of the Choctaw Indians similar to that on the Chickasaw.

During the fiscal year Dr. Truman Michelson, ethnologist, continued his researches among the Algonquian tribes. In the early part of the year he began work among the Arapaho of Wyoming. Although many years ago he pointed out the divergent character of their language as compared with other Algonquian tongues, the past season's work brought this out even more clearly. It can not be denied that Algonquian elements occur in both the vocabulary and grammar of the language, even though the phonetic shifts are highly complex. But certain lexical elements, as well as certain morphological traits, must apparently be derived from other sources. From these preliminary studies it may be said that Arapaho might almost be called a stock in the making. These circumstances render an exhaustive study of the language highly desirable. In Washington Doctor Michelson prepared for publication by the bureau a manuscript entitled "Notes on the Buffalo Head Dance of the Thunder gens of the Fox Indians." He also corrected the proofs of Bulletin 85, "Contributions to Fox Ethnology."

He furthermore typed the Fox text and English translation of an account of the *wapanowiveni*, a text and translation of the same relating to the mythical origin of a major ceremony of the Thunder gens, and the Indian text of the Thunder dance of the Bear gens. All of these, combined with some additional material, will be presented for publication by the bureau. Doctor Michelson has prepared a brief paper on the St. Lawrence Island Eskimo crania in the United States National Museum, which is to be printed in the

American Journal of Physical Anthropology. This proves statistically that the crania are very uniform, and that, although the cranial index is higher than that of the eastern Eskimo, this could not be considered as showing admixture with a broad-headed type. He spent some time studying the alleged proof of the Australian and Melanesian affinities of certain American stocks, and found that it lacks a sound foundation. On his way west Doctor Michelson stopped in Chicago where he took the important measurements of all the Blackfoot (Siksika) crania in the Field Museum of Natural History. The average height of the male skulls is in round numbers 130 millimeters. These measurements, when combined with those of material in the United States National Museum, should be sufficient to settle a number of disputed points.

Mr. J. P. Harrington, ethnologist, during July and August, assisted the chief in the work at Elden Pueblo, described previously in this report. The rest of the year was devoted to the preparation for publication of field data obtained the previous year in the Chumash region of southern California. The Chumash are fast being acculturated to the languages and mode of life of the Mexican and American people with whom they are in daily contact and it is important that what information is still available be made a matter of record without further delay.

Through the cooperation of Mr. Earl V. Shannon, of the division of mineralogy of the National Museum, the paints used by the Indians were identified chemically, with interesting results, specimens purchased from living Indians and also those taken from graves being used for the purpose.

A very complete linguistic study of the ethnobotany of these Indians was carried out, with special attention to the ancient designations of the parts of the plants and their growth development. The designations of pollen, pistil, stamen, and petal vary widely as we pass from dialect to dialect, various words used for other conceptions being extended to cover them. This same irregularity has also been apparent in comparing the nomenclature of plant species.

Mr. Harrington also read proofs of his Kiowa and Picuris papers, which are now in press. The paper on the Kiowa is important for the classification of the Pueblo Indian languages. In connection with the Picuris paper, Miss H. H. Roberts prepared transcriptions and analyses of Picuris songs which will constitute the most complete study in existence of the music of this tribe.

Early in 1926, Mr. J. N. B. Hewitt, ethnologist, completed the manuscript "Iroquoian Cosmology, Second Part, with Introduction and Notes."

He has devoted considerable time to work upon the manuscript report on the Indian tribes of the Upper Missouri made by Edwin

Thompson Denig to the Hon. Isaac Stevens, Governor of Washington Territory, which has been under consideration for publication by the bureau for more than 10 years. This report has intrinsic merit, as it contains much ethnologic information which it is now impossible to obtain because of changed conditions in the life of the tribes mentioned in it.

Several evenings each week during the autumn and winter Mr. Hewitt devoted to the recording of lexical and grammatical material in the language of the Nez Percé Indians of the Shahaptian linguistic stock of the Powellian classification of Amerindian languages north of Mexico. In this work Mr. Hewitt was assisted by Mr. Mark Phinney, an intelligent and well-educated young man of that tribe, who is employed in the Office of Indian Affairs of the Interior Department.

This work was undertaken primarily to obtain ampler and more accurate linguistic material in this language further to elucidate and confirm certain fundamental conclusions reached by Mr. Hewitt in 1894 in regard to the genetic linguistic relationship of three contiguous northwestern linguistic stocks—namely, the Shahaptian, the Waiilatpuan, and the Lutuamian—of the Powellian classification of Amerindian languages north of Mexico. These fundamental conclusions were embodied in two formal reports to the director of the bureau, having been prepared for his especial use and at his behest as appears in the administrative report of the director for 1894. He approved the findings of both reports, although the last was not delivered until after the administrative report had been written; he had been verbally informed of what the conclusions would be. The first of these reports showed genetic linguistic relationship between the Shahaptian and the Waiilatpuan linguistic stocks of the Powellian classification of Amerindian tongues north of Mexico; and the second showed, likewise, genetic linguistic relationship between the Lutuamian stock of languages and the new group, Shahaptian-Waiilatpuan, established by the findings of the first report. Thus these two formal reports brought together into one linguistic stock the Shahaptian, the Waiilatpuan, and the Lutuamian linguistic stocks of the Powellian classification. To this new grouping of languages was tentatively assigned the name *Shapwailutan*, an artificial term made up of the initial syllables of the names of the three combined stocks. Mr. Hewitt has since then found no reason to change his conclusions in these two reports, and his work with Mr. Phinney has only strengthened his findings.

As custodian of manuscripts, Mr. Hewitt reports that, with the exception of a number of cross-references, the cataloguing of the manuscripts had been completed at the close of the fiscal year, and

that the cataloguing of the phonograph records of Indian music was the new work for the year.

On May 8, 1927, Mr. Hewitt went to Brantford, Canada, where he resumed his researches, studying intensively the rituals, laws, customs, and chants characteristic of the League of the Iroquois.

In 1896 Chief Seth Newhouse, a Mohawk, showed Mr. Hewitt a document upon which he had been working for more than 15 years. It purported to be the constitution and by-laws of the League of the Iroquois, in the compilation of which Mr. Newhouse had visited all the Iroquois reservations known to him in both Canada and the United States. Mr. Newhouse was an exceptionally fluent speaker in Mohawk, but instead of recording the material in the Mohawk tongue he painfully recorded it in picturesque broken English. Mr. Hewitt realized that the significance of the materials contained in this document had been lost in the attempted translation and finally convinced Mr. Newhouse that it was his duty to render the ideas underlying the English of the document into Mohawk. This he did in 1898, and the study of this material is one of Mr. Hewitt's present occupations.

Mr. Hewitt also recorded a Cayuga version of the Chant Along the Trails or The Chant of the Roll of the Founders of the Lodge; a Cayuga version of the chant, Over the Great Forest; the music scores of the several chants of the condoling and installation rituals of the league; and an "Introduction" in Cayuga and Onondaga to the second part of the requickening address which is uttered in the principal place of assembly.

Dr. F. H. H. Roberts, jr., archeologist, joined the staff of the Bureau of American Ethnology on November 1, 1926. His winter months were devoted to a study of the ceramics of the San Juan area of the Southwest. Doctor Roberts left Washington April 27 for Boulder, Colo., where a study of early ceramic forms was made in the museum of the University of Colorado.

On May 6 he visited El Paso, Tex., for the purpose of investigating certain caves in a small range of mountains which lie 25 miles northeast of the city, between El Paso and the far-famed Hueco Tanks. There are 28 of these natural recesses in the faces of the cliffs, in most cases just above the tops of the talus slopes. In general they open to the west or northwest. Most of them bear traces of Indian visitors. In the majority of the caves these traces are largely in the form of pictographs painted on the walls with red pigment. The pictures are in great part highly conventionalized and geometric in form. In two instances they were decidedly suggestive of the decorations on pottery from Casas Grandes in northern Mexico.

Three of the caves showed evidences of an occupation extending over a considerable period, judging from the amount of débris and ash on the floors. In the course of two hours' digging, 12 sandals, a number of spear shafts, a fragment of netting, several pieces of cord, portions of rabbit sticks, a few beads, and two potsherds were found.

The sandals are of a rare and interesting form which is not common in the better-known portions of the Southwest. A loop of yucca was twisted to form the edges of the sole and yucca leaves woven back and forth across this framework. Similar specimens have been found in caves in portions of west Texas, east of the present site, and at one or two places in the Mimbres Valley. Two strands of twisted yucca leaves were fastened together at the toe, running back about halfway on either side. The sandal was presumably held in place by passing the toe portion of the "tie" between two toes. The spear shafts were rather elaborately decorated with streamers of yucca fiber. In some instances a small stone point was used; in others a hardened wood point.

On May 13 Doctor Roberts left El Paso for the Chaco Canyon in northwestern New Mexico, where excavation was begun on some slab houses on the top of the south rim of the canyon 9 miles east of Pueblo Bonito and Chetro Kettle. Between May 17 and June 30, 12 houses, 20 storage cists, and 1 large kiva were excavated.

All of the houses proved to be of the semisubterranean single-room variety, rectangular or slightly oval in shape, averaging about 15 feet in length by about 10 feet in width. They were excavated 2½ to 3 feet deep and found to be lined with large slabs of stone, the whole covered with a pole, brush, and plaster superstructure supported on four poles in the interior of the house. In practically all cases there was a small opening to the south, possibly a door. Many of the features of these houses are similar to those which are found in, and considered characteristic of, the highly developed kivas or ceremonial rooms of the communal dwellings of later periods. The storage cists were small oval or circular pits about 2½ feet deep, lined with stone slabs. Houses and storage cists were grouped about the kiva, which is the first of its type to be excavated in the Southwest. The front of the banquette and the wall of the kiva were made of large slabs of stone; the latter were covered with a thick coating of adobe plaster.

Potsherds and other objects of the material culture of the builders of this slab-house village are scarce. The fragments of pottery found, however, are of the type which in southwestern archeology has been given the term "post-Basket Maker." Doctor Roberts be-

lieves them to be from a late phase of the post-Basket Maker culture, probably the end of the period and just prior to the beginning of the pre-Puebloan stage.

Fourteen burials were found and only three had accompanying mortuary offerings. The latter was, in each case, a bowl. Unfortunately the skeletons were in such a poor state of preservation that in all but three instances their removal was out of the question. None of the skulls was deformed, a typical Pueblo trait, and all were dolichocephals or "longheads." A detailed map was made.

SPECIAL RESEARCHES

The research in Indian music was conducted in a wider field during the past year than in any year preceding. In July, 1926, Miss Frances Densmore, collaborator in Indian music, returned to Neah Bay, Wash., to continue her study of the music of the Makah and of Indians from Vancouver Island who have married members of the Makah Tribe. More than 140 songs were recorded, including a group of old songs obtained from a woman of the Quileute Tribe, a particularly isolated tribe living south of Makah.

An exceptional opportunity for the study of Indian music was afforded by the celebration of "Makah Day" on August 26 and by the rehearsals preceding this annual festivity. The program depicted the arrival of a visiting tribe and the entertainment which in the old days would have taken place on such an occasion. The Indians who took the part of visitors arrived in a gaily decorated boat and were formally welcomed and escorted to the place of entertainment, where dances were given by expert Makah dancers. Several of these dances were dramatic presentations of tribal traditions. For example, it was the old belief of the Makah that many sorts of animals, birds, trees, and rocks were once human beings, and one of the most important dances was an impersonation of human beings who were the ancestors of the elk.

The songs recorded at Neah Bay included the songs of the Makah Day dances, rendered by the leading singers, and songs of the "impersonation dances" that formed part of the Klokali ceremony. In these dances they formerly impersonated the wolf, deer, and wild white geese. An interesting group of Clayoquot songs was addressed to the sea when the breakers were high and it was said "the sea always seemed to become calm soon after these songs were sung." A phase of music hitherto unstudied in detail was the old composed song, distinct from the song received in a dream. It appears from data collected in two localities that physical motion was considered an aid to musical composition, some musicians composing while

sitting in a swing, others while walking, and others (on the coast of British Columbia) while riding in a motor boat.

After five weeks at Neah Bay Miss Densmore went to Chilliwack, British Columbia, where Indians from a wide territory are annually employed as pickers in the hop fields. An effort was made to obtain songs of all important classes, from Indians as widely separated as possible. More than 125 songs were recorded, among the localities represented being the Nass, Skeena, Thompson, and Fraser Rivers, Port Simpson, the west coast of British Columbia and the southwest coast of Vancouver Island. The singers came from a region extending about 400 miles north and south and about 150 miles east and west. Two aged medicine men recorded songs which they use at the present time in treating the sick, and numerous healing songs were recorded by other Indians. One was for the cure of smallpox; in another the doctor addressed the seal, grizzly bear, and deer, asking their help, while the next song contained their favorable response. The medicine men appreciated the value of the work and recorded their songs without reluctance.

Mention should be made of the *slahal* game played often at the hop camp by a large number of Indians, with crowds of Indian spectators. The songs and method of playing the game were recorded, the players were photographed during a game, and the bone game implements were loaned for photographic purposes.

Seven manuscripts on the foregoing field work were submitted to the Bureau of American Ethnology with the following titles: "Songs of the Quileute Indians"; "Makah and Clayoquot songs for treating the sick and Makah songs in honor of the dead"; "Klokali songs of the Makah Indians"; "Songs of Indians living on the Sliamey and Homaco Reserves in British Columbia"; "Songs of Indians living at Port Simpson and on the Skeena and Nass Rivers in British Columbia"; "Makah and Clayoquot songs"; and "Songs and dances presented on Makah Day, 1926, at Neah Bay, Wash." A paper was also submitted entitled "A comparison between Pawnee songs and those previously analyzed," with 18 tables of analysis. The number of manuscript pages was 178 and the number of transcribed songs 124.

In British Columbia, as in the United States, opportunities for the study of genuine Indian music are rapidly passing, though there still remain old people who can sing the ancient songs.

Dr. Aleš Hrdlička, curator of physical anthropology, United States National Museum, made during the spring and summer of 1926 a comprehensive anthropological and archeological survey in Alaska.

Upon reaching the Seward Peninsula he found himself confronted with unsurmountable difficulties in the matter of transportation. The arrival of the Revenue Cutter *Bear* was a fortunate circumstance, for he secured both accommodation and promise of assistance in his work. Doctor Hrdlička left on the *Bear* July 22 with the intention of landing where indications might demand; but notwithstanding certain disadvantages, until the end of the *Bear's* journey he did not feel justified in leaving the ship.

The trip, barring the storms, ice, etc., was propitious. The ship stopped at every place of importance along the whole coast up to Point Barrow. He was given facilities and help to make at least the most necessary observations and collections.

Scientific results.—The whole trip was very useful, and threw a definite light on a number of important problems in the regions covered. It suggested definite notions as to what is to be done in the future, among which are the following:

Antiquity of man.—Much that was seen strengthens the probabilities, as well as showing the facilities of Asiatic migrations over and along the Seward Peninsula, across Bering Sea, and also by way of the Aleutian Islands. But material evidence of these comings was not found, and must be very limited, if not completely wanting, for the following reasons: The comings could have been only by small numbers of people, and these contingents would effect but small and temporary settlements along the coasts and perhaps the banks of a few streams. The reasons were a relative scarcity of the population in the northeastern parts of Asia, on account of the limited resources of that region; the more or less nomadic habits of the people, due to seasonal conditions and the shifting food supply; their dependence on the sea and rivers for both food and movement, the hinterland being poor in resources and not favorable for migrations toward more desirable regions.

Old Eskimo sites.—Older abandoned sites of the Eskimo, from those of small camps with perhaps only two or three "igloos" to good-sized dead villages, are quite common. They occur as a rule on, or just above, the low "spits" and beaches of the sea and on the banks of the rivers or lakes.

The Teller battle field.—This consists merely of a tundra plain, dotted with small lagoons. In its vicinity are at least two, and probably more, small old sites, with their graves for the most part already assimilated by the tundra. The plain itself shows, as far as seen, nothing but moss and other similar vegetation.

The archeological objects that it was possible to secure show: (1) Contact with Asia; (2) two varieties of decoration, rectilinear and curvilinear, the latter much superior to the former; (3) exten-

sive trading ("jade," slate, obsidian); (4) a great differentiation and variety in places, indicating a rather high culture.

This survey of conditions in the northwestern part of Alaska indicates the need of prompt work of archeological and anthropological nature in several directions.

Dr. Walter Hough, head curator of anthropology, United States National Museum, was detailed to examine recent excavations at Indian Mound, Tenn., reported by the Hon. Joseph W. Byrns. In the town of Indian Mound is a large burial mound from which the place derives its name. The mound is much lowered by cultivation, some of the older settlers affirming that it was several feet higher than at present.

Through the enterprise of Mr. T. W. Seay, jr., excavations in the summit of the mound brought to light several slab-box burials, a number of skeletons, and a few artifacts. From the surface of the mound and adjoining lots, showing rich, black soil containing artifacts, many specimens of stone implements have been picked up. Through the kindness of Mr. Seay, Doctor Hough visited a number of village sites, burial mounds, and flint quarries in the neighborhood of Indian Mound and Dover, collecting numerous specimens.

EDITORIAL WORK AND PUBLICATIONS

The editing of the publications of the bureau was continued through the year by Mr. Stanley Searles, editor, assisted by Mrs. Frances S. Nichols, editorial assistant. The status of the publications is presented in the following summary:

PUBLICATIONS ISSUED

- Bulletin 82. Archeological Observations North of the Rio Colorado, by Neil M. Judd. 171 pp., 61 pls., 46 figs.
 Bulletin 83. Burials of the Algonquian, Siouan, and Caddoan Tribes West of the Mississippi, by David I. Bushnell, jr. 103 pp., 37 pls., 3 figs.
 List of Publications of the Bureau of American Ethnology, 46 pp.

PUBLICATIONS IN PRESS OR IN PREPARATION

- Forty-first Annual Report. Accompanying papers: Coiled Basketry in British Columbia and Surrounding Region (Boas, assisted by Haeberlin, Roberts, and Teit); Two Prehistoric Villages in Middle Tennessee (Myer).
 Forty-second Annual Report. Accompanying papers: Social Organization and Social Usages of the Indians of the Creek Confederacy; Religious Beliefs and Medical Practices of the Creek Indians; Aboriginal Culture of the Southeast (Swanton); Indian Trails of the Southeast (Myer).
 Forty-third Annual Report. Accompanying papers: The Osage Tribe; Two Versions of the Child-naming Rite (La Flesche); Wawenock Myth Texts from Maine (Speck); Native Tribes and Dialects of Connecticut (Speck); Picuris Children's Stories, with Texts and Songs (Harrington); Iroquoian Cosmology—Part II (Hewitt).

- Forty-fourth Annual Report. Accompanying papers: Excavation of the Burton Mound at Santa Barbara, Calif. (Harrington); Social and Religious Usages of the Chickasaw Indians (Swanton); Uses of Plants by the Chippewa Indians (Densmore); Archeological Investigations—II (Fowke).
 Bulletin 84. A Vocabulary of the Kiowa Language (Harrington).
 Bulletin 85. Contributions to Fox Ethnology (Michelson).
 Bulletin 86. Chippewa Customs (Densmore).

DISTRIBUTION OF PUBLICATIONS

The distribution of the publications of the bureau has been continued under the immediate charge of Miss Helen Munroe, assisted by Miss Emma B. Powers. Publications were distributed as follows:

Report volumes and separates.....	1,474
Bulletins and separates.....	7,289
Contributions to North American Ethnology.....	34
Miscellaneous publications.....	1,914

As compared with the fiscal year ending June 30, 1926, there was a decrease of 3,079 publications distributed. This was partly due to the fact that one less publication was distributed to the mailing list than in the previous year.

Six addresses were added to the mailing list during the year and 31 taken from the list, making a net decrease of 25. The list now stands at 1,713.

ILLUSTRATIONS

Following is a summary of work accomplished in the illustration branch of the bureau under the supervision of Mr. DeLancey Gill, illustrator:

Illustrations: Photographs retouched and lettered, drawings, etc., prepared and made ready for engraving.....	647
Drawings made, maps, diagrams, etc.....	44
Illustrations, engraver's proof criticized.....	516
Colored illustration proofs examined at Government Printing Office....	10,500
Photographic prints of archeologic and ethnologic subjects.....	603
Negatives made.....	72
Lantern slides.....	16
Photographic enlargements.....	6
Film rolls developed from field exposures.....	24

About 70 per cent of the photographic laboratory work for the bureau was done by Dr. A. J. Olmsted, of the United States National Museum; and 50 per cent of the illustration work by Mr. Gill was for the publications of the various bureaus of the Smithsonian in cooperation. This arrangement has proved eminently satisfactory in the past year, with a substantial saving of more than 80 per cent of the former cost.

LIBRARY

The reference library has continued under the immediate care of Miss Ella Leary, librarian, assisted by Mr. Thomas Blackwell. The library consists of 27,141 volumes, about 15,937 pamphlets, and several thousand unbound periodicals. During the year 480 books were accessioned, of which 83 were acquired by purchase and 397 by gift and exchange; also 3,950 serials, chiefly the publications of learned societies, were received and recorded, of which only 102 were obtained by purchase, the remainder being received through exchange. Of pamphlets, 225 were obtained. During the year 288 volumes were sent to the bindery. The catalogue was increased by the addition of 1,980 cards. A considerable amount of time was given to preparing bibliographic lists for correspondents. The endeavor to supply deficiencies in the sets of publications of institutions of learning was continued without remission. Requisition was made on the Library of Congress during the year for an aggregate of 300 volumes for official use. The Bureau library was frequently consulted by officers of other Government establishments.

COLLECTIONS

92528. Collection of archeological and skeletal material (740 specimens) secured along the Upper Columbia River, Washington, during the spring of 1926 by Herbert W. Krieger.
92528. Skeleton of a shaman (less the skull), 2 femora of another shaman, and 2 bleached bones from the skeleton of a chief, all Tlinkit, of Alaska, collected by Dr. A. Hrdlička.
94202. Small collection of shell beads and bracelets, and stone implements, obtained from the ruin of Las Trincheras in the Altar districts of Sonora by S. A. Williams.
94776. Archeological specimens from Arkansas, Colorado, Florida, Kentucky, and Tennessee, secured by various collectors for the bureau. (25 specimens.)
93522. Anthropological, geological, and biological material collected by Dr. Aleš Hrdlička in Alaska during the summer of 1926. (1,374 specimens.)
93607. Material collected during the summer of 1926 in Louisiana and Mississippi by Henry B. Collins, jr. (236 specimens.)
95011. Ten master records of Hopi Indian songs recorded during the summer of 1926 at the Grand Canyon by Dr. J. Walter Fewkes and two master records of a speech by William Jennings Bryan.
95372. One carved and painted wooden figure representing a Hopi snake priest.
96091. Four Indian crania from Elden Pueblo, Ariz., and 2 from Montezuma Canyon, Colo.
96920. Collection of archeological objects gathered for the bureau at Indian Mound, Tenn., by Dr. Walter Hough.
96921. Archeological material collected for the bureau at Elden Pueblo, Ariz., by Dr. J. Walter Fewkes during the summer of 1926.

PROPERTY

Office equipment was purchased to the amount of \$123.74.

MISCELLANEOUS

Clerical.—The correspondence and other clerical work of the office has been conducted by Miss May S. Clark, clerk to the chief, assisted by Mr. Anthony W. Wilding, stenographer. Miss Mae W. Tucker, stenographer, continued to assist Dr. John R. Swanton in compiling a Timucua dictionary and Mr. Hewitt in finishing the reclassifying and cataloguing of the manuscripts in the bureau archives. Miss Tucker was also engaged in classifying and cataloguing the musical records in the possession of the bureau. Mrs. Frances S. Nichols assisted the editor.

Personnel.—Dr. F. H. H. Roberts, jr., archeologist, was appointed on the staff of the bureau November 1, 1926.

Respectfully submitted.

J. WALTER FEWKES,

Chief, Bureau of American Ethnology.

Dr. C. G. ABBOT,

Acting Secretary, Smithsonian Institution.

APPENDIX 5

REPORT ON THE INTERNATIONAL EXCHANGES

SIR: I have the honor to submit the following report on the operations of the International Exchange Service during the fiscal year ending June 30, 1927:

The congressional appropriation allowed for the support of the system of international exchanges conducted under the direction of the Smithsonian Institution during the fiscal year 1927 was \$46,260, the same as for the year 1926. In addition, \$300 was allotted for printing and binding. The collections on account of repayments from governmental and other establishments amounted to \$5,947.24, making the total available resources for carrying on the service during the year, \$52,507.24.

The total number of packages handled was 590,879, an increase of 110,103 over the previous year. This is the largest increase in the number of packages handled during any one year since the organization of the service in 1850. Leaving out the period during and immediately after the close of the World War—when the number of packages handled fluctuated greatly owing to the suspension and resumption of shipments to certain countries—the other years in which there were unusually large increases in the number of packages passing through the service were 1909 (increase 25,777 packages), 1912 (increase 29,794 packages), and 1913 (increase 23,129 packages). The packages handled during the fiscal year 1927 weighed a total of 553,125 pounds, a decrease of 5,368 pounds.

The large number of packages handled during 1927 was in great measure due to the action of the United States Department of Agriculture in turning over to the exchange office many hundreds of small packages for distribution abroad that it formerly sent to their destinations by mail. That department toward the close of the fiscal year discontinued sending this material to the Institution and resumed its transmission by mail.

For statistical purposes the packages handled by the exchange service are divided into several classes. The number and weight of the packages in these classes are given in the following table:

	Packages		Weight	
	Sent	Received	Sent	Received
United States parliamentary documents sent abroad.....	220, 506	-----	<i>Pounds</i> 94, 955	<i>Pounds</i> -----
Publications received in return for parliamentary documents.....	-----	6, 778	-----	23, 020
United States departmental documents sent abroad.....	219, 131	-----	152, 078	-----
Publications received in return for departmental documents.....	-----	5, 646	-----	23, 940
Miscellaneous scientific and literary publications sent abroad.....	106, 786	-----	182, 036	-----
Miscellaneous scientific and literary publications received from abroad for distribution in the United States.....	-----	32, 032	-----	77, 096
Total.....	546, 423	44, 456	429, 069	124, 056
Grand total.....	590, 879		553, 125	

Last year 43,783 packages were received from abroad, a substantial gain over the previous year in the number of packages received from foreign countries. During the past 12 months, as shown in the above table, there was a further gain in the number of packages received from abroad.

Mr. Vittorio Benedetti, chief of the Italian exchange office in Rome for the past 13 years, severed his connection with that office on June 30, 1926, and was succeeded by Dr. Guglielmo Passigli, who is one of the librarians of the Victor Emanuel National Library, under the direction of which the Italian exchange office is conducted. Dr. Passigli has been succeeded since by Dr. Vincenzo Fago as director of the Italian exchange office. The Institution desires to record here its appreciation of the valuable services rendered the Smithsonian by Mr. Benedetti, not only in his regular duties as chief of the exchange office, but in his painstaking efforts to procure copies of Italian official publications for the Library of Congress in exchange for the full series of United States governmental documents sent to Italy. To what extent the services of Mr. Benedetti were valued by correspondents in his own country may be inferred from the following extract from a letter addressed to Mr. Benedetti by an official of the Library of American Studies in Italy:

It is with keen regret that I learn that you have left the exchange office where for so many years you have rendered such courteous and efficient service in promoting close intellectual relations between Italy and other countries. The Library of American Studies found in you a sincere friend and your counsel was most helpful to us when our organization was in its formative period.

Mr. Benedetti's interest in the exchange service at large was so great that shortly after his appointment as chief of the Italian Office of International Exchanges he made a study of the origin and de-

velopment of the exchanges and wrote an account thereof, a copy of the manuscript of which he presented to the Institution. So far as this office is aware, the work was not published, although it contains much valuable information concerning the exchange service in general, giving special attention to the Italian exchanges.

The officials of many other exchange bureaus likewise are rendering great service to the cause of science and learning through their long connection with the exchange service and their devotion to the work of the diffusion of knowledge among men.

Although the Smithsonian Institution can not undertake to obtain copies of all publications desired by the large number of correspondents making use of the service, it endeavors to meet these requests as far as it is practicable. It is desirable, however, that correspondents themselves take steps to make application for publications they desire whenever it is possible to do so. Among the requests made during the year for assistance in obtaining books was one received through the Austrian Exchange Agency from the botanical department of the Natural History Museum in Vienna for certain American publications bearing on botany. The Institution brought the request to the attention of the proper organizations, and although only a part of the publications desired were received, the director of the botanical department expressed his great appreciation of the action taken by the Institution in the matter.

The total number of boxes required in dispatching exchange consignments abroad during the year was 2,608, an increase of 87 over the number for the preceding year.

Prior to 1926 it was the practice of the Institution to forward the full series of official documents to depositories at quarterly intervals. In April of that year that practice was discontinued, and shipments to the depositories have since been made about once a month. This change, as was stated in my last report, was made in order to comply with the request of several depositories that steps be taken to have the publications forming the regular series of governmental documents delivered more promptly, so that the information contained therein would be available for use as shortly after publication as practicable. These frequent shipments account for the increase of 230 in the number of boxes sent to the depositories—619 in 1927 as compared with 389 in 1926.

It is the usual custom of the Institution to send exchange packages to foreign distributing agencies in boxes by freight. However, in cases where the packages that accumulate for a particular country are not of sufficient bulk to warrant their transmission in that manner, they are mailed directly to their destinations without passing

through the foreign agencies. Packages bearing addresses in remote places which can not be reached through existing exchange bureaus also are forwarded by mail. The number of packages mailed in 1927 was 62,432—an increase of 13,345 over the number posted during the previous year. The forwarding of this large number of packages by mail required an expenditure for postage during the year of \$3,000.

The number of boxes sent to each country during the fiscal year 1927 is given in the following table:

Consignments of exchanges forwarded to foreign countries

Country	Number of boxes	Country	Number of boxes
Argentina.....	57	Mexico.....	11
Austria.....	54	Netherlands.....	77
Belgium.....	65	New South Wales.....	33
Brazil.....	38	New Zealand.....	19
British colonies.....	18	Norway.....	49
Canada.....	44	Palestine.....	33
Chile.....	23	Peru.....	21
China.....	58	Poland.....	42
Colombia.....	22	Portugal.....	25
Costa Rica.....	18	Queensland.....	22
Cuba.....	11	Rumania.....	13
Czechoslovakia.....	64	Russia.....	139
Danzig.....	5	South Australia.....	23
Denmark.....	52	Spain.....	37
Egypt.....	2	Sweden.....	78
Estonia.....	20	Switzerland.....	72
Finland.....	10	Tasmania.....	19
France.....	184	Union of South Africa.....	36
Germany.....	352	Uruguay.....	21
Great Britain and Ireland.....	326	Venezuela.....	19
Greece.....	21	Victoria.....	50
Hungary.....	40	Western Australia.....	25
India.....	57	Yugoslavia.....	17
Italy.....	103		
Japan.....	82	Total.....	2,608
Lithuania.....	1		

FOREIGN DEPOSITORIES OF UNITED STATES GOVERNMENTAL DOCUMENTS

In accordance with the terms of the convention concluded at Brussels in March, 1886, and under authority granted by Congress in resolutions approved March 2, 1867, March 2, 1901, and March 3, 1925, there are now forwarded abroad to certain designated depositories 103 sets of United States governmental documents—60 of which are full and 43 partial sets. This is an increase of two during the past fiscal year, partial sets being sent to Lithuania and to the State of Minas Geraes, Brazil.

Information was received during the year that China and Egypt had adhered to both of the Brussels exchange conventions. Since 1908 a full set of governmental documents has been sent to the American Chinese Publication Exchange Department of the Shanghai Bureau of Foreign Affairs. When China joined the convention it requested that the depository be changed to the Metropolitan Library in Peking.

Since 1905 a partial set of governmental documents has been forwarded to Egypt, but now that that country has become a party to the convention, the set has been increased to a full one. The depository formerly was the Royal Library, but, at the request of the Egyptian Government, it has been changed to the Bureau of Publications of the Ministry of Finances.

At the request of the New Zealand depository—the General Assembly Library—the full set of governmental documents that had been forwarded to that country since 1876 was changed last year to a partial set. In compliance with a later request, the depository has again been listed to receive a full set.

A list of the foreign depositories is given below:

DEPOSITORIES OF FULL SETS

- ARGENTINA: Ministerio de Relaciones Exteriores, Buenos Aires.
 BUENOS AIRES: Biblioteca de la Universidad Nacional de La Plata, La Plata. (Depository of the Province of Buenos Aires.)
- AUSTRALIA: Library of the Commonwealth Parliament, Canberra.
 NEW SOUTH WALES: Public Library of New South Wales, Sydney.
 QUEENSLAND: Parliamentary Library, Brisbane.
 SOUTH AUSTRALIA: Parliamentary Library, Adelaide.
 TASMANIA: Parliamentary Library, Hobart.
 VICTORIA: Public Library of Victoria, Melbourne.
 WESTERN AUSTRALIA: Public Library of Western Australia, Perth.
- AUSTRIA: Bundesamt für Statistik, Schwarzenbergstrasse 5, Vienna I.
- BELGIUM: Bibliothèque Royale, Brussels.
- BRAZIL: Bibliotheca Nacional, Rio de Janeiro.
- CANADA: Library of Parliament, Ottawa.
 MANITOBA: Provincial Library, Winnipeg.
 ONTARIO: Legislative Library, Toronto.
 QUEBEC: Library of the Legislature of the Province of Quebec, Quebec.
- CHILE: Biblioteca del Congreso Nacional, Santiago.
- CHINA: Metropolitan Library, Pei Hai, Peking.
- COLOMBIA: Bibliotheca Nacional, Bogotá.
- COSTA RICA: Oficina de Depósito y Canje Internacional de Publicaciones, San José.
- CUBA: Secretaría de Estado (Asuntos Generales y Canje Internacional), Habana.
- CZECHOSLOVAKIA: Bibliothèque de l'Assemblée Nationale, Prague.
- DENMARK: Kongelige Bibliotheket, Copenhagen.
- EGYPT: Bureau des Publications, Ministère des Finances, Cairo.

ESTONIA: Riigiraamatukogu (State Library), Reval.

FRANCE: Bibliothèque Nationale, Paris.

PARIS: Préfecture de la Seine.

GERMANY: Deutsche Reichstags-Bibliothek, Berlin.

BADEN: Universitäts-Bibliothek, Freiburg. (Depository of the State of Baden.)

BAVARIA: Staats-Bibliothek, Munich.

PRUSSIA: Preussische Staatsbibliothek, Berlin, N. W. 7.

SAXONY: Sächsische Landesbibliothek, Dresden—N. 6.

WURTEMBERG: Landesbibliothek, Stuttgart.

GREAT BRITAIN:

ENGLAND: British Museum, London.

GLASGOW: City Librarian, Mitchell Library, Glasgow.

LONDON: London School of Economics and Political Science. (Depository of the London County Council.)

GREECE: Bibliothèque Nationale, Athens.

HUNGARY: Hungarian House of Delegates, Budapest.

INDIA: Imperial Library, Calcutta.

IRISH FREE STATE: National Library of Ireland, Dublin.

ITALY: Biblioteca Nazionale Vittorio Emanuele, Rome.

JAPAN: Imperial Library of Japan, Tokyo.

MEXICO: Biblioteca Nacional, Mexico, D. F.

NETHERLANDS: Bibliotheek van de Tweede Kamer der Staten-Generaal, The Hague.

NEW ZEALAND: General Assembly Library, Wellington.

NORTHERN IRELAND: Ministry of Finance, Belfast.

NORWAY: Universitets-Bibliotek, Oslo. (Depository of the Government of Norway.)

PERU: Biblioteca Nacional, Lima.

POLAND: Bibliothèque du Ministère des Affaires Étrangères, Warsaw.

PORTUGAL: Bibliotheca Nacional, Lisbon.

RUSSIA: Shipments temporarily suspended.

SPAIN: Servicio del Cambio Internacional de Publicaciones. Cuerpo Facultativo de Archiveros, Bibliotecarios y Arqueólogos, Madrid.

SWEDEN: Kungliga Biblioteket, Stockholm.

SWITZERLAND: Bibliothèque Centrale Fédérale, Berne.

SWITZERLAND: Library of the League of Nations, Geneva.

TURKEY: Shipments temporarily suspended.

UNION OF SOUTH AFRICA: State Library, Pretoria, Transvaal.

URUGUAY: Oficina de Canje Internacional de Publicaciones, Montevideo.

VENEZUELA: Biblioteca Nacional, Caracas.

YUGOSLAVIA: Ministère des Affaires Étrangères, Belgrade.

DEPOSITORIES OF PARTIAL SETS

AUSTRIA:

VIENNA: Magistrat der Stadt.

BOLIVIA: Ministerio de Colonización y Agricultura, La Paz.

BRAZIL:

MINAS GERAES: Directória Geral de Estatística em Minas, Bello Horizonte, Minas Geraes.

RIO DE JANEIRO: Bibliotheca da Assembleia Legislativa do Estado, Nictheroy.

CANADA:

ALBERTA: Provincial Library, Edmonton.

BRITISH COLUMBIA: Legislative Library, Victoria.

CANADA—Continued.

NEW BRUNSWICK: Legislative Library, Fredericton.

NOVA SCOTIA: Provincial Secretary of Nova Scotia, Halifax.

PRINCE EDWARD ISLAND: Legislative Library, Charlottetown.

SASKATCHEWAN: Government Library, Regina.

BRITISH GUIANA: Government Secretary's Office, Georgetown, Demerara.

BULGARIA: Ministère des Affaires Étrangères, Sofia.

CEYLON: Colonial Secretary's Office (Record Department of the Library), Colombo.

DANZIG: Stadtbibliothek, Free City of Danzig.

DOMINICAN REPUBLIC: Biblioteca del Senado, Santo Domingo.

ECUADOR: Biblioteca Nacional, Quito.

FINLAND: Parliamentary Library, Helsingfors.

FRANCE:

ALSACE-LORRAINE: Bibliothèque Universitaire et Régionale de Strasbourg, Strasbourg.

GERMANY:

BREMEN: Senatskommission für Reichs- und Auswärtige Angelegenheiten.

HAMBURG: Senatskommission für die Reichs- und Auswärtigen Angelegenheiten.

HESSE: Landesbibliothek, Darmstadt.

LÜBECK: President of the Senate.

THURINGIA: Rothenberg-Bibliothek, Landesuniversität, Jena.

GUATEMALA: Secretary of the Government, Guatemala.

HAITI: Secrétaire d'Etat des Relations Extérieures, Port au Prince.

HONDURAS: Secretary of the Government, Tegucigalpa.

ICELAND: National Library, Reykjavik.

INDIA:

MADRAS: Chief Secretary to the Government of Madras, Public Department, Madras.

UNITED PROVINCES OF AGRA AND OUDH: University of Allahabad, Allahabad.

JAMAICA: Colonial Secretary, Kingston.

LATVIA: Bibliothèque d'Etat, Riga.

LIBERIA: Department of State, Monrovia.

LITHUANIA: Ministère des Affaires Étrangères, Kovno.

LOUBENÇO MARQUEZ: Government Library, Lourenço Marquez.

MALTA: Minister for the Treasury, Valetta.

NEFOUNDLAND: Colonial Secretary, St. John's.

NICARAGUA: Superintendente de Archivos Nacionales, Managua.

PANAMA: Secretaría de Relaciones Exteriores, Panama.

PARAGUAY: Sección Canje Internacional de Publicaciones del Ministerio de Relaciones Exteriores, Estrella 563, Asunción.

RUMANIA: Academia Romana, Bucharest.

SALVADOR: Ministerio de Relaciones Exteriores, San Salvador.

SIAM: Department of Foreign Affairs, Bangkok.

STRAITS SETTLEMENTS: Colonial Secretary, Singapore.

INTERPARLIAMENTARY EXCHANGE OF OFFICIAL JOURNAL

During the past fiscal year 24 new foreign depositories were added to the list of those receiving the daily issue of the Congressional Record. The new depositories are located in the following places: Brazil—States of Amazonas, Espirito Santo, São Paulo, São Sal-

vador: Egypt: Germany—States of Mecklenburg-Schwerin, Mecklenburg-Strelitz, Schaumburg-Lippe; Gibraltar; Iraq; Mexico—States of Campeche, Chiapas, Guanajuato, Querétaro, Mexico, Michoacán, Morelos, Nayarit, Oaxaca, Puebla, Tlaxcala; Spain—Province of Barcelona; Syria—State of Alaouites, and République Libanaise.

The total number of copies of the daily issue of the Congressional Record now forwarded abroad through the Institution is 99. A complete list of the States taking part in this exchange, together with the names of the establishments to which the Record is mailed, is given below:

DEPOSITORIES OF CONGRESSIONAL RECORD

ARGENTINA:

Biblioteca del Congreso Nacional, Buenos Aires.

Cámara de Diputados, Oficina de Información Parlamentaria, Buenos Aires.

Buenos Aires: Biblioteca del Senado de la Provincia de Buenos Aires, La Plata.

AUSTRALIA:

Library of the Commonwealth Parliament, Canberra.

New South Wales: Library of Parliament of New South Wales, Sydney.

Queensland: Chief Secretary's Office, Brisbane.

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

AUSTRIA: Bibliothek des Nationalrates, Vienna I.

BELGIUM: Bibliothèque de la Chambre des Représentants, Brussels.

BOLIVIA: Cámara de Diputados, Congreso Nacional, La Paz.

BRAZIL:

Bibliotheca do Congresso Nacional, Rio de Janeiro.

Amazonas: Archivo, Bibliotheca e Imprensa Publica, Manóos.

Espirito Santo: Presidencia do Estado do Espirito Santo, Victoria.

São Paulo: Bibliotheca Publica do Estado de São Paulo, São Paulo.

São Salvador: Governador do Estado de Bahia, São Salvador.

CANADA:

Library of Parliament, Ottawa.

Clerk of the Senate, Houses of Parliament, Ottawa.

CHINA: Metropolitan Library, Pei Hai, Peking.

COSTA RICA: Oficina de Depósito y Canje Internacional de Publicaciones, San José.

CUBA:

Biblioteca de la Cámara de Representantes, Habana.

Biblioteca del Senado, Habana.

CZECHOSLOVAKIA: Bibliothèque de l'Assemblée Nationale, Prague.

DANZIG: Stadtbibliothek, Danzig.

DENMARK: Rigsdagens Bureau, Copenhagen.

DOMINICAN REPUBLIC: Biblioteca del Senado, Santo Domingo.

DUTCH EAST INDIES: Volksraad van Nederlandsch-Indie, Batavia, Java.

EGYPT: Bureau des Publications, Ministère des Finances, Cairo.

ESTONIA: Riigiraamatukogu (State Library), Reval.

FRANCE:

Bibliothèque de la Chambre des Députés, au Palais Bourbon, Paris.

Bibliothèque du Sénat, au Palais du Luxembourg, Paris.

GERMANY:

- Deutsche Reichstags-Bibliothek, Berlin, N. W. 7.
 Anhalt: Anhaltische Landesbücherei, Dessau.
 Baden: Universitäts-Bibliothek, Heidelberg.
 Braunschweig: Bibliothek des Braunschweigischen Staatsministeriums, Braunschweig.
 Mecklenburg-Schwerin: Staatsministerium, Schwerin.
 Mecklenburg-Strelitz: Finanzdepartement des Staatsministeriums, Neustrelitz.
 Oldenburg: Oldenburgisches Staatsministerium, Oldenburg i. O.
 Prussia: Bibliothek des Abgeordnetenhauses, Prinz-Albrechtstrasse 15, Berlin, S. W. 11.
 Schaumburg-Lippe: Schaumburg-Lippische Landesregierung, Bieleburg.

GIBRALTAR: Gibraltar Garrison Library Committee, Gibraltar.

GREAT BRITAIN: Library of the Foreign Office, London.

GREECE: Library of Parliament, Athens.

GUATEMALA: Archivo General del Gobierno, Guatemala.

HAITI: Secrétaire d'Etat des Relations Extérieures, Port-au-Prince.

HONDURAS: Biblioteca del Congreso Nacional, Tegucigalpa.

HUNGARY: Bibliothek des Abgeordnetenhauses, Budapest.

INDIA: Legislative Department, Simla.

ITALY:

Biblioteca del Senato del Regno, Rome.

Biblioteca della Camera dei Deputati, Rome.

IRAQ: Chamber of Deputies, Baghdad, Iraq (Mesopotamia).

LATVIA: Library of the Saeima, Riga.

LIBERIA: Department of State, Monrovia.

MEXICO: Mexico, Secretaria de la Cámara de Diputados, Mexico, D. F.

Aguascalientes: Gobernador del Estado de Aguascalientes, Aguascalientes.

Campeche: Gobernador del Estado de Campeche, Campeche.

Chihuahua: Gobernador del Estado de Chihuahua, Chihuahua.

Chiapas: Gobernador del Estado de Chiapas, Tuxtla Gutierrez.

Coahuila: Periódico Oficial del Estado de Coahuila, Palacio de Gobierno, Saltillo.

Colima: Gobernador del Estado de Colima, Colima.

Durango: Gobernador Constitucional del Estado de Durango, Durango.

Guanajuato: Secretaría General de Gobierno del Estado, Guanajuato.

Guerrero: Gobernador del Estado de Guerrero, Chilpancingo.

Jalisco: Biblioteca del Estado, Guadalajara.

Lower California: Gobernador del Distrito Norte, Mexicali, B. C., Mexico.

Mexico: Gaceta del Gobierno, Toluca, Mexico.

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, Monterey.

Oaxaca: Periódico Oficial, Palacio de Gobierno, Oaxaca.

Puebla: Secretario General de Gobierno, Zaragoza.

Queretaro: Secretaría General de Gobierno, Sección de Archivo, Queretaro.

San Luis Potosi: Congreso del Estado, San Luis Potosi.

Sinaloa: Gobernador del Estado de Sinaloa, Culiacan.

MEXICO—Continued.

Sonora: Gobernador del Estado de Sonora, Hermosillo.

Tabasco: Secretaría General de Gobierno, Sección 3a, Ramo de Prensa, Villahermosa.

Tamaulipas: Secretaria General de Gobierno, Victoria.

Tlaxcala: Secretaría de Gobierno del Estado, Tlaxcala.

Vera Cruz: Gobernador del Estado de Vera Cruz, Departamento de Gobernación y Justicia, Jalapa.

Yucatán: Gobernador del Estado de Yucatán, Mérida, Yucatán.

NEW ZEALAND: General Assembly Library, Wellington.

PERU: Cámara de Diputados, Congreso Nacional, Lima.

NORWAY: Storthingets Bibliothek, Oslo.

POLAND: Ministère des Affaires Étrangères, Warsaw.

PORTUGAL: Bibliotheca do Congresso da Republica, Lisbon.

RUMANIA:

Bibliothèque de la Chambre des Députés, Bucharest.

Ministère des Affaires Étrangères, Bucharest.

SPAIN:

Biblioteca del Senado, Madrid.

Biblioteca del Congreso de los Diputados, Madrid.

Barcelona: Biblioteca de la Comisión Permanente Provincial de Barcelona, Barcelona.

SWITZERLAND:

Bibliothèque de l'Assemblée Fédérale Suisse, Berne.

Library of the League of Nations, Geneva.

SYRIA:

Ministère des Finances de la République Libanaise, Service du Matériel, Beirut.

Governor of the State of Alaouites, Lattaquié.

UNION OF SOUTH AFRICA:

Library of Parliament, Cape Town, Cape of Good Hope.

State Library, Pretoria, Transvaal.

URUGUAY: Biblioteca de la Cámara de Representantes, Montevideo

VENEZUELA: Cámara de Diputados, Congreso Nacional, Carácas.

YUGOSLAVIA: Library of the Skupshtina, Belgrade.

FOREIGN EXCHANGE AGENCIES

Egypt having joined the Brussels Exchange Convention, as previously stated in this report, the Egyptian Government, in compliance with the stipulations set forth in Article I of the convention, established the Bureau of Publications in the Ministry of Finances at Cairo to act as the exchange agency for that country.

The exchange bureau in Yugoslavia was changed during the year from the Royal Serbian Academy to the Ministry of Foreign Affairs at Belgrade.

The Dutch Central Scientific Bureau, which acts as the exchange agency for the Netherlands, has been conducted under the direction of various scientific organizations, the bureau being since January, 1920, under the Library of the Technical Academy at Delft. The

Dutch Government has now made the Central Scientific Bureau a subdivision of the Federal organization, and has placed it under the Royal Library at The Hague, the transfer to take place on January 1, 1928.

A complete list of the foreign exchange agencies or bureaus is given below. Those agencies in the larger countries and many of those in the smaller countries forward consignments to the Smithsonian Institution for distribution in the United States. Correspondents desiring to make use of any of the exchange agencies in the transmission of packages to the United States should first communicate with the respective bureau in order to ascertain whether the bureau sends consignments to this country.

LIST OF EXCHANGE AGENCIES

- ALGERIA, via France.
- ANGOLA, via Portugal.
- ARGENTINA: Comisión Protectora de Bibliotecas Populares, Calle Córdoba 931, Buenos Aires.
- AUSTRIA: Bundesamt für Statistik, Schwarzenbergstrasse 5, Vienna I.
- AZORES, via Portugal.
- BELGIUM: Service Belge des Echanges Internationaux, Rue des Longs-Chariots, 46, Brussels.
- BOLIVIA: Oficina Nacional de Estadística, La Paz.
- BRAZIL: Serviço de Permutações Internacionaes, Bibliotheca Nacional, Rio de Janeiro.
- BRITISH COLONIES: Crown Agents for the Colonies, London.
- BRITISH GUIANA: Royal Agricultural and Commercial Society, Georgetown.
- BRITISH HONDURAS: Colonial Secretary, Belize.
- BULGARIA: Institutions Scientifiques de S. M. le Roi de Bulgarie, Sofia.
- CANARY ISLANDS, via Spain.
- CHILE: Servicio de Canjes Internacionales, Biblioteca Nacional, Santiago.
- CHINA: Bureau of International Exchange of Publications, Ministry of Education, Peking.
- COLOMBIA: Oficina de Canjes Internacionales y Reparto, Biblioteca Nacional, Bogotá.
- COSTA RICA: Oficina de Depósito y Canje Internacional de Publicaciones, San José.
- CZECHOSLOVAKIA: Service Tchecoslovaque des Échanges Internationaux, Bibliothèque de l'Assemblée Nationale, Prague 1-79.
- DANZIG: Amt für den Internationalen Schriftenaustausch der Freien Stadt Danzig, Stadtbibliothek, Danzig.
- DENMARK: Kongelige Danske Videnskabernes Selskab, Copenhagen.
- DUTCH GUIANA: Surinaamsche Koloniale Bibliotheek, Paramaribo.
- ECUADOR: Ministerio de Relaciones Exteriores, Quito.
- EGYPT: Bureau des Publications, Ministère des Finances, Cairo.
- ESTONIA: Riigiraamatukogu (State Library), Reval.
- FINLAND: Delegation of the Scientific Societies of Finland, Helsingfors.
- FRANCE: Service Français des Échanges Internationaux, 110 Rue de Grenelle, Paris.
- GERMANY: Amerika-Institut, Universitätstrasse 8, Berlin, N. W. 7.

- GREAT BRITAIN AND IRELAND: Messrs. Wheldon & Wesley, 2, 3, and 4 Arthur St., New Oxford St., London W. C. 2.
- GREECE: Bibliothèque Nationale, Athens.
- GREENLAND, via Denmark.
- GUATEMALA: Instituto Nacional de Varones, Guatemala.
- HAITI: Secrétaire d'État des Relations Extérieures, Port-au-Prince.
- HONDURAS: Biblioteca Nacional, Tegucigalpa.
- HUNGARY: Service Hongrois des Échanges Internationaux, Musée National Budapest, VIII.
- ICELAND, via Denmark.
- INDIA: Superintendent of Stationery, Bombay.
- ITALY: Ufficio degli Scambi Internazionali, Biblioteca Nazionale Vittorio Emanuele, Rome.
- JAMAICA: Institute of Jamaica, Kingston.
- JAPAN: Imperial Library of Japan, Tokyo.
- JAVA, via Netherlands.
- KOREA: Government General, Seoul.
- LATVIA: Service des Échanges Internationaux, Bibliothèque d'État de Lettonie, Riga.
- LIBERIA: Bureau of Exchanges, Department of State, Monrovia.
- LITHUANIA: Sent by mail.
- LOURENÇO MARQUEZ, via Portugal.
- LUXEMBURG, via Belgium.
- MADAGASCAR, via France.
- MADEIRA, via Portugal.
- MOZAMBIQUE, via Portugal.
- NETHERLANDS: Bureau Scientifique Central Néerlandais, Bibliothèque de l'Académie Technique, Delft. (Beginning January 1, 1928, this bureau will be under the Royal Library at the Hague.)
- NEW SOUTH WALES: Public Library of New South Wales, Sydney.
- NEW ZEALAND: Dominion Museum, Wellington.
- NICARAGUA: Ministerio de Relaciones Exteriores, Managua.
- NORWAY: Universitets-Bibliotek, Oslo.
- PALESTINE: Hebrew University Library, Jerusalem.
- PANAMA: Sent by mail.
- PARAGUAY: Sección Canje Internacional de Publicaciones del Ministerio de Relaciones Exteriores, Estrella 563, Asunción.
- PERU: Oficina de Reparto, Depósito y Canje Internacional de Publicaciones. Ministerio de Fomento, Lima.
- POLAND: Service Polonais des Échanges Internationaux, Bibliothèque du Ministère des Affaires Étrangères, Warsaw.
- PORTUGAL: Seccão de Trocas Internacionaes, Bibliotheca Nacional, Lisbon.
- QUEENSLAND: Bureau of Exchanges of International Publications, Chief Secretary's Department, Brisbane.
- RUMANIA: Bureau des Échanges Internationaux, Institut Météorologique Central, Bucharest.
- RUSSIA: Academy of Sciences, Leningrad.
- SALVADOR: Ministerio de Relaciones Exteriores, San Salvador.
- SIAM: Department of Foreign Affairs, Bangkok.
- SOUTH AUSTRALIA: Public Library of South Australia, Adelaide.
- SPAIN: Servicio del Cambio Internacional de Publicaciones, Cuerpo Facultativo de Archiveros, Bibliotecarios y Arqueólogos, Madrid.

SUMATRA, via Netherlands.

SWEDEN: Kongliga Svenska Vetenskaps Akademien, Stockholm.

SWITZERLAND: Service Suisse des Échanges Internationaux, Bibliothèque Centrale Fédérale, Berne.

SYRIA: American University of Beirut.

TASMANIA: Secretary to the Premier, Hobart.

TRINIDAD: Royal Victoria Institute of Trinidad and Tobago, Port-of-Spain.

TUNIS, via France.

TURKEY: Robert College, Constantinople.

UNION OF SOUTH AFRICA: Government Printing Works, Pretoria, Transvaal.

URUGUAY: Oficina de Canje Internacional de Publicaciones, Montevideo.

VENEZUELA: Biblioteca Nacional, Carácas.

VICTORIA: Public Library of Victoria, Melbourne.

WESTERN AUSTRALIA: Public Library of Western Australia, Perth.

YUGOSLAVIA: Ministère des Affaires Étrangères, Belgrade.

Respectfully submitted.

C. G. ABBOT,

Assistant Secretary,

In Charge of Library and Exchanges.

To the ACTING SECRETARY,

SMITHSONIAN INSTITUTION.

APPENDIX 6

REPORT ON THE NATIONAL ZOOLOGICAL PARK

SIR: I have the honor to submit the following report on the operations of the National Zoological Park for the fiscal year ending June 30, 1927:

The appropriation made by Congress for the regular maintenance of the park was \$173,199 and there was the usual allotment of \$300 for printing and binding. Of this \$124,330 was expended for salaries and labor in connection with the maintenance of the park, and \$28,200 for the purchase of food for the animals.

The collection of animals on exhibition has been considerably increased this year by gifts, purchases, and through original collections made on the Smithsonian-Chrysler Expedition.

ACCESSIONS

There were added to the park by gift or deposit 180 specimens from 99 different donors.

Notable among these is the pigmy hippopotamus presented by Mr. Harvey S. Firestone, of Akron, Ohio, to President Coolidge, and a fine pair of South African lion cubs, presented to the President by the mayor and citizens of Johannesburg, South Africa, and deposited in the national collection. The pigmy hippopotamus is the first of the species ever to be exhibited in the park and the lions fill the long-felt want for new blood in the lion collection. Mr. Victor Evans deposited a splendid specimen of the great anteater which is doing remarkably well.

Mr. J. Delacour, of Clères, France, the noted French aviculturist who visited the National Zoological Park on a trip made through the States, presented to the collection a male of the very rare Edward's pheasant.

The largest addition to the collection ever made at one time was collected and brought to Washington by the Smithsonian-Chrysler expedition to Tanganyika Territory. This expedition was made possible through the generosity of Mr. Walter Chrysler, the automobile manufacturer, who presented the Smithsonian Institution with funds for the work. The party consisted of Dr. W. M. Mann; Mr. Arthur Loveridge, of the Museum of Comparative Zoölogy, at Cambridge; Mr. Stephen Haweis and Mr. F. G. Carnochan, of New York City. The latter two were volunteer workers, and in addition Mr. Carnochan paid his own expenses to and from Africa.

The Pathé Review sent with the party Mr. Charles Charlton to make a pictorial chronicle of the work of the expedition. The trip lasted from March to October, and four months were spent in the field collecting animals.

Before starting, a number of take-down crates for the carriage of larger animals were made at the shops in the park, under the direction of Mr. W. H. Blackburne. These proved invaluable in the field. The United States Marine Corps supplied part of the field supplies and the Freedmen's Hospital the necessary medicines.

On arrival at Dar-es-Salaam, His Excellency Sir Donald Cameron, Governor of Tanganyika, presented a license for the collection of animals and gave instructions to various civil officers to assist the party in its work. In the field the expedition engaged Mr. George Runton and afterwards Mr. Charles Goss, both well known African hunters, as guides and interpreters. Headquarters were made at Dodoma, 250 miles inland where Mr. Loveridge maintained the base camp. Mr. Carnochan went farther west to Tabora, Mr. Haweis, to Mhonde, and Doctor Mann spent a great deal of time on "safari" visiting the region about Lake Manyara and afterwards farther south, the Tula district. At the end of four months, the party embarked with the collection and returned to the States, via Colombo, arriving at the port of Boston October 24, having suffered comparatively small loss among the animals en route.

Among the animals secured, numbers were new to the collection. Among these, giraffe, white-bearded gnu, impalla, reed buck, and long-eared fox had never before been exhibited in the park. A male greater kudu, a female eland (the latter obtained through the efforts of the game warden, Mr. C. F. M. Swynnerton), a quartet of wart hogs, five leopards, five hyenas, ratel, and civet cats fill long-felt gaps in the collection. Among the 70 monkeys brought home were a group of five blue monkeys, a very rare and desirable species, and five purple-faced monkeys, both of these new to the history of our Zoo. From the Sudan Government was secured a splendid specimen of a shoebill stork, the second to arrive in America and the first in Washington.

There was a good series of smaller mammals, such as porcupines, hedgehogs, genets, five species of mongoose, jackals, etc.

Quantities of birds were brought home, among these a troop of six crowned cranes and two rare species of lovebirds, *Agapornis personata* and *Agapornis fischeri*, one of them unique in American collections.

Because of the lack of facilities at the park for housing them, no especial attempt was made to get reptiles in quantities, but a dozen African rock pythons, very rare in American collections,

black spitting cobras, Egyptian cobras, and boomslangs were secured, as well as the curious soft-shelled tortoises and also a cage of 50 chameleons, which made a most attractive exhibit.

During the course of the expedition a series of radio talks were given at station WRC through arrangement by A. H. Clark so that the public was kept informed on the progress of the party.

The expedition is indebted to the Governor of Tanganyika for his generous license to collect, to Messrs. C. F. M. Swynnerton, chief of the Tanganyika game department, to George Runton and Charles Goss, and to the Ellerman Steamship Line, to the officers and men of the steamships *Crewe Hall* and *City of Calcutta* for the great consideration they showed the party and its cargo of animals on its voyage home, and to Mr. John T. Benson, of Nashua, N. H., United States agent for Hagenbeck Bros., whose help at Boston greatly facilitated the landing of the collection.

Since returning from Africa, the director has given a series of about 50 lectures on the expedition, illustrated by moving pictures, which were kindly furnished by the Pathé Review.

GIFTS

- Mr. H. H. Adams, Washington, D. C., ocelot.
 Miss Corinne Allison, Washington, D. C., red fox.
 American Consul, Trinidad, West Indies, peccary.
 Mr. Robert Anderson, Washington, D. C., Cuban parrot.
 Miss Bessie K. Arnold, Culpeper, Va., alligator.
 Mr. Vernon Bailey, Washington, D. C., two desert turtles.
 Mr. Herbert Barber, Washington, D. C., least bittern.
 Dr. Thomas Barbour, Cambridge, Mass., two spotted turtles.
 Mr. H. G. Bartsch, Washington, D. C., two European hedgehogs.
 Mrs. L. B. Batkins, Richmond, Va., two orange-winged parrots.
 Mr. Dick Binckel, Washington, D. C., four horned toads.
 Mr. J. K. Bishop, Washington, D. C., double yellow-head parrot.
 Commander G. E. Brandt, United States Navy, two comb lizards.
 Lieut. W. K. Burgess, United States Army, Manila, P. I., 2 jungle fowls,
 5 bleeding heart doves, 2 green-winged doves, 2 Java sparrows, 2 black-headed
 nun, 2 hanging paroquets.
 California Academy of Sciences, three leopard seals.
 Mr. R. S. Cardon, Washington, D. C., raccoon.
 Mr. F. G. Carnochan, New York City, two wood turtles.
 Mr. J. C. Carter, Washington, D. C., three canaries.
 Mr. F. M. Clark, Washington, D. C., red fox.
 Mrs. E. Cocksell, Washington, D. C., double-yellow-head parrot.
 President Coolidge, White House, two lions, pigmy hippopotamus.
 Mrs. Calvin Coolidge, White House, four paroquets, one duiker.
 Mr. E. L. Crandall, Washington, D. C., margay.
 Mr. W. G. Cunningham, Washington, D. C., gray fox.
 Mr. H. A. Daniel, Orange, Va., red-tailed hawk.
 Mr. J. J. Daniels, Washington, D. C., two alligators.
 Mr. A. H. Davin, Palmyra, Va., red fox

- Mr. H. F. Davison, Washington, D. C., Cuban parrot.
Mr. J. Delacour, Clères, France, Edward's pheasant.
Mr. Milton Derrick, Takoma Park, Md., barred owl.
Mrs. N. Eckhardt, Washington, D. C., ring-neck pheasant.
Mr. F. G. Ellison, Brentwood, Md., two turkey vultures.
Mr. Victor Evans, Washington, D. C., great anteater.
Mr. H. E. Ewing, Washington, D. C., copperhead snake.
U. S. Experiment Farm, Beltsville, Md., great horned owl.
Mr. C. L. Fagan, Rahway, N. J., white-crowned pigeon.
Mrs. J. Farley, Washington, D. C., two grass paroquets.
Mr. C. C. Fisher, Middleburg, Va., banded rattlesnake.
Mr. Edward Foutz, Washington, D. C., skunk.
Mr. F. M. Gaige, Ann Arbor, Mich., Blanding's terrapin.
Dr. Gavlin, Washington, D. C., pied-billed grebe.
Mr. F. P. Glover, Brentwood, Md., raccoon.
Mr. Granados, Washington, D. C., rough fox.
Mrs. Nancy Hall, Washington, D. C., alligator.
Mr. Oddie Hallson, Bethel, Alaska, three emperor geese.
Mr. R. L. Harrison, Garrett Park, Md., two yellow-fronted parrots.
Mrs. Henderson, Washington, D. C., orange-cheeked waxbill, black-faced finch.
Mrs. J. H. Himes, Washington, D. C., roseate cockatoo.
Mr. Albert Hochbaum, Washington, D. C., barred owl.
Mr. Carl H. Hubbs, University of Michigan, two leather-back terrapins, two Blandings terrapins, geographic terrapin.
Mr. J. A. Hyslop, Silver Spring, Md., great horned owl, two pilot snakes.
Messrs. J. A. & C. D. Hyslop & Stanny Rapley, Silver Spring, Md., two copper-head snakes.
Mr. James Jones, Washington, D. C., screech owl.
Mr. M. W. Knarr, Washington, D. C., marmoset.
Mr. Samuel Kress, Port Limon, Costa Rica, five three-toed sloths.
Lansburgh Sea Food Co., Washington, D. C., alligator.
Mr. Harrison Lee, Bastian, Va., banded rattlesnake.
Mrs. Miles A. Lehlig, McLean, Va., two mocking birds.
Mr. E. Lesche, Washington, D. C., Philippine macaque.
Mr. John C. Letts, Washington, D. C., snowy owl.
Mr. F. T. Lillie, Washington, D. C., barred owl.
Mr. C. Lindheimer, Washington, D. C., two gray-breasted paroquets.
Miss Pauline Marshall, Cocoa, Fla., barn owl.
Mr. E. C. Mateer, Park Lane, Va., alligator.
Mr. Stephen T. Mather, National Park Service, two cinnamon bears.
Mr. D. W. May, Mayaguez, P. R., horned iguana, Porto Rico boa.
Mr. J. R. McClintock, Washington, D. C., bald eagle.
Mrs. Royal Mead, Washington, D. C., two canaries.
Mr. George Mezitis, Washington, D. C., red-legged partridge.
Misses Alys and Helena Missirian, New Haven, Conn., sooty mangabey.
Mr. W. Lee Morris, Clarendon, Va., alligator.
Mr. E. E. Pabst, Washington, D. C., osprey.
Mr. E. R. Paiste, Berwyn, Pa., Canada porcupine.
Mrs. Pass, Washington, D. C., Tovi paroquet.
Mr. E. M. Perkins, Washington, D. C., banded rattlesnake.
Mr. Walter Peteet, Washington, D. C., marmoset.

Philadelphia Zoological Garden, Philadelphia, Pa., two Muhlenberg's turtles.
 W. Plesses Jungle Show, pine snake.
 Mr. E. D. Reid, Washington, D. C., blacksnake.
 Mr. Lowry Riggs, Rockville, Md., California boa.
 Mr. E. H. Sartain, Washington, D. C., woodchuck.
 Mrs. C. M. Saxelby, Washington, D. C., fire finch.
 Mr. W. Schaub, Fairfax, Va., great horned owl.
 Mr. E. S. Schmid, Washington, D. C., two woodchucks.
 Mr. H. Schriver, Cumberland, Md., five golden pheasants.
 Mr. Ernest T. Seton, Greenwich, Conn., 3 skunks, 1 opossum, 14 mallards.
 Mr. R. A. Shinn, Washington, D. C., diamond rattlesnake.
 Mr. T. W. Sine, Maurertown, Va., alligator.
 Mrs. Geo. B. Smith, Washington, D. C., red-shouldered hawk.
 Mrs. C. F. Spradling, Athens, Tenn., king snake.
 Mr. H. G. Stevens, Culpeper, Va., rhesus monkey.
 Mrs. C. A. Strange, Enterprise, Miss., barred owl.
 Mr. Swope, Chevy Chase, Md., pied-billed grebe.
 Miss Vivian Torovsky, Washington, D. C., yellow-naped parrot.
 Mr. J. G. Updike, Rosslyn, Va., great horned owl.
 United States Biological Survey, through G. E. Holman, one wolf.
 Mr. H. E. Waldron, Washington, D. C., Florida gallinule.
 Mrs. Robert M. Ward, Winchester, Va., great horned owl.
 Mrs. O. D. Wayland, Washington, D. C., two canaries.
 Unknown donors, great blue heron, woodchuck, osprey, turkey vulture.

In addition to animals presented to the park, the office of the Chief Coordinator has secured a considerable number of useful and valuable supplies and equipment for which the park authorities are deeply grateful.

Births.—During the year 104 mammals, birds, and reptiles were born and hatched in the park and added to the collection. Among the mammals born were fallow deer, Barasingha deer, European deer, sika deer, hog deer, American bison, tahr goat, Indian antelope, guanaco, agouti, paca, Rocky Mountain sheep, European brown bear, and rhesus monkey.

The Rocky Mountain sheep are especially interesting. The flock in the park at the close of the year numbered eight individuals, of which six were born in Washington and two of them from parents also born and raised in the park.

Exchanges.—The most important among the animals received in exchange were the Mongolian wild horse, mountain zebra, and six Humboldt penguins.

Purchases.—An anoa, a pair of Chapman zebras, an Indian caracal, a jaguarundi cat, a young snow leopard, a pair of barbary sheep, a pair of wallaroos, and a South American condor are the principal purchases of the year. We were especially fortunate in securing the snow leopard to fill the place of the one that had died the preceding year, which was the only specimen of this handsome and remarkable cat in captivity in the United States.

Removals.—One hundred and twenty-eight mammals, birds, and reptiles were sent away to other zoological gardens during the year. Among these were a pair of Philippine buffalo, various deer, some small mammals and birds and reptiles from the Smithsonian-Chrysler expedition.

Losses by death were mainly of animals that had been long in the collection or very recently received. Among the former was a Manchurian tiger, which lived in the park from June, 1918, to March 12, 1927; a cheetah received August 8, 1913, died February 17, 1927; a mountain sheep that had lived from September 18, 1917, to May 3, 1927; an eland received June 9, 1916, died August 22, 1926; a wild boar received September 10, 1911, died December 9, 1926; a northern wild cat received January 15, 1912, died January 28, 1927; a large male sea lion received August 29, 1916, and died June 13, 1927. Several of these have established long records for longevity in captivity but nevertheless leave great gaps in the collection.

One of a pair of Chapman zebras died through an accident, injuring himself by leaping into the fence. The Humboldt penguin died of aspergillosis.

The loss in the reptile collection has been larger than in other groups owing to lack of suitable quarters.

Post-mortem examinations were made in most cases by the pathological division of the Bureau of Animal Industry. The following list shows the results of autopsies, the cases being arranged by groups:

CAUSES OF DEATH

MAMMALS

Marsupialia: Pneumonia, 2; congestion of lungs, 1; enteritis, 1; infection of jaw, 1; no cause found, 1.

Carnivora: Tuberculosis, 2; congestion of lungs, 1; gastroenteritis, 3; intestinal parasites, 1; intestinal obstruction, 3; tumor, 1; softening of brain, 1.

Pinnipedia: Congestion of lungs, 1; gastroenteritis, 2.

Primates: Pneumonia, 1; enteritis, 2; gastroenteritis, 2; intestinal parasites, 1; nephritis, 1; streptococcic infection, 1; malnutrition, 1; no cause found, 2.

Artiodactyla: Pneumonia, 1; tuberculosis, 1; congestion of lungs, 1; gastroenteritis, 3; hepatitis, 1; nephritis, 1; necrophorus infection, 2; tumor, 1; accident, 2; old age, 3.

BIRDS

Struthioniformes: Aspergillosis, 1; peritonitis, 1.

Rheiformes: Egg-bound, 1; no cause found, 1.

Sphenisciformes: Pneumonia, 1; aspergillosis, 5.

Galliformes: Aspergillosis, 1; hepatitis, 1.

Psittaciformes: Enteritis, 2; no cause found, 1.

Passeriformes: Aspergillosis, 1; no cause found, 1.

The animals lost by death which were of value for museum purposes were transferred to the United States National Museum for preserva-

tion. In all, 244 specimens were sent. This does not include a number of Tanganyika specimens which died immediately upon arrival in Washington. A number of rare birds' eggs were also sent to the Museum.

A few mammals especially desired at the Johns Hopkins Medical School were sent, after death, to that institution.

ANIMALS IN THE COLLECTION JUNE 30, 1927

MAMMALS

MARSUPIALIA			
Virginia opossum (<i>Didelphis virginiana</i>)-----	2	Skunk (<i>Mephitis nigra</i>)-----	4
Tasmanian devil (<i>Sarcophilus harrisii</i>)--	1	American badger (<i>Taxidea taxus</i>)-----	2
Flying phalanger (<i>Petaurus breviceps</i>)--	5	Ratel (<i>Mellivora capensis</i>)-----	1
Brush-tailed rock wallaby (<i>Petrogale penicillata</i>)-----	1	Florida otter (<i>Lutra canadensis vaga</i>)--	3
Walleroo (<i>Macropus robustus</i>)-----	2	Indian civet (<i>Viverra zibetha</i>)-----	1
Wombat (<i>Phascolomys mitchelli</i>)-----	1	East African civet (<i>Viverra civetta orientalis</i>)-----	1
		Palm civet (<i>Paradoxurus hermaphroditus</i>)-----	2
CARNIVORA		Egyptian mongoose (<i>Herpestes ichneumon</i>)-----	1
Kadiak bear (<i>Ursus middendorffi</i>)-----	2	Banded mongoose (<i>Herpestes mungo colonus</i>)-----	1
Alaska Peninsula bear (<i>Ursus gyas</i>)--	4	Neumann's genet (<i>Genetta dongalana neumanni</i>)-----	4
Yakutat bear (<i>Ursus dalli</i>)-----	1	East African genet (<i>Genetta suaeholica</i>)-----	1
Kidder's bear (<i>Ursus kidderi</i>)-----	2	Aard-wolf (<i>Proteles cristatus</i>)-----	1
European bear (<i>Ursus arctos</i>)-----	8	Spotted hyena (<i>Crocuta crocuta</i>)-----	1
Grizzly bear (<i>Ursus horribilis</i>)-----	1	East African spotted hyena (<i>Crocuta crocuta germinans</i>)-----	5
Apache grizzly (<i>Ursus apache</i>)-----	1	Striped hyena (<i>Hyæna hyæna</i>)-----	1
Himalayan bear (<i>Ursus thibetanus</i>)--	1	African cheetah (<i>Acinonyx jubatus</i>)--	1
Black bear (<i>Euarctos americanus</i>)-----	4	Lion (<i>Felis leo</i>)-----	5
Cinnamon bear (<i>Euarctos americanus cinnamomum</i>)-----	4	Bengal tiger (<i>Felis tigris</i>)-----	1
Glacier bear (<i>Euarctos emmonsii</i>)-----	1	Manchurian tiger (<i>Felis tigris longipilis</i>)-----	4
Sun bear (<i>Helarctos malayanus</i>)-----	1	Leopard (<i>Felis pardus</i>)-----	1
Polar bear (<i>Thalarctos maritimus</i>)-----	2	Black leopard (<i>Felis pardus</i>)-----	1
Dingo (<i>Canis dingo</i>)-----	2	East African leopard (<i>Felis pardus suahelicus</i>)-----	4
Gray wolf (<i>Canis nubilus</i>)-----	6	Jaguar (<i>Felis onca</i>)-----	1
Florida wolf (<i>Canis floridanus</i>)-----	1	Serval (<i>Felis serval</i>)-----	1
Texas red wolf (<i>Canis rufus</i>)-----	1	East African serval (<i>Felis capensis hindei</i>)-----	1
Coyote (<i>Canis latrans</i>)-----	5	Ocelot (<i>Felis pardalis</i>)-----	2
Hybrid coyote (<i>Canis latrans-rufus</i>)--	4	Brazilian ocelot (<i>Felis pardalis brasiliensis</i>)-----	1
California coyote (<i>Canis ochropus</i>)--	1	Snow leopard (<i>Felis uncia</i>)-----	1
Black-backed jackal (<i>Canis mesomelas</i>)-----	1	Mexican puma (<i>Felis asteca</i>)-----	3
Rough fox (<i>Cerdocyon cancrivorus</i>)--	2	Mountain lion (<i>Felis hipposlestes</i>)--	1
Red fox (<i>Vulpes vulva</i>)-----	6	Yaguarundi (<i>Felis yagouaroundi</i>)-----	1
Silver-black fox (<i>Vulpes vulva</i>)-----	1	Indian caracal (<i>Lynx caracal</i>)-----	1
European fox (<i>Vulpes vulpes</i>)-----	1	Canada lynx (<i>Lynx canadensis</i>)-----	1
Kit fox (<i>Vulpes velox</i>)-----	2	Bay lynx (<i>Lynx rufus</i>)-----	3
Gray fox (<i>Urocyon cinereoargenteus</i>)--	1	Clouded leopard (<i>Neofelis nebulosa</i>)--	1
Bush dog (<i>Icticyon venaticus</i>)-----	1		
Cacomistle (<i>Bassariscus astutus</i>)-----	1	PINNIPEDIA	
Raccoon (<i>Procyon lotor</i>)-----	10	Leopard seal (<i>Phoca richardii</i> var.)--	3
Florida raccoon (<i>Procyon lotor elucis</i>)-----	1	San Geronimo harbor seal (<i>Phoca richardii geronimensis</i>)-----	1
Gray coatimundi (<i>Nasua narica</i>)-----	2		
Kinkajou (<i>Potos flavus</i>)-----	1		
Mexican kinkajou (<i>Potos flavus aztecus</i>)-----	1		
Fisher (<i>Martes pennanti</i>)-----	1		

RODENTIA

Woodchuck (<i>Marmota monax</i>)	8
Prairie dog (<i>Cynomys ludovicianus</i>)	9
Honduras squirrel (<i>Sciurus boothæ</i>)	1
Albino squirrel (<i>Sciurus carolinensis</i>)	2
Flying squirrel (<i>Sciuropterus volucella</i>)	3
American beaver (<i>Castor canadensis</i>)	4
African porcupine (<i>Hystrix africa- australis</i>)	1
East African porcupine (<i>Hystrix gale- ata</i>)	7
Malay porcupine (<i>Acanthion brach- yurum</i>)	2
East African gray mouse (<i>Graphiurus sp.</i>)	1
East African tree mouse (<i>Lemiscomys sp.</i>)	1
Viscacha (<i>Lagostomus trichodactylus</i>)	1
Central American paca (<i>Cuniculus paca virgatus</i>)	5
Sooty agouti (<i>Dasyprocta fuliginosa</i>)	1
Speckled agouti (<i>Dasyprocta punctata</i>)	2
Azara's agouti (<i>Dasyprocta azare</i>)	1
Trinidad agouti (<i>Dasyprocta rubrata</i>)	4
Guinea pig (<i>Cavia porcellus</i>)	10
Capybara (<i>Hydrochærus hydrochæris</i>)	1

LAGOMORPHA

Domestic rabbit (<i>Oryctolagus cunicu- lus</i>)	10
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PRIMATES

Zanzibar lemur (<i>Galago garnetti</i>)	1
Senaar lemur (<i>Galago senaariensis</i>)	1
Pangani lemur (<i>Galago pangani</i>)	1
Ring-tailed lemur (<i>Lemur catta</i>)	1
Red-fronted lemur (<i>Lemur rufifrons</i>)	1
Black lemur (<i>Lemur macaco</i>)	2
Gray spider monkey (<i>Ateles geoffroyi</i>)	2
Humboldt's woolly monkey (<i>Lagothrix humboldti</i>)	1
White-throated capuchin (<i>Cebus ca- pucinus</i>)	1
Brown capuchin (<i>Cebus fatuellus</i>)	2
Margarita capuchin (<i>Cebus marga- rite</i>)	1
Gelada baboon (<i>Theropithecus ob- scurus</i>)	1
Chacma (<i>Papio porcarius</i>)	1
Anubis baboon (<i>Papio cynocephalus</i>)	10
Olive baboon (<i>Papio neumanni</i>)	8
East African baboon (<i>Papio ibeanus</i>)	1
Mandrill (<i>Papio sphinx</i>)	3
Drill (<i>Papio leucophaeus</i>)	1
Moor macaque (<i>Gynopithecus maurus</i>)	4
Barbary ape (<i>Simia sylvanus</i>)	2
Japanese macaque (<i>Macaca fuscata</i>)	3
Pig-tailed monkey (<i>Macaca neme- strina</i>)	1
Burmese macaque (<i>Macaca andaman- ensis</i>)	1
Rhesus monkey (<i>Macaca rhesus</i>)	11
Crab-eating macaque (<i>Macaca irus</i>)	1
Philippine macaque (<i>Macaca syrichta</i>)	2
Javan macaque (<i>Macaca mordax</i>)	6

Sooty mangabey (<i>Cercocebus fuligi- nosus</i>)	4
Hagenbeck's mangabey (<i>Cercocebus hagenbecki</i>)	1
White-collared mangabey (<i>Cercocebus torquatus</i>)	1
Green guenon (<i>Lasiopyga callitrichus</i>)	2
Johnston's vervet (<i>Lasiopyga pygery- thra johnstoni</i>)	15
Sykes' guenon (<i>Lasiopyga albigula- ris</i>)	5
Mona guenon (<i>Lasiopyga mona</i>)	2
De Brazza's guenon (<i>Lasiopyga brazzae</i>)	1
Lesser white-nosed guenon (<i>Lasiopyga petaurista</i>)	1
Hanuman monkey (<i>Semnopithecus en- tellus</i>)	1
Gray gibbon (<i>Hylobates leuciscus</i>)	1
Chimpanzee (<i>Pan satyrus</i>)	2
Orang-utan (<i>Pongo pygmaeus</i>)	1

ARTIODACTYLA

Wart hog (<i>Phacochoerus æthiopicus</i>)	3
River hog (<i>Potamochoerus africanus</i>)	2
Collared peccary (<i>Pecari angulatus</i>)	2
Hippopotamus (<i>Hippopotamus amph- bius</i>)	2
Pigmy hippopotamus (<i>Chæropsis lib- eriensis</i>)	1
Bactrian camel (<i>Camelus bactrianus</i>)	1
Arabian camel (<i>Camelus dromedar- ius</i>)	1
Guanaco (<i>Lama huanachus</i>)	3
Llama (<i>Lama glama</i>)	5
Reindeer (<i>Rangifer tarandus</i>)	12
Fallow deer (<i>Dama dama</i>)	8
White fallow deer (<i>Dama dama</i>)	2
Axis deer (<i>Axis axis</i>)	4
Hog deer (<i>Hyelaphus porcinus</i>)	4
Sambar (<i>Rusa unicorn</i>)	1
Barasingha (<i>Rucervus duvaucelii</i>)	5
Burmese deer (<i>Rucervus eldii</i>)	1
Japanese deer (<i>Sika nippon</i>)	13
Red deer (<i>Cervus elaphus</i>)	12
Kashmir deer (<i>Cervus hanglu</i>)	2
Bedford deer (<i>Cervus xanthopygus</i>)	5
American elk (<i>Cervus canadensis</i>)	5
Guatemala deer (<i>Odocoileus sp.</i>)	1
Mule deer (<i>Odocoileus hemionus</i>)	3
Blesbok (<i>Damaliscus albifrons</i>)	1
White-tailed gnu (<i>Connochætes gnu</i>)	1
Brindled gnu (<i>Connochætes taurinus</i>)	1
White-bearded gnu (<i>Connochætes tauri- nus albojubatus</i>)	2
Lechwe (<i>Onotragus lechwe</i>)	1
Sable antelope (<i>Egocerus niger</i>)	1
Reed buck (<i>Redunca bohor</i>)	1
East African impalla (<i>Æpycceros me- lampus suara</i>)	2
Indian antelope (<i>Antilope cervicapra</i>)	3
Nilgai (<i>Boselaphus tragocamelus</i>)	2
East African eland (<i>Taurotragus oryx livingstonii</i>)	1
Mountain goat (<i>Oreamnos americanus</i>)	3
Tahr (<i>Hemitragus jemlahicus</i>)	9
Alpine ibex (<i>Capra ibex</i>)	3

Aoudad (<i>Ammotragus lervia</i>)-----	3	Baird's tapir (<i>Tapirella bairdii</i>)-----	1
Rocky Mountain sheep (<i>Ovis canadensis</i>)-----	8	Mongolian horse (<i>Equus przewalskii</i>)-----	1
Mouflon (<i>Ovis europæus</i>)-----	7	Mountain zebra (<i>Equus zebra</i>)-----	1
Greenland musk-ox (<i>Ovibos moschatus wardi</i>)-----	2	Chapman's zebra (<i>Equus quagga chapmani</i>)-----	2
Zebu (<i>Bos indicus</i>)-----	1	Zebra-horse hybrid (<i>Equus grevyi-caballus</i>)-----	1
Yak (<i>Poëphagus grunniens</i>)-----	6	Zebra-ass hybrid (<i>Equus grevyi-asinus</i>)-----	1
American bison (<i>Bison bison</i>)-----	17		
Anoa (<i>Anoa depressicornis</i>)-----	1		
Indian buffalo (<i>Bubalus bubalis</i>)-----	2		

PERISSODACTYLA

Malay tapir (<i>Tapirus indicus</i>)-----	1
Brazilian tapir (<i>Tapirus terrestris</i>)-----	1

PROBOSCIDEA

Abyssinian elephant (<i>Loxodonta africana oxyotis</i>)-----	1
Sumatran elephant (<i>Elephas sumatranus</i>)-----	1

BIRDS

STRUTHIONIFORMES

South African ostrich (<i>Struthio australis</i>)-----	3
Somaliland ostrich (<i>Struthio molybdophanes</i>)-----	1
Nubian ostrich (<i>Struthio camelus</i>)-----	1

RHEIFORMES

Rhea (<i>Rhea americana</i>)-----	2
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CASUARIIFORMES

Australian cassowary (<i>Casuarus australis</i>)-----	1
Single-wattled cassowary (<i>Casuarus uniappendiculatus</i>)-----	1
Sclater's cassowary (<i>Casuarus philippi</i>)-----	1
Emu (<i>Dromiceius novæhollandiæ</i>)-----	2

SPHENISCIFORMES

Rock-hopper penguin (<i>Catarrhactes pachyrhynchus</i>)-----	1
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CICONIIFORMES

American white pelican (<i>Pelecanus erythrorhynchos</i>)-----	8
European white pelican (<i>Pelecanus onocrotalus</i>)-----	2
Roseate pelican (<i>Pelecanus roseus</i>)-----	2
Australia pelican (<i>Pelecanus conspicillatus</i>)-----	2
Brown pelican (<i>Pelecanus occidentalis</i>)-----	7
California brown pelican (<i>Pelecanus californicus</i>)-----	5
Florida cormorant (<i>Phalacrocorax auritus floridanus</i>)-----	2
Brandt's cormorant (<i>Phalacrocorax penicillatus</i>)-----	1
Great white heron (<i>Ardea occidentalis</i>)-----	1
Great blue heron (<i>Ardea herodias</i>)-----	1
Goliath heron (<i>Ardea goliath</i>)-----	1
East African heron (<i>Ardea melanocephala</i>)-----	1
American egret (<i>Casmerodius egretta</i>)-----	1

Black-crowned night heron (<i>Nycticorax nycticorax naevius</i>)-----	77
Boatbill (<i>Cochlearius cochlearius</i>)-----	2
White stork (<i>Ciconia ciconia</i>)-----	1
Black stork (<i>Ciconia nigra</i>)-----	1
Marabou stork (<i>Leptoptilus crumeniferus</i>)-----	2
Shoe-bill (<i>Balæniceps rex</i>)-----	1
Wood ibis (<i>Mycteria americana</i>)-----	2
Sacred ibis (<i>Threskiornis aethiopicus</i>)-----	3
Black-headed ibis (<i>Threskiornis melanocephalus</i>)-----	3
Australian ibis (<i>Threskiornis strictipennis</i>)-----	2
White ibis (<i>Guara alba</i>)-----	8
Scarlet ibis (<i>Guara rubra</i>)-----	3

ANSERIFORMES

Mallard (<i>Anas platyrhynchos</i>)-----	48
Black duck (<i>Anas rubripes</i>)-----	7
Australian black duck (<i>Anas superciliosa</i>)-----	1
African pintail (<i>Anas erythrorhyncha</i>)-----	2
Gadwall (<i>Chaulelasmus streperus</i>)-----	13
European widgeon (<i>Mareca penelope</i>)-----	3
Baldpate (<i>Mareca americana</i>)-----	7
Green-winged teal (<i>Nettion carolinense</i>)-----	3
European teal (<i>Nettion crecca</i>)-----	4
Baikal teal (<i>Nettion formosum</i>)-----	5
Blue-winged teal (<i>Querquedula discors</i>)-----	1
Garganey (<i>Querquedula querquedula</i>)-----	6
Shoveller (<i>Spatula clypeata</i>)-----	1
Pintail (<i>Dafla acuta</i>)-----	11
Bahaman pintail (<i>Dafla bahamensis</i>)-----	1
Wood duck (<i>Ata sponsa</i>)-----	8
Mandarin duck (<i>Dendronessa galericulata</i>)-----	9
Canvasback (<i>Marila valisineria</i>)-----	7
European pochard (<i>Marila ferina</i>)-----	3
Redhead (<i>Marila americana</i>)-----	11
Ring-necked duck (<i>Marila collaris</i>)-----	2
Tufted duck (<i>Marila fuligula</i>)-----	1
Lesser scaup duck (<i>Marila affinis</i>)-----	1
Greater scaup duck (<i>Marila marila</i>)-----	3
Rosy-billed pochard (<i>Metopiana peposaca</i>)-----	4

Hawaiian goose (<i>Nesochen sandvicensis</i>)	2
Snow goose (<i>Chen hyperboreus</i>)	1
Greater snow goose (<i>Chen hyperboreus nivalis</i>)	1
Blue goose (<i>Chen caerulescens</i>)	5
White-fronted goose (<i>Anser albifrons</i>)	4
American white-fronted goose (<i>Anser albifrons gambeli</i>)	1
Bean goose (<i>Anser fabalis</i>)	2
Pink-footed goose (<i>Anser brachyrhynchus</i>)	2
Chinese goose (<i>Cygnopsis cygnoides</i>)	3
Bar-headed goose (<i>Eulabeia indica</i>)	2
Canada goose (<i>Branta canadensis</i>)	9
Hutchins's goose (<i>Branta canadensis hutchinsii</i>)	3
White-cheeked goose (<i>Branta canadensis occidentalis</i>)	16
Cackling goose (<i>Branta canadensis minima</i>)	2
Brant (<i>Branta bernicla glaucogastra</i>)	12
Barnacle goose (<i>Branta leucopsis</i>)	4
Emperor goose (<i>Philaegta canagica</i>)	3
Muscovy duck (<i>Cairina moschata</i>)	3
Pied goose (<i>Anseranas semipalmata</i>)	1
Black-bellied tree duck (<i>Dendrocygna autumnalis</i>)	2
Eyton's tree duck (<i>Dendrocygna eytoni</i>)	4
Mute swan (<i>Cygnus gibbus</i>)	3
Whistling swan (<i>Cygnus columbianus</i>)	1
Black swan (<i>Chenopsis atrata</i>)	4

FALCONIFORMES

Condor (<i>Vultur gryphus</i>)	1
California condor (<i>Gymnogyps californianus</i>)	3
Turkey vulture (<i>Cathartes aura</i>)	5
Black vulture (<i>Coragyps urubu</i>)	1
King vulture (<i>Sarcoramphus papa</i>)	2
Secretary bird (<i>Sagittarius serpentarius</i>)	1
Griфон vulture (<i>Gyps fulvus</i>)	1
African black vulture (<i>Torgos tracheliotus</i>)	1
Cinereous vulture (<i>Egyptius monachus</i>)	2
White-headed vulture (<i>Trionocephus occipitalis</i>)	1
Caracara (<i>Polyborus cheriway</i>)	3
Black-shouldered kite (<i>Elanus caeruleus</i>)	1
African black kite (<i>Milvus migrans parasiticus</i>)	1
Wedge-tailed eagle (<i>Uroaëtus audax</i>)	2
Golden eagle (<i>Aquila chrysaëtos</i>)	5
Tawny eagle (<i>Aquila rapax</i>)	2
White-bellied sea eagle (<i>Cuncuma leucogaster</i>)	2
Bald eagle (<i>Haliaeetus leucocephalus leucocephalus</i>)	9
Alaskan bald eagle (<i>Haliaeetus leucocephalus alascanus</i>)	3
Red-tailed hawk (<i>Buteo borealis</i>)	9
East African chanting goshawk (<i>Melierax poliopterus</i>)	1
Pigmy falcon (<i>Poliobierax semitorquatus</i>)	1

Sparrow hawk (<i>Falco sparverius</i>)	3
South African lanner (<i>Falco biarmicus</i>)	1

GALLIFORMES

Panama curassow (<i>Crax panamensis</i>)	2
Razor-billed curassow (<i>Mitu mitu</i>)	4
Crested guan (<i>Penelope boliviana</i>)	1
Mexican guan (<i>Ortalis vetula</i>)	2
Vulturine guinea fowl (<i>Acryllium vulturinum</i>)	2
Grants' crested guinea fowl (<i>Guttera granti</i>)	1
Reichenow's helmeted guinea fowl (<i>Numida mitrata reichenowi</i>)	12
Peafowl (<i>Pavo cristatus</i>)	10
Albino peafowl (<i>Pavo cristatus</i>)	4
Silver pheasant (<i>Gennæus nycthemerus</i>)	1
Edwards' pheasant (<i>Gennæus edwardsi</i>)	1
Golden pheasant (<i>Chrysolophus pictus</i>)	5
Lady Amherst's pheasant (<i>Chrysolophus amherstiae</i>)	1
Ring-necked pheasant (<i>Phasianus torquatus</i>)	13
Red-legged partridge (<i>Alectoris græca</i>)	1
Migratory quail (<i>Coturnix coturnix</i>)	10
Valley quail (<i>Lophortyx californica vallicola</i>)	1
Scaied quail (<i>Callipepla squamata</i>)	5

GRUIFORMES

Florida gallinule (<i>Gallinula galeata</i>)	2
African moorhen (<i>Gallinula chloropus brachyptera</i>)	4
East Indian gallinule (<i>Porphyrio calvus</i>)	1
Pukeko (<i>Porphyrio stanleyi</i>)	1
Black-tailed moor hen (<i>Microtribonyx ventralis</i>)	2
American coot (<i>Fulica americana</i>)	1
African black crane (<i>Limnocrex flavirostra</i>)	1
Lesser rail (<i>Hypoteniidia philippensis</i>)	2
South Island weka rail (<i>Ocydromus australis</i>)	2
Short-winged weka (<i>Ocydromus brachypterus</i>)	2
Sandhill crane (<i>Megalornis mexicana</i>)	4
Little brown crane (<i>Megalornis canadensis</i>)	3
White-necked crane (<i>Megalornis leucauchen</i>)	1
Indian white crane (<i>Megalornis leucogeranus</i>)	1
Lilford's crane (<i>Megalornis lilfordi</i>)	1
Australian crane (<i>Mathewsena rubicunda</i>)	2
Demoiselle crane (<i>Anthropoides virgo</i>)	3
Crowned crane (<i>Balearica pavonina</i>)	1
East African crowned crane (<i>Balearica regulorum gibbericeps</i>)	5
Kagu (<i>Rhynchotus jubatus</i>)	2

CHARADRIIFORMES

Ruff (<i>Philomachus pugnax</i>)-----	3	Severe macaw (<i>Ara severa</i>)-----	1
Lapwing (<i>Vanellus vanellus</i>)-----	1	Blue-and-yellow macaw (<i>Ara ararauna</i>)-	7
Yellow-wattled lapwing (<i>Lobivanellus</i>		Red-and-blue-and-yellow macaw (<i>Ara</i>	
<i>indicus</i>)-----	1	<i>macao</i>)-----	4
South American stone-plover (<i>Ædicne-</i>		Gray-breasted paroquet (<i>Myopsitta</i>	
<i>mus bistratus vocifer</i>)-----	1	<i>monachus</i>)-----	2
Pacific gull (<i>Gabianus pacificus</i>)-----	1	Petz's paroquet (<i>Eupsittula canicu-</i>	
Great black-backed gull (<i>Larus mari-</i>		<i>laris</i>)-----	5
<i>nus</i>)-----	2	Golden-crowned paroquet (<i>Eupsittula</i>	
Western gull (<i>Larus occidentalis</i>)----	6	<i>aurca</i>)-----	3
Herring gull (<i>Larus argentatus</i>)-----	3	Weddell's paroquet (<i>Eupsittula wed-</i>	
Silver gull (<i>Larus novæhollandiæ</i>)----	23	<i>dellii</i>)-----	3
Laughing gull (<i>Larus atricilla</i>)-----	2	Blue-winged parrotlet (<i>Psittacula pas-</i>	
Inca tern (<i>Noddi inca</i>)-----	1	<i>serina</i>)-----	13
Victoria crowned pigeon (<i>Goura victo-</i>		Golden paroquet (<i>Brotogeris chryso-</i>	
<i>ria</i>)-----	1	<i>sema</i>)-----	1
Bronze-wing pigeon (<i>Phaps chalcop-</i>		Tovi paroquet (<i>Brotogeris jugularis</i>)--	
<i>tera</i>)-----	2	Yellow-naped parrot (<i>Amazona auro-</i>	
Bleeding-heart dove (<i>Gallicolumba lu-</i>		<i>palliata</i>)-----	2
<i>zonica</i>)-----	♀	Mealy parrot (<i>Amazona farinosa</i>)-----	1
Wood pigeon (<i>Columba palumbus</i>)-----	7	Orange-winged parrot (<i>Amazona ama-</i>	
White-crowned pigeon (<i>Columba leuco-</i>		<i>zonica</i>)-----	5
<i>cephala</i>)-----	1	Blue-fronted parrot (<i>Amazona æstiva</i>)--	
Triangular spotted pigeon (<i>Columba</i>		Red-crowned parrot ₆ (<i>Amazona viridi-</i>	
<i>guinea</i>)-----	4	<i>genalis</i>)-----	3
Mourning dove (<i>Zenaidura macroura</i>)--	1	Double - yellow - head parrot (<i>Amazona</i>	
Mexican dove (<i>Zenaidura graysoni</i>)----	1	<i>oratrix</i>)-----	11
White-fronted dove (<i>Leptotilia fulvi-</i>		Yellow-headed parrot (<i>Amazona ochro-</i>	
<i>ventris brachyptera</i>)-----	4	<i>cephala</i>)-----	7
Necklaced dove (<i>Spilopelia tigrina</i>)----	9	Festive parrot (<i>Amazona festiva</i>)-----	3
Emerald spotted dove (<i>Turtur chalcop-</i>		Lesser white-fronted parrot (<i>Amazona</i>	
<i>spilos</i>)-----	22	<i>albifrons nana</i>)-----	1
Ringed turtledove (<i>Streptopelia riso-</i>		Santo Domingo parrot (<i>Amazona ven-</i>	
<i>ria</i>)-----	5	<i>tralis</i>)-----	3
East African ring-necked dove (<i>Strept-</i>		Cuban parrot (<i>Amazona leucocephala</i>)--	
<i>topelia capicola tropica</i>)-----	35	Maximilian's parrot (<i>Pionus maxi-</i>	
Masai mourning dove (<i>Streptopelia de-</i>		<i>miliani</i>)-----	1
<i>cupiens perspicillata</i>)-----	12	Dusky parrot (<i>Pionus fuscus</i>)-----	1
Zebra dove (<i>Geopelia striata</i>)-----	3	Blue-headed parrot (<i>Pionus men-</i>	
Bar-shouldered dove (<i>Geopelia humer-</i>		<i>struus</i>)-----	1
<i>alis</i>)-----	1	Amazonian caique (<i>Pionites xantho-</i>	
Cape masked dove (<i>Æna capensis</i>)----	12	<i>meria</i>)-----	5
Inca dove (<i>Scardafella inca</i>)-----	1	Black-headed caique (<i>Pionites melano-</i>	
Cuban ground dove (<i>Chæmepelia pas-</i>		<i>cephala</i>)-----	2
<i>scrina aflavida</i>)-----	1	East African brown parrot (<i>Poicepha-</i>	
Green-winged dove (<i>Chalcophaps in-</i>		<i>lus meyeri matschiei</i>)-----	2
<i>dica</i>)-----	2	Lesser vasa parrot (<i>Coracopsis nigra</i>)--	
Pacific fruit pigeon (<i>Globicera paci-</i>		<i>fica</i>)-----	1
<i>fica</i>)-----	2	Greater vasa parrot (<i>Coracopsis vasa</i>)--	
Bronze fruit pigeon (<i>Muscadivores</i>		Red-faced love bird (<i>Agapornis pul-</i>	
<i>ænea</i>)-----	1	<i>laria</i>)-----	7
Malay spotted dove (<i>Spilopelia ti-</i>		Gray-headed love bird (<i>Agapornis ma-</i>	
<i>grina</i>)-----	1	<i>dagascariensis</i>)-----	8
		Yellow-collared love bird (<i>Agapornis</i>	
		<i>personata</i>)-----	5
		Fischer's love bird (<i>Agapornis fischeri</i>)--	
		<i>personata</i>)-----	5
		Blue-bonnet paroquet (<i>Psephotus hæ-</i>	
		<i>matorrhous</i>)-----	1
		Pennant's paroquet (<i>Platyercus ele-</i>	
		<i>gans</i>)-----	1
		Black-tailed paroquet (<i>Polytelis melano-</i>	
		<i>nura</i>)-----	1
		Red-shining paroquet (<i>Pyrrhulopsis</i>	
		<i>splendens</i>)-----	1
		King paroquet (<i>Aprosmictus cyanopy-</i>	
		<i>gius</i>)-----	1
		Crimson-winged paroquet (<i>Aprosmictus</i>	
		<i>erythropterus</i>)-----	1

PSITTACIFORMES

Kea (<i>Nestor notabilis</i>)-----	1
Roseate cockatoo (<i>Kakatoe roseica-</i>	
<i>pillula</i>)-----	13
Bare-eyed cockatoo (<i>Kakatoe gymno-</i>	
<i>ptis</i>)-----	1
Leadbeater's cockatoo (<i>Kakatoe lead-</i>	
<i>beateri</i>)-----	3
White cockatoo (<i>Kakatoe alba</i>)-----	1
Sulphur-crested cockatoo (<i>Kakatoe ga-</i>	
<i>lerita</i>)-----	6
Mexican green macaw (<i>Ara mexicana</i>)--	2

Ring-necked paroquet (<i>Conurus torquatus</i>)	1
Nepalese paroquet (<i>Conurus nepalensis</i>)	2
Grass paroquet (<i>Melopsittacus undulatus</i>)	19

CORACIIFORMES

Jackson's hornbill (<i>Lophoceros jacksoni</i>)	2
Groove-billed toucanet (<i>Aulacorhampus sulcatus</i>)	1
Emin Pasha's barbet (<i>Trachyphonus emini</i>)	1
Morepork owl (<i>Spiloglaux novaezeelandiae</i>)	1
Barred owl (<i>Strix varia</i>)	11
Florida barred owl (<i>Strix varia alleni</i>)	1
Snowy owl (<i>Nyctea nyctea</i>)	3
Screech owl (<i>Otus asio</i>)	3
East African white-eared owl (<i>Otus leucotis granti</i>)	2
Great horned owl (<i>Bubo virginianus</i>)	13
Eagle owl (<i>Bubo bubo</i>)	1
Spotted eagle owl (<i>Bubo africanus</i>)	1
American barn owl (<i>Tyto alba pratincola</i>)	7
African barn owl (<i>Tyto alba affinis</i>)	8
Red-shafted flicker (<i>Colaptes cafer colaris</i>)	3

PASSERIFORMES

Cock of the rock (<i>Rupicola rupicola</i>)	1
Naked-throated bell-bird (<i>Chasmorhynchus nudicollis</i>)	1
Mockingbird (<i>Mimus polyglottos</i>)	1
Silver-eared hill-tit (<i>Mesia argenteauris</i>)	2
Red-billed hill-tit (<i>Liothrix luteus</i>)	19
Black-gorgeted laughing thrush (<i>Garulax pectoralis</i>)	2
White-eared bulbul (<i>Otocompsa leucotis</i>)	3
Red-eared bulbul (<i>Otocompsa jocosa</i>)	2
Black-headed bulbul (<i>Molpastes hamorrhous</i>)	3
Piping crow-shrike (<i>Gymnorhina tibicen</i>)	2
White-necked raven (<i>Corvultur albicollis</i>)	1
European raven (<i>Corvus corax</i>)	1
American raven (<i>Corvus corax sinuatus</i>)	5
Australian crow (<i>Corvus coronoides</i>)	1
American crow (<i>Corvus brachyrhynchus</i>)	1
White-breasted crow (<i>Corvus albus</i>)	5
American magpie (<i>Pica pica hudsonia</i>)	3
Yucatan jay (<i>Oissilopha yucatanica</i>)	1
Blue jay (<i>Cyanocitta cristata</i>)	2
Green jay (<i>Xanthoura luteosa</i>)	3
Blue honey-creeper (<i>Cyanerpes cyaneus</i>)	1
Blue-winged tanager (<i>Tanagra cyanoptera</i>)	1

Blue tanager (<i>Thraupis cana</i>)	1
Giant whydah (<i>Diatropura prognæ</i>)	1
Paradise whydah (<i>Steganura paradisæa</i>)	2
Shaft-tailed whydah (<i>Tetrænura regia</i>)	1
Red-crowned bishop bird (<i>Pyromelana sylvatica</i>)	12
Red-billed weaver (<i>Quelea quelea</i>)	1
Buffalo weaver (<i>Taxtor albirostris</i>)	2
Black-winged coral-billed weaver (<i>Taxtor niger nyassæ</i>)	25
Madagascar weaver (<i>Foudia madagascariensis</i>)	6
Black-headed weaver (<i>Hyphanturgus nigriceps</i>)	30
Emin's scaly-headed finch (<i>Sporopipes frontalis emini</i>)	25
St. Helena waxbill (<i>Estrilda astrilda</i>)	4
Orange-cheeked waxbill (<i>Estrilda melopoda</i>)	1
Rosy-rumped waxbill (<i>Estrilda rhodopygia</i>)	1
Blue-headed blue waxbill (<i>Uræginthus bengalus cyanocephalus</i>)	5
East African fire-throated finch (<i>Pytilia kirki</i>)	10
Nutmeg finch (<i>Munia punctulata</i>)	103
White-headed nun (<i>Munia maja</i>)	1
Black-headed nun (<i>Munia atricapilla</i>)	16
Chestnut-breasted finch (<i>Munia castaneithorax</i>)	2
Java finch (<i>Munia oryzivora</i>)	27
Masked grassfinch (<i>Poëphila personata</i>)	5
Diamond finch (<i>Steganopleura guttata</i>)	5
Zebra finch (<i>Trotopygia castanotis</i>)	15
Cutthroat finch (<i>Amadina fasciata</i>)	14
Tanganyika cutthroat finch (<i>Amadina fasciata alexanderi</i>)	12
Red-headed finch (<i>Amadina erythrocephala</i>)	2
Yellow-headed marshbird (<i>Agelaius icterocephalus</i>)	2
Australian gray jumper (<i>Struthidea cinerea</i>)	1
Starling (<i>Sturnus vulgaris</i>)	9
Shining starling (<i>Lamprocorax metallicus</i>)	3
Southern glossy starling (<i>Lamprocolius pestis</i>)	8
Crested mynah (<i>Æthiopsar cristatellus</i>)	1
Malay grackle (<i>Gracula javana</i>)	1
Bare-jawed troupial (<i>Gymnomystax melanicterus</i>)	1
Hooded oriole (<i>Icterus cucullatus</i>)	1
Yellow-tailed oriole (<i>Icterus mesomelas</i>)	1
Purple grackle (<i>Quiscalus quiscula</i>)	1
Greenfinch (<i>Chloris chloris</i>)	3
European goldfinch (<i>Carduelis carduelis</i>)	4
Brambling (<i>Fringilla montifringilla</i>)	4
Yellowhammer (<i>Emberiza citrinella</i>)	1
House finch (<i>Carpodacus mexicanus frontalis</i>)	2

San Lucas house finch (<i>Carpodacus mexicanus ruberrimus</i>)	2	San Diego song sparrow (<i>Melospiza melodia cooperi</i>)	2
Canary (<i>Serinus canarius</i>)	12	Coastal pale-bellied sparrow (<i>Passer griseus suahelicus</i>)	20
Little yellow serin (<i>Serinus icterus</i>)	15	Saffron finch (<i>Sticlis flaveola</i>)	9
Gray singing finch (<i>Serinus leucopygius</i>)	9	Blue grosbeak (<i>Guiraca cerulea</i>)	2
White-throated sparrow (<i>Zonotrichia albicollis</i>)	1	Red-crested cardinal (<i>Paroaria cucullata</i>)	8

REPTILES

Alligator (<i>Alligator mississippiensis</i>)	29	Spotted terrapin (<i>Clemmys guttata</i>)	3
Horned toad (<i>Phrynosoma cornutum</i>)	5	Soft-shelled terrapin (<i>Amyda spinifera</i>)	2
Blainville's horned toad (<i>Phrynosoma blainvillii</i>)	4	Musk turtle (<i>Sternotherus odoratus</i>)	1
Gila monster (<i>Heloderma suspectum</i>)	5	Mexican musk turtle (<i>Kinosternon sonoriense</i>)	1
Beaded lizard (<i>Heloderma horridum</i>)	1	South American musk turtle (<i>Kinosternon scorpioides</i>)	5
Gould's monitor (<i>Varanus gouldii</i>)	1	Pennsylvania musk turtle (<i>Kinosternon subrubrum</i>)	2
Egyptian monitor (<i>Varanus niloticus</i>)	1	Wood turtle (<i>Clemmys insculpta</i>)	2
Philippine monitor (<i>Varanus salvator</i>)	1	Leprous terrapin (<i>Clemmys leprosa</i>)	1
West Indian iguana (<i>Cyclura cornuta</i>)	1	Muhlenberg's terrapin (<i>Clemmys muhlenbergi</i>)	2
Rock python (<i>Python molurus</i>)	1	Blanding's terrapin (<i>Emys blandingii</i>)	2
Regal python (<i>Python reticulatus</i>)	1	European pond turtle (<i>Emys orbicularis</i>)	1
African python (<i>Python sebae</i>)	10	South American terrapin (<i>Nicoria punctularia</i>)	1
Anaconda (<i>Eunectes murinus</i>)	2	South African turtle (<i>Homopus areolatus</i>)	1
Boa constrictor (<i>Constrictor constrictor</i>)	3	Reeves turtle (<i>Geoclemys reevesi</i>)	1
California boa (<i>Lichanura roseofusca</i>)	1	Loochoo turtle (<i>Geoemyda spengleri</i>)	1
Porto Rican tree-boa (<i>Epicrates angulifer</i>)	10	Ceylon terrapin (<i>Geoemyda theralis</i>)	10
Brazilian tree-boa (<i>Epicrates crassus</i>)	1	Painted turtle (<i>Chrysemys picta</i>)	2
Black snake (<i>Coluber constrictor</i>)	1	Western painted turtle (<i>Chrysemys belli</i>)	1
Corn snake (<i>Elaphe guttata</i>)	1	Central American cooter (<i>Pseudemys ornata</i>)	2
Pine snake (<i>Pituophis melanoleucus</i>)	2	Gopher tortoise (<i>Gopherus polyphemus</i>)	1
King snake (<i>Lampropeltis getulus</i>)	1	Duncan Island tortoise (<i>Testudo ephippium</i>)	3
Water snake (<i>Natrix sipedon</i>)	2	Indefatigable Island tortoise (<i>Testudo porteri</i>)	1
Haitian snake (<i>Ialtris dorsalis</i>)	1	Albemarle Island tortoise (<i>Testudo vicina</i>)	2
Egyptian cobra (<i>Naja haje</i>)	3	South American tortoise (<i>Testudo denticulata</i>)	1
Black-necked spitting cobra (<i>Naja nigricollis</i>)	2	Hermann's tortoise (<i>Testudo hermanni</i>)	1
Boomslang (<i>Dispholidus typus</i>)	5	Angulated tortoise (<i>Testudo angulata</i>)	1
Copperhead (<i>Agkistrodon mokasen</i>)	3	Bell's tortoise (<i>Testudo belli</i>)	6
Fer-de-lance (<i>Bothrops lanceolatus</i>)	1	Leopard tortoise (<i>Testudo pardalis</i>)	12
Florida rattlesnake (<i>Crotalus adamanteus</i>)	2	Agassiz's tortoise (<i>Testudo agassizii</i>)	1
Western diamond rattlesnake (<i>Crotalus atrox</i>)	1	Berlandier's tortoise (<i>Testudo berlandieri</i>)	1
Banded rattlesnake (<i>Crotalus horridus</i>)	4	Iberian tortoise (<i>Testudo iberia</i>)	1
Snapping turtle (<i>Chelydra serpentina</i>)	2	Soft-shelled tortoise (<i>Testudo love-ridgi</i>)	30
Florida snapping turtle (<i>Chelydra osceola</i>)	1	Chicken turtle (<i>Deirochelys reticularia</i>)	1
Matamata (<i>Chelys fimbriata</i>)	1		
African mud terrapin (<i>Pelusius nigricans</i>)	26		
African snake-necked terrapin (<i>Pelomedusa galeata</i>)	40		
Brazilian snake-necked terrapin (<i>Hydraspis hilarii</i>)	1		
Diamond-back terrapin (<i>Malaclemys centrata</i>)	4		
Geographic terrapin (<i>Graptemys geographica</i>)	1		

BATRACHIANS

African smooth-clawed frog (<i>Xenopus mulleri</i>)	30	Giant salamander (<i>Megalobatrachus japonicus</i>)	2
Fire salamander (<i>Salamandra maculosa</i>)	1	Congo snake (<i>Amphytuma means</i>)	1

Statement of the collection

	Mam- mals	Birds	Reptiles and batra- chians	Total
Presented and collected by expedition.....				1,353
Born.....	41	33	30	104
Received in exchange.....	2	25	2	29
Purchased.....	30	14	2	46
Transferred from other Government departments.....	1	2		3
Total.....	74	74	34	1,535

SUMMARY

Animals on hand July 1, 1926.....	1,619
Accessions during the year.....	1,535
Total animals handled.....	3,154
Deduct loss (by death, return of animals, and exchange).....	788
	2,366

Status of collection

	Species	Individ- uals
Mammals.....	195	532
Birds.....	321	1,515
Reptiles and batrachians.....	76	319
	592	2,366

Although the list of animals has been augmented considerably, there are still numerous gaps in large and important forms. Many of the larger animals now in the collection are very old and will undoubtedly have to be replaced in the near future.

VISITORS

The attendance as recorded on the daily reports of the park was very much larger than any other year in the history of the Zoo. Attendance by months was as follows:

	1926		1927
July.....	247,500	January.....	74,650
August.....	315,100	February.....	73,800
September.....	321,550	March.....	188,850
October.....	172,000	April.....	326,580
November.....	440,800	May.....	371,400
December.....	75,300	June.....	259,700
		Total for year.....	2,867,230

The great crowds of visitors in November were attracted by the new animals brought from Africa.

Schools, classes, and similar organizations that visited the park numbered 370. Among them was the 4-H Club of the Department of Agriculture. The total number of persons in organized classes was about 25,000.

IMPROVEMENTS

A new flight cage, 30 by 60 feet and 35 feet high, containing two small pools, was installed in the ravine below the large flight cage. This houses gulls, terns, ibises, and other water birds and gives them opportunity to nest and raise their young unmolested by the pelicans and other large birds with which they formerly were continually in conflict. The large accession from the Smithsonian-Chrysler expedition necessitated alterations in the lion house, bird house, and monkey house to accommodate them. Practically all the cages in the monkey house were divided each into two. The bird house was remodeled to secure quarters for the giraffe.

A large amount of repair work and painting was done on the larger metal structures. The frame work of the great flight cage, exterior cages of the lion house and antelope house, and fences of the bear yard were painted, as well as much miscellaneous painting done throughout the park.

The electric pump that was purchased from the 1926 appropriation was installed at the central boiler house and a new and larger pipe connection made from the pump to the hippo, tapir, and alligator pools, greatly improving the supply of warmed water.

The electric service line was extended to the restaurant and electric refrigeration installed—the latter without expense to the park.

A new public walk was built from the junction of the roads to the lion house.

Preliminary to the building of the new bird house, an area about 250 feet square was cleared. In clearing the required space it was necessary to remove a number of large trees—mostly poplars. These were cut into saw-log lengths and converted into lumber.

A service road about 600 feet long was built to the site of the bird house from the new highway on the west side of the park. This road is of tar-bound macadam. It was found necessary to put in an unusually deep stone base for this road because of soft ground, and in view of the fact that heavy hauling would be done over it in bringing materials for the building, and later, bringing coal and other supplies. The sewer and water systems of the park were extended to the site.

A passenger automobile was purchased second hand, and a 1-ton truck was bought for light work about the grounds. A G. M. C. 1½-ton "light aviation" truck chassis was received by transfer.

This was equipped in the park shop with a dumping body, tires, and other necessary fittings and is very useful for heavy hauling.

Food cost somewhat more than during the previous year, owing mainly to increase in price of horse meat. This increase seems likely to be permanent.

NEW BIRD HOUSE

The firm of Arthur L. Smith was awarded the contract for the new bird house by the District architect, and construction was begun on the building in the late spring. The work of grading and laying foundations progressed satisfactorily. Brick work is being executed and the prospects are that the house will be ready for the installation of the bird collection in early spring.

Since many years ago when the Zoological Park received an appropriation of \$10,000 to build an elephant house, swimming pool and a yard, the park has never until the past year received an appropriation to construct an exhibition building for animals. This bird house, which has been sadly needed for many years, will be an impressive improvement to the park. The birds will live under modern hygienic conditions and will make an exceedingly fine exhibit.

NEEDS OF THE ZOO

To a large extent, the animals have still to be kept in temporary quarters which are insufficient and unsuitable, and are costly to maintain because of the repairs which are constantly required.

This statement, which was made in the report for 1910 and repeated from year to year in annual reports, applies even more to-day. While our collection is one of the finest in America, though being rapidly surpassed by six other zoos, the park itself is probably the finest naturally of any zoo in the world; the climate is particularly healthy for animals, which has been proved by numerous records for longevity made in the park, but our buildings are entirely unsuitable and a source of continual unfavorable comment on the part of visitors.

We have a definite building program for structures necessary for the proper housing and exhibition of our stock. These are a reptile and batrachian house, a small mammal house, and a pachyderm house. The construction of these three buildings would enable us to reorganize such as we have now and to tear down other structures constructed originally as temporary makeshifts and which are absolutely unsuitable for the purposes for which they are now used. This year we requested in our annual estimates funds for the construction of a reptile house.

Reptile house.—Ever since 1910 appeals have been made for an exhibition house to contain reptiles, batrachians, and insects. In

addition to having probably more educational value than any other exhibition, such a house has always been most popular with the public in zoos where they exist; so popular, in fact, that in certain zoological parks where admission is required, an extra admission is charged for entry into the reptile building. Here in Washington, visitors repeatedly ask the location of such a building.

Despite the fact that the park management makes no particular attempt to get reptiles, our collection at present consists of nearly 400 specimens representing many rare and valuable species. Among them is a notable collection of the now almost extinct Galapagos Island tortoise, represented here by six specimens belonging to three species. During the winter these are kept in a gloomy room not on exhibition and in a situation crowded and otherwise unsuited to their well-being. The majority of other reptiles in the park are kept in the same building in small boxes.

A request has been made in the estimates for appropriations for such a building in which are to be exhibited not only reptiles and batrachians but also insects and a collection of small tropical fishes.

CONCESSIONS

Practically all zoological gardens maintain refreshment stands and restaurants, and the profits from these are used to purchase animals for the collection. The control by the National Zoological Park of a limited number of concessions would be a distinct benefit to the public in two ways—the service would be enlarged and greatly improved, and the entire profit from the concessions would be used to purchase additional specimens for the exhibition collection.

Respectfully submitted.

W. M. MANN, *Director.*

Dr. C. G. ABBOT,
Acting Secretary, Smithsonian Institution.

APPENDIX 7

REPORT ON THE ASTROPHYSICAL OBSERVATORY

SIR: The Astrophysical Observatory was conducted under the following passage of the independent offices appropriation act approved April 22, 1926:

Astrophysical Observatory: For maintenance of the Astrophysical Observatory, under the direction of the Smithsonian Institution, including assistants, purchase of books, periodicals, and apparatus, making necessary observations in high altitudes, repairs and alterations of buildings, preparation of manuscripts, drawings, and illustrations, traveling expenses, and miscellaneous expenses, \$31,180, of which amount not to exceed \$27,840 may be expended for personal services in the District of Columbia.

The observatory occupies a number of frame structures within an inclosure of about 16,000 square feet south of the Smithsonian administration building at Washington, a cement observing station and frame structure for observers on a plot of 10,000 square feet leased from the Mount Wilson Observatory, and an observing station on Table Mountain, Calif. This last station, provided by Mr. John A. Roebling, includes a tunnel for instruments, small structures for the field director and for the assistant, a shop, and a garage.

The Astrophysical Observatory also defrays a part of the cost of the maintenance of the observing station at Montezuma, Chile, which was erected in 1920, with means furnished by Mr. Roebling. The constructions there comprise a tunnel for instruments, a small structure for observers, shop, garage, and a telephone line 12 miles to Calama.

The present value of the buildings and equipment for the Astrophysical observatory owned by the Government is estimated at \$50,000. This estimate contemplates the cost required to replace the outfit for the purposes of the investigations.

WORK AT WASHINGTON

(a) *Radiometer*.—With the cooperation of the Bureau of Standards, whose glass blower, Mr. Sperling, made the difficult glass work needed with glass-sealed optical windows, preparations were made to construct a very sensitive radiometer. It will be recalled that in October, 1923, Dr. C. G. Abbot employed a radiometer prepared by Nichols and Tear, and, observing with the 100-inch telescope on Mount Wilson, obtained the first energy-spectra of stars ever measured with heat-recording apparatus. In 1924 he

attempted to improve on these first results by constructing a lighter system, using flies' wings to prepare the vanes of the instrument. But he found that at the air pressure required to give a good radiometer deflection, the system was damped into such sluggishness as to be useless. At the suggestion of Doctor Anderson of Mount Wilson Observatory, Doctor Abbot proposed to substitute hydrogen for air, hoping to get equal sensitiveness and much less damping. As hydrogen would be contaminated by air leakage, or cock grease, or mercury vapor if connected with an air pump, as usual, he proposed to seal up the suspended system in glass like an X-ray tube, having first exhausted the glass case as completely as possible, and filled in pure hydrogen (through a liquid air trap) to the desired pressure.

The necessity of rotating the suspended system with reference to the glass case and its optical windows offered difficulties. However, this was accomplished by including within the case a train of gearing ending in a little horseshoe magnet, which could be rotated by another magnet from without. The reduction of speed from the magnet to the suspension system was in all nearly 10,000-fold, so that a little reversible electric motor, with cone drive, was arranged to drive the outside magnet through so many thousands of turns. All of these contrivances were constructed by Mr. Kramer under Doctor Abbot's direction, but the actual expedition to Mount Wilson did not go forward until July, 1927, and will be described in the report of 1928. It may be worth while to add, however, that Mr. Aldrich tested occasionally for 10 months, by weighings, the evaporation of a large surface of beeswax laid down on thin mica. The loss was so very slight that this substance was found quite suitable to fasten the parts of the radiometer suspension without fear of appreciably contaminating the hydrogen by mixture of its heavy molecules.

(b) *Pyrheliometer*.—Although the Californian and the South West African equipments had been supplied with silver-disk pyrheliometers with very long vestibules to cut down the effect of atmospheric radiation immediately surrounding the sun, and though all of our observatories have been equipped with half-second pendulums to reduce error in time observations at the pyrheliometers, yet we are seeking a degree of accuracy so high that an attempt seemed desirable to devise a new type of pyrheliometer in which errors would be still more reduced. This instrument was not entirely completed at the close of the period of this report, and its performance will be described in the report for 1928.

(c) *Revision of observations*.—The important work of revision of solar radiation measurements mentioned in last year's report was prosecuted vigorously during the fiscal year. A complete re-reduc-

tion of all Montezuma observations from 1923 to date, including the measurement of plates for nearly 150 days of fundamental observation by Langley's method, and also the setting up of a new system of reduction for short-method observations, was completed in May, 1927. The new results, while differing on the average by only a small fraction of 1 per cent from the preliminary ones, are undoubtedly of much greater weight, and may now be regarded as definitive. A full description of the processes and the reasons for them will eventually be published.

A similar study of all Table Mountain observations is going on, and, when completed, definitive observations will be published from that station also.

Readers may understand the necessity of these revisions of solar radiation observations by recalling that in astronomy the late Prof. Lewis Boss spent many years in a revision of all high-class observations of the positions of stars, and introduced numerous corrections to the individual observations, based on extensive statistical study, before he was able to combine the whole study into his "Classical Preliminary General Catalogue." A similar statistical study of our solar observations could not be made until several years of homogeneous measurements were available. It would have been better to have waited for 10 years before making it, but the urgent demands of meteorologists for our solar observations have induced us to try to put the matter in definitive form thus early.

(d) *Smithsonian exhibition of February 11, 1927.*—In connection with the conference of eminent men on the future of the Smithsonian Institution, the Astrophysical Observatory, as well as other departments, was represented by an exhibit of working instruments, diagrams, and photographs. In order to give as complete and striking a picture as possible of the purposes and attainments of the observatory a very considerable amount of time of the director, of Mr. Aldrich, and of Mr. Kramer, was devoted thereto.

FIELD WORK

(a) *Table Mountain, Calif.*—This observatory, which by Mr. John A. Roebling's generosity was erected in the autumn of 1925 to replace that on Mount Harqua Hala, has been in continuous observation of the solar constant of radiation during the fiscal year. While the number of days available for observation does not very greatly exceed the number at Harqua Hala, the quality of these days, especially in the months of June, July, August, and September, is immensely superior. On one occasion in the autumn of 1926 Mr. Moore was able to observe at Table Mountain on 71 consecutive days, which is by far the maximum record for any of our stations.

As stated above, a definitive reduction of all Table Mountain observations is being vigorously pushed.

(b) *Montezuma, Chile*.—This, our best solar constant station, was also in continuous observation during the entire year. Its daily results were published on the United States weather maps of the next following days; also, telegraphic advices were sent daily to the Argentine Government, and to Dr. Julio Bustos Navarette, who publishes a monthly meteorological bulletin containing them.

As stated above, a definite re-reduction of the Montezuma work has been completed, and the results are now being published in final form.

At the suggestion of Doctor Dobson, of Oxford, England, a copy of his atmospheric ozone measuring apparatus has been installed at Montezuma, and its daily results are forwarded to Doctor Dobson for reduction and publication.

(c) *Mount Brukkaros, South West Africa*.—The solar radiation expedition of the National Geographic Society, in cooperation with the Smithsonian Institution, was fully equipped and sent forward in August, 1926. Meanwhile, the observatory itself was being prepared by Mr. Dryden, of Keetmanshoop, South West Africa, under Government auspices. A little later a telephone line was installed by Colonel Venning, director of posts and telegraph, of Windhoek.

The expedition (W. H. Hoover, director, F. W. Greeley, assistant) reached the mountain in October, 1926, made preliminary observations in November, and began regular daily observing in December.

It is yet too early to decide how satisfactory atmospheric conditions at this observatory will prove to be. During a considerable part of the time they have been first class. Old residents maintain that during the unfavorable time the weather has been unusual, and that other years will prove much better. This view is supported to some extent by the weather of Montezuma, Chile, which seems to be in some degree parallel. Atmospheric conditions have undoubtedly been unusually bad at Montezuma during the times when Mount Brukkaros reported unfavorable conditions.

Personnel.—The present personnel of the Astrophysical Observatory is as follows:

Director,¹ Dr. C. G. ABBOT, Washington.

Field director, Mr. A. F. MOORE, Table Mountain.

Field director, Mr. H. B. FREEMAN, Montezuma.

Field director,² Mr. W. H. HOOVER, Mount Brukkaros.

Research assistant, Mr. F. E. FOWLE, Washington.

Research assistant, Mr. L. B. ALDRICH, Washington.

Field assistant,² Mr. H. H. ZODTNER, Table Mountain.

Field assistant,² Mr. E. E. WARNER, Montezuma.

¹ This compensation was defrayed in part from private funds.

² This compensation was defrayed in part or wholly from private funds.

Field assistant, Mr. F. A. GREELEY, Mount Brukkaros.

Computer, Mrs. A. M. BOND, Washington.

Computer, Miss M. A. MARSDEN, Washington.

Computer,² Miss M. C. RHODERICK, Washington (temporary).

Instrument maker, Mr. A. KRAMER, Washington.

Librarian,² Mrs. M. L. REED, Washington (temporary).

Librarian,² Mrs. A. E. BLANCHARD, Washington (temporary).

Librarian,² Miss M. B. LADD, Washington (temporary).

Librarian,² Miss C. S. GUNTHER, Washington (temporary).

Summary.—The work of the year was mainly in continuation of accurate observations of the solar constant of radiation. A new cooperating observatory in South West Africa was installed at the cost of the National Geographic Society. Improved apparatus and procedure has led to a higher standard of accuracy in all the observatories than ever before.

Gratifying correlations with other results are appearing. Thus Doctor Pettit's observations of ultra-violet solar radiation, while showing extreme variations of at least a hundred per cent, are closely in proportion with the small changes found in total solar radiation by the Smithsonian observers. Doctor Austin, too, finds a very high correlation between solar constant changes and the reception of long range radio.

Finally, a remarkable regular periodicity of $25\frac{2}{3}$ months has been found by Dr. C. G. Abbot in the solar variation itself, which, during the years 1920 to 1927, has joined with the sun-spot cycle to account for almost the whole change in monthly mean solar constant results. If this persists in future years, it may become possible to forecast at least two years in advance the principal solar changes, and whatever of importance may prove to hang thereon.

Respectfully submitted.

C. G. ABBOT,

Director Astrophysical Observatory.

To the ACTING SECRETARY,

SMITHSONIAN INSTITUTION.

²This compensation was defrayed in part or wholly from private funds.

APPENDIX 8

REPORT ON THE INTERNATIONAL CATALOGUE OF SCIENTIFIC LITERATURE

SIR: I have the honor to submit herewith the following report on the operations of the United States regional bureau of the International Catalogue of Scientific Literature for the fiscal year ending June 30, 1927:

Since 1921, when war conditions in the majority of the 33 countries cooperating in the enterprise made it impossible for them to provide their quota of the funds needed to continue publication, it has been the aim of this bureau to collect and record the data necessary to enable it to supply, when publication is resumed, an index to the scientific publications of the United States and its possessions, and this routine has been the principal part of its work during the year.

A partial list of the scientific journals of 25 of the countries cooperating in the catalogue was published in 1903 and a supplementary list in 1904, bringing the number of countries represented up to 27 and making a total of 5,496 titles, as shown in the following table.

List of journals

	1903	1904	Total		1903	1904	Total
Austria.....	0	536	536	New South Wales.....	7	1	8
Belgium.....	171	2	173	New Zealand.....	1	0	1
Canada.....	45	0	45	Norway.....	30	6	36
Colony of the Cape of Good Hope.....	5	0	5	Poland.....	65	0	65
Denmark.....	39	1	40	Portugal.....	19	0	19
Finland.....	31	2	33	Russia.....	409	47	456
France.....	900	11	911	South Africa.....	0	15	15
Germany.....	1,297	86	1,383	South Australia.....	6	0	6
Greece.....	11	0	11	Sweden.....	62	1	63
Holland.....	66	2	68	Switzerland.....	126	126	252
Hungary.....	21	14	35	United Kingdom.....	471	16	487
India and Ceylon.....	30	1	31	United States of America.....	408	51	459
Italy.....	252	41	293	Victoria (Australia).....	20	3	23
Japan.....	42	0	42	Total.....	4,534	962	5,496

The number 459 does not represent all the American journals actually indexed by this bureau. The purpose of the list being primarily to explain the abbreviations used in the catalogue, many State publications which were abbreviated in a uniform manner were

not listed separately, while unabbreviated titles were omitted altogether. Although no supplementary lists have been published since 1904, many journals have been added since that time. Pending the resumption of publication, it was felt that the United States list should be entirely revised, and the collection of necessary data for this work was begun during the year. When the list is completed, it is expected to publish it in pamphlet form, as no such list now exists, although a general need for it is felt among librarians and students of science quite independently of the requirements of the International Catalogue.

In 1922 the International Convention of the Catalogue at its meeting in Brussels passed a resolution to keep the organization in being until financial conditions should make it possible to resume publication. Since that time it has been the aim of this bureau to do its part in continuing the work of the catalogue. Each year, when Congress is asked for the appropriation for maintenance, the explanation is made that although nothing is now being published it is felt that, in view of the recognized need of such a catalogue, the United States should do its utmost to keep the present organization alive. This is the more important in order that the labors of so many eminent men, who in the beginning succeeded in the very difficult task of securing the cooperation of 33 countries, should not be lost, and also that as soon as a sufficient endowment is had, or international financial conditions become normal, the original organization can again take up the work at the point where war conditions made suspension necessary.

Very respectfully,

LEONARD GUNNELL,
Assistant in Charge.

DR. CHARLES G. ABBOT,
Acting Secretary, Smithsonian Institution.

APPENDIX 9

REPORT ON THE LIBRARY

SIR: I have the honor to submit the following report on the activities of the library of the Smithsonian Institution for the fiscal year ended June 30, 1927:

WHAT THE LIBRARY IS

Perhaps it will not be amiss if I explain at the outset what the Smithsonian library is. It is the library, now numbering about 700,000 volumes, pamphlets, and charts, to say nothing of many thousands of volumes awaiting completion, that has grown up since 1846 around the activities of the Institution. As these activities have been various, the library naturally falls into several divisions, but all with one central purpose—that of assisting the Institution in the increase and diffusion of knowledge.

Chief among these divisions are the Smithsonian deposit in the Library of Congress, which is the main library of the Institution, and the library of the United States National Museum, which consists largely of material having to do with the different branches of natural science represented in the Museum. The other divisions are the office library, the technological library, the Langley aeronautical library, and the libraries respectively of the Astrophysical Observatory, the Bureau of American Ethnology, the National Gallery of Art, the Freer Gallery of Art, and the National Zoological Park. Together these comprise the Smithsonian library. They are, of course, distinct working units, each serving its own end in its own place, but all contributing toward the realization of a common ideal.

For the sake of making the material in these 10 divisions more completely and centrally available, a union catalogue of their collections is being prepared, to be kept in the Smithsonian Building. This will be one of the main pieces of work of the library staff for years to come, and one of the most serviceable to the Institution.

CHANGES IN STAFF

Few changes occurred in the staff during the year. This was most gratifying, as permanence of tenure on the part of trained and willing employees makes for efficiency, especially in so highly technical an organization as a scientific library.

One of the two positions of minor library assistant granted by Congress as of July 1, 1926, was filled by the promotion of Miss Agnes Auth; the other was filled temporarily until toward the close of the year, when Mrs. Mary Arnold Baer, library aid, was recommended for it.

In the position of assistant messenger Mr. William Helvestine was succeeded by Mr. Robert Mooney, and he in turn by Mr. Herschel Chappell. Both Mr. Helvestine and Mr. Mooney resigned to accept higher positions elsewhere in the Institution.

In the course of the year the following persons were employed temporarily: Mrs. Madaline D. Amphlett, Mrs. Adella E. Blanchard, Mr. Clarence Gunther, Miss Elisabeth Hobbs, Mrs. Dorothy P. Hulsizer, Mr. Walter Jaeger, Miss Mary Ladd, Mrs. M. Landon Reed, Mr. Giles E. Taggart, Miss Helen Turnbull, and Mrs. Victoria B. Turner.

To expedite the carrying out of the plans of reorganization begun three years ago, there is urgent need of two more positions of the rank of assistant librarian—one for a head of the accessions department, the other for a head of the catalogue department. These, with the head of the reference department, already appointed, will direct, under the librarian, the three general activities of the library, namely, acquiring material, making it available, and using it. It is earnestly hoped that the two positions referred to can be created without delay.

EXCHANGE OF PUBLICATIONS

The growth of the library, although dependent somewhat upon purchase and gift, is dependent chiefly upon the exchange of publications between the Institution and its branches and other learned institutions and societies throughout the world. These publications come to the library direct, or through the international exchange service, which is administered by the Institution. During the last fiscal year 31,647 packages, of one or more publications each, came by mail, and 7,459 through the exchange. This was an increase of more than 1,200 packages over the year before, and testified to the generous response made to the letters prepared by the library asking for numbers missing from its sets, or proposing or accepting exchange relations with new societies. In all, 1,604 letters were written—a gain of nearly 400 over the previous year. Most of these had to do with the exchange of publications. After the 39,106 packages had been opened, the items were stamped, entered, and sent to the appropriate divisions of the library, but chiefly to the Smithsonian deposit in the Library of Congress and the library of the National Museum.

As usual, dissertations were received from various universities, such as Basel, Berlin, Bern, Bonn, Copenhagen, Delft, Frankfurt, Giessen,

Graz, Greifswald, Johns Hopkins, Leipzig, Warburg, Neuchâtel, Pennsylvania, Strasbourg, and Zürich; and from technical schools at Berlin, Charlottenburg, Delft, and Freiberg.

SMITHSONIAN DEPOSIT

As has been said, the main division of the library of the Institution is the Smithsonian deposit in the Library of Congress. This is, of course, distributed according to classification, but because of its prevalingly scientific nature it is chiefly in the Smithsonian division, which was established in 1900 to take care of it, in common with the scientific publications belonging to the Library of Congress.

This collection, which began with the deposit of 40,000 volumes by the Smithsonian Institution in 1866, under authorization of an act of Congress, has grown by almost daily additions from the Institution until it has come to hold a foremost place among libraries of its kind, being especially rich in the reports, proceedings, and transactions of learned institutions and societies the world over.

The publications sent to the deposit by the Institution during the last fiscal year numbered 5,790, of which 4,046 were complete volumes, 329 parts of volumes, 147 pamphlets, and 268 charts. These represented a gain over the year before of 702, more than one-half of which were complete volumes. Documents of foreign governments, chiefly statistical in character, to the number of about 7,500, were also sent, without being stamped or entered, to the document division of the Library of Congress. In response to special requests from the Smithsonian division, the periodical division, and the order division of the Library of Congress for publications needed to complete sets in the deposit, the Smithsonian library was able to obtain by exchange 495 volumes and 602 parts of volumes, including title-pages and indexes.

OFFICE LIBRARY

The office library is made up of the society publications that are kept in the Smithsonian Building, the art-room collection, the employees' library, and various books, mainly of a reference nature, assigned for special use to other divisions of the library or to the administrative offices of the Institution. To this library were added during the year 146 volumes, 3 parts of volumes, and 10 pamphlets. The circulation was 2,228, of which 1,941 were magazines. Many volumes were consulted in the reference room.

Among the noteworthy gifts to the library were the following: New Coptic Texts from the Monastery of St. Macarius, and the Monastery of Epiphanius at Thebes, from the Metropolitan Museum of Art; the Catalogue of the Philatelic Library of the Earl of Crawford, together with a supplement, compiled by E. D. Bacon and presented

by the Philatelic Literature Society of London; *Nomenclator Animalium Generum et Subgenerum*, from the Preussische Akademie der Wissenschaften—a publication not regularly sent in exchange, but which the Academy was good enough to present to the Smithsonian Institution; *Le Trésor de Pétroussa*, from the Academia Romana; and *Denkmaller aus Aegypten und Aethiopen*, in 12 volumes, by C. E. Lepsius, from Mrs. George Cabot Lodge. Another important gift was a copy of *Billeder af Nordens Flora Med Tekst af A. Mentz og C. H. Ostenfeld*—a work in which the authors are doing for Scandinavian wild flowers what Mrs. Charles D. Walcott, in her well-known *North American Wild Flowers*, is doing for the flowers of our own country. This interesting work was presented to the Institution by the authors, through the good offices of Dr. Oskar Thyregod, librarian of the Industriforeningens Bibliotek, Copenhagen.

But the outstanding gift of the year was that of the John Donnell Smith botanical collection of 1,600 volumes. This library was really presented to the Institution in 1905, but only part of it was transferred to Washington before last year. Now it is all shelved in the west end of the Smithsonian Building, awaiting the completion of a special alcove in the section of botany, where it will be deposited, that it may be easily available to the scientists there. This is one of the most valuable gifts ever made to the Smithsonian library. It includes books not duplicated in Washington, and at least one rare work of which, so far as the librarian knows, there is only one other copy in the United States. This is a volume by Gomez Ortega, published at Madrid in 1797, which contains the first published descriptions of many important plants of Mexico. The library is particularly rich in works on tropical American plants, especially those of Central America. Many of the books were obtained abroad and are beautifully bound. Each volume bears a distinctive plate with the name of the donor. In 1908 a catalogue of the collection was prepared by Miss Alice Cary Atwood, of the Department of Agriculture, and published by the Institution.

The work done on the general catalogue of the Smithsonian library (not including that in connection with the library of the Astrophysical Observatory, spoken of elsewhere), which is kept in the office reading room, was as follows:

Volumes catalogued.....	3,922
Volumes recatalogued.....	134
Charts catalogued.....	221
Cards typed.....	1,697
Library of Congress cards filed.....	406
New authors added.....	520

MUSEUM LIBRARY

During the year 2,492 volumes and 1,299 pamphlets were added to the library of the National Museum, representing an increase in accessions of more than 20 per cent over the year before, and giving the library a total of 69,300 volumes and 105,716 pamphlets. Most of the accessions came, of course, by exchange; others came by gift, especially from the Library of Congress, which was generous enough to send from its collection of duplicates 512 volumes and 1,926 parts of volumes needed by the library toward completing its sets. Important gifts were also made by the late Secretary Walcott, Dr. W. H. Holmes, and Dr. C. W. Richmond. Some of the other donors were Assistant Secretary Wetmore, Dr. J. M. Aldrich, Mr. A. H. Clark, the late Dr. W. H. Dall, Dr. O. P. Hay, Dr. Walter Hough, Dr. Aleš Hrdlička, Mr. N. M. Judd, Dr. W. R. Maxon, Dr. G. P. Merrill, Dr. G. S. Miller, Mr. A. J. Olmsted, Miss M. J. Rathbun, and Mr. J. H. Riley.

In the course of the year 12,274 parts of periodicals were entered, 710 volumes and 948 pamphlets were catalogued, and 4,818 cards were added to the shelf list. The loans to members of the scientific staff totaled 4,316, of which 1,721 were borrowed from the Library of Congress and 137 elsewhere. The other loans numbered 198, made chiefly to Government libraries and libraries outside of Washington. Thousands of publications were consulted in the reference room, both by members of the staff and by other research workers, including some from foreign countries.

The number of sectional libraries in the Museum is now 36. As has been indicated elsewhere in this report, progress was made during the year in supplying numbers missing from their sets, particularly of society publications, and in cataloguing several of their special collections. The sectional libraries are as follows:

Administration.	Insects.
Administrative assistant's office.	Invertebrate paleontology.
American archeology.	Mammals.
Anthropology.	Marine invertebrates.
Biology.	Mechanical technology.
Birds.	Medicine.
Botany.	Minerals.
Echinoderms.	Mineral technology.
Editor's office.	Mollusks.
Ethnology.	Old World archeology.
Fishes.	Organic chemistry.
Foods.	Paleobotany.
Geology.	Photography.
Graphic arts.	Physical anthropology.
History.	Property clerk's office.

Reptiles and batrachians.	Textiles.
Superintendent's office.	Vertebrate paleontology.
Taxidermy.	Wood technology.

TECHNOLOGICAL LIBRARY

The technological library, which is located in the old Museum Building, concerns itself chiefly with the useful arts and industries. During the year the work of reorganizing its material was considerably advanced. The shelf list was finished by the addition of 2,500 cards, and an excellent beginning made on the inventory. Many duplicates were removed to the west stacks of the Smithsonian Building, together with a large number of Government publications and publications of various States not needed in the library. These will be disposed of later. Their removal from the old Museum has materially increased the space available for collections necessary to the work of the curators. The loans numbered 450.

ASTROPHYSICAL OBSERVATORY LIBRARY

The library of the Astrophysical Observatory, which is housed partly in the Smithsonian Building and partly in the observatory at the rear of this building, consists of 3,637 volumes and about 2,700 pamphlets, chiefly on astrophysics and meteorology. It is one of the most important of the smaller divisions of the Smithsonian library, being of especial value in connection with the well-known researches in solar radiation that are being carried on by the Institution. This library received particular attention during the past year. A shelf list was prepared, an inventory taken, and its material completely rearranged. Many gaps in its sets were filled. A notable beginning was also made on a dictionary catalogue, with subject cards and analyticals, under the direction of a person of long experience in the Library of Congress. A detailed record of this work follows:

Volumes catalogued.....	548
Pamphlets catalogued.....	1,032
Charts catalogued.....	14
Library of Congress cards filed.....	6,918
Cards typed.....	2,298

The library was increased by 137 volumes, 16 parts of volumes, and 22 pamphlets. The number of volumes bound was 49. The loans are included among those of the office library.

BUREAU OF AMERICAN ETHNOLOGY LIBRARY

The library of the Bureau of American Ethnology, which is in the Smithsonian Building, consists almost exclusively of works on anthropology, particularly those pertaining to the American

aborigines, and covers especially the linguistics, history, archeology, myths, religion, arts, sociology, and general culture of the American Indian. It contains 27,141 volumes and 15,937 pamphlets. In its special data files are manuscript material, photographs, Indian vocabularies, etc. The activities of this library for the last fiscal year are described in the report of the chief of the bureau, by whom the library is administered.

LANGLEY AERONAUTICAL LIBRARY

In my last report, I mentioned that the aeronautical collection of the Institution was to be raised to the dignity of a division of the Smithsonian library, and named after Samuel Pierpont Langley, the third secretary, whose researches and experiments marked the establishment of aeronautics in the United States on a scientific basis. This has now been done, and the Langley aeronautical library, because of the rapidly developing interest in aeronautics, bids fair to become one of the prominent units of the Smithsonian library. While it is still comparatively small, numbering only about 1,600 volumes and 700 pamphlets, together with a large number of photographs and newspaper clippings, it includes many rare items, some of which were in the original nucleus as it came from Secretary Langley, and others among the additions made since by Alexander Graham Bell, Octave Chanute, and James Means. During the fiscal year just closed a shelf list was made for this library, an inventory was taken, and many parts missing from its sets were supplied. The accessions numbered 41. A catalogue of the library will soon be prepared.

NATIONAL GALLERY OF ART LIBRARY

The library of the National Gallery of Art, at present housed in the Natural History Building pending transfer to the special building which it is hoped will soon be erected for the gallery, is an important division of the Smithsonian library. While it totals only 704 volumes and 786 pamphlets, these have been so carefully chosen that the collection forms a valuable nucleus for the larger library in prospect. The collection was increased during the past year by 123 volumes, 738 parts of volumes, and 120 pamphlets. Gifts worthy of particular mention were made by Mr. J. U. Perkins and by Dr. William H. Holmes, director of the gallery. The latter's gift included two books of unusual interest—one a copy of the "Holmes Anniversary Volume," consisting of anthropological essays presented to Doctor Holmes by his friends and colaborers in honor of his seventieth birthday; the other a volume of 160 manuscript letters written by Doctor Holmes's friends in America and abroad in recognition of his eightieth birthday.

FREER GALLERY OF ART LIBRARY

The library of the Freer Gallery of Art is restricted to the interests represented by the collections of art objects pertaining to the arts and cultures of the Far East, India, Persia, and the nearer East; by the life and works of James McNeil Whistler and of certain other American painters whose pictures are owned by the gallery; and, further, to a very limited degree, by the Biblical manuscripts of the fourth and fifth centuries, which, as the possession of the Freer Gallery, are known as the Washington manuscripts. The library was increased during the year by 37 volumes and 151 pamphlets. It now has a total of 2,912 volumes and 2,519 pamphlets, many of which are in the Chinese and Japanese languages.

NATIONAL ZOOLOGICAL PARK LIBRARY

The library of the National Zoological Park comprises about 1,200 volumes and 300 pamphlets on animals and other subjects of interest to the park. It increased the past year by 21 volumes.

SUMMARY OF ACCESSIONS

The accessions for the year, with the exception of those to the library of the Bureau of American Ethnology, may be summarized as follows:

Library	Volumes	Pamphlets and charts	Total
Astrophysical Observatory.....	137	22	159
Freer Gallery of Art.....	37	151	188
Langley aeronautical library.....	30	11	41
National Gallery of Art.....	123	120	243
National Zoological Park.....	21		21
Smithsonian deposit, Library of Congress.....	4,046	415	4,461
Smithsonian office.....	146	10	156
United States National Museum, including the technological library.....	2,492	1,299	3,791
Total.....	7,032	2,028	9,060

An estimate of the number of volumes, pamphlets, and charts in the Smithsonian library, not including those in the library of the Bureau of American Ethnology, on June 30, 1927, was as follows:

Volumes.....	521,103
Pamphlets.....	141,285
Charts.....	24,155
Total.....	686,543

This number does not include the many thousands of parts of volumes in the library awaiting completion of the volumes.

SPECIAL ACTIVITIES

In addition to the regular work of the year, several special tasks were undertaken.

The intensive effort to complete the broken sets, both in the main collections and in the sectional libraries, begun the previous year, was continued with excellent results, and thanks are due the Library of Congress and hundreds of learned societies and institutions the world over for their generous response to requests for numbers needed by the library.

Decided progress was made on the union catalogue, especially by the splendid work done by two members of the staff toward cataloguing the library of the Astrophysical Observatory. A beginning was also made in cataloguing some of the special collections in the sectional libraries, but, for lack of help, this work could not be carried far.

An important piece of work was the preparation of nearly 2,000 volumes for binding, of which 1,439 were sent to the bindery for the National Museum, and 49 for the Astrophysical Observatory. The rest will be sent early in the next fiscal year.

The work of reorganizing the technological library was continued with vigor, but, owing to the increasing difficulty of the task and the lack of help, was not completed. It will require at least another year of special effort.

Thousands of duplicates from the Smithsonian deposit and other divisions of the library were taken to the west stacks and filed, preparatory to being listed and exchanged. This work of bringing together the duplicates in the library is now nearing completion.

Another task that required no little time and care was the final checking of the holdings in the various divisions of the library for the forthcoming union list of serials.

Still another was the filing of 30,866 cards in the alphabetic and methodical sets of the Bibliographicum Concilium in the Museum library. This was almost twice the number filed the year before.

There was increased opportunity during the year for lending material on semipermanent charge to institutions where research is being conducted. A notable instance of this was the loan to the Johns Hopkins University of 104 titles from the Lacoë collection in paleobotany. Other loans of especial interest, as the items were rare in this country, were made to the University of Wisconsin and the California Academy of Sciences.

Mention might be made, too, that the library prepared an exhibit of books representing the different interests of the Institution and its branches, for the conference on the future held at the Institution in February.

CONCLUSION

On the whole, the year was one of progress toward solving the problems which have arisen in connection with the work of reorganizing the library that was begun three years ago. But the progress would have been far greater if funds had been at hand for buying more of the books and periodicals needed by the curators, for supplying in the standard sets the missing numbers that can not be obtained by exchange, and for employing enough trained workers not only to carry on more adequately the current work of the library but in particular to make available at the earliest possible moment the thousands of volumes and pamphlets now lying useless on the shelves, and to expedite the making of the union catalogue of which the Institution stands so much in need. For these purposes funds should be provided as soon as possible.

Respectfully submitted.

WILLIAM L. CORBIN, *Librarian.*

DR. CHARLES G. ABBOT,

Acting Secretary, Smithsonian Institution.

APPENDIX 10

REPORT ON THE PUBLICATIONS

SIR: I have the honor to submit the following report on the publications of the Smithsonian Institution and the Government bureaus under its administrative charge during the year ending June 30, 1927:

The Institution proper published during the year 10 papers in the series of Smithsonian Miscellaneous Collections, 1 annual report, and pamphlet copies of the 27 articles contained in the report appendix, and 3 special publications. The Bureau of American Ethnology published 2 bulletins and 1 special publication. The United States National Museum issued 1 annual report, 1 volume of proceedings, 7 complete bulletins, 3 parts of a bulletin, 1 complete volume, and 5 parts of four volumes in the series Contributions from the United States National Herbarium, and 55 separates from the Proceedings.

Of these publications there were distributed during the year 182,846 copies, which included 68 volumes and separates of the Smithsonian Contributions to Knowledge, 18,199 volumes and separates of the Smithsonian Miscellaneous Collections, 24,775 volumes and separates of the Smithsonian annual reports, 17,178 Smithsonian special publications, 110,580 volumes and separates of the various series of National Museum publications, 10,711 publications of the Bureau of American Ethnology, 74 publications of the National Gallery of Art, 66 volumes of the Annals of the Astrophysical Observatory, 40 reports of the Harriman Alaska Expedition, 779 reports of the American Historical Association, and 376 publications presented to but not issued directly by the Smithsonian Institution or its branches.

SMITHSONIAN MISCELLANEOUS COLLECTIONS

Of the Smithsonian Miscellaneous Collections, volume 73, 1 paper was issued; volume 75, 1 paper; volume 78, 6 papers; volume 80, 2 papers; in all, 10 papers.

VOLUME 73

No. 4. Opinions Rendered by the International Commission on Zoological Nomenclature. Opinions 91 to 97. October 8, 1926. 30 pp. (Publ. 2873.)

VOLUME 75

No. 4. Cambrian Geology and Paleontology, V. No. 4. Pre-Devonian Sedimentation in Southern Canadian Rocky Mountains. By Charles D. Walcott. April 2, 1927. Pp. 147-173, pl. 25, text figs. 14-22. (Publ. 2870.)

VOLUME 78

No. 3. The Classification and Distribution of the Pit River Indian Tribes of California. By C. Hart Merriam. December 31, 1926. 52 pp., 27 pls. (Publ. 2874.)

No. 4. Solar Activity and Long-Period Weather Changes. By Henry Helm Clayton. September 30, 1926. 62 pp., 13 text figures. (Publ. 2875.)

No. 5. The Distribution of Energy Over the Sun's Disk. By C. G. Abbot. October 12, 1926. 12 pp., 1 pl., 1 text fig. (Publ. 2876.)

No. 6. The Lyell and Freshfield Glaciers, Canadian Rocky Mountains, 1926. By J. Monroe Thorington. February 5, 1927. 8 pp., 12 pls. (Publ. 2911.)

No. 7. Explorations and Field Work of the Smithsonian Institution in 1926. April 21, 1927. 259 pp., 247 figs. (Publ. 2912.)

No. 8. The Flora of Barro Colorado Island. By Paul C. Standley. May 20 1927. 32 pp. (Publ. 2914.)

VOLUME 80

No. 1. Morphology and Mechanism of the Insect Thorax. By R. E. Snodgrass, Bureau of Entomology. June 25, 1927. 108 pp., 44 text figs. (Publ. 2915.)

No. 2. A Group of Solar Changes. By C. G. Abbot. April 25, 1927. 16 pp., 9 text figs. (Publ. 2916.)

SMITHSONIAN ANNUAL REPORTS

Report for 1925.—The complete volume of the Annual Report of the Board of Regents for 1925 was received from the Public Printer in November, 1926.

Annual Report of the Board of Regents of the Smithsonian Institution, showing operations, expenditures, and condition of the Institution for the year ending June 30, 1925. xii+633 pp., 84 pls., 77 text figs. (Publ. 2836.)

The appendix contained the following papers:

The spiral nebulae and the structure of space, by Carl Wirtz.

Immensities of time and space, by A. Vibert Douglas.

Certain aspects of high-pressure research, by P. W. Bridgman.

Lightning and other high-voltage phenomena, by F. W. Peek, jr.

Chemical elements and atoms, by G. Urbain.

The manufacture of radium, by Camille Matignon.

The chemistry of solids, by Cecil H. Desch.

Terrestrial magnetism in the twentieth century, by Daniel L. Hazzard.

Some causes of volcanic activity, by Arthur L. Day.

Geology in the service of man, by W. W. Watts.

The yeasts: A chapter in microscopical science, by A. Chaston Chapman.

Tropical cyclones and the dispersal of life from island to island in the Pacific, by Stephen Sargent Visser.

Isolation with segregation as a factor in organic evolution, by David Starr Jordan.

The biological action of light, by Leonard Hill.

Animal life at high altitudes, by Maj. R. W. G. Hingston.

The nest of the Indian tailor bird, by Casey A. Wood.

The needs of the world as to entomology, by L. O. Howard.

From an egg to an insect, by R. E. Snodgrass.

- The rôle of vertebrates in the control of insect pests, by W. L. McAtee.
 Carnivorous butterflies, by Austin H. Clark.
 The potato of romance and of reality, by W. E. Safford.
 The relation of geography to timber supply, by W. B. Greeley.
 The historical geography of early Japan, by Carl Whiting Bishop.
 The excavations of the sanctuary of Tanit at Carthage, by Byron Khun de Prorok.
 The Smithsonian Institution.
 Sir Archibald Geikie, by Sir Aubrey Strahan.
 Ned Hollister (1876-1924), by Wilfred H. Osgood.

Report for 1926.—The report of the executive committee and Proceedings of the Board of Regents of the Institution, and the report of the secretary, both forming parts of the annual report of the Board of Regents to Congress, were issued in pamphlet form in December, 1926.

- Report of the executive committee and Proceedings of the Board of Regents of the Smithsonian Institution for the year ending June 30, 1926. 11 pp. (Publ. 2878.)
 Report of the Secretary of the Smithsonian Institution for the year ending June 30, 1926. 135 pp. (Publ. 2877.)

The general appendix to this report, which was in press at the close of the year, contains the following papers:

- The new outlook in cosmogony, by J. H. Jeans.
 Influences of sun rays on plants and animals, by C. G. Abbot.
 On the evolution of the stars, by C. G. Abbot.
 Excursions on the planets, by Lucien Rudaux.
 High-frequency rays of cosmic origin, by R. A. Millikan.
 The present status of radio atmospheric disturbances, by L. W. Austin.
 Cold light, by E. Newton Harvey.
 Scientific work of the Maud expedition, 1922-1925, by H. U. Sverdrup.
 The romance of carbon, by Arthur D. Little.
 The cause of earthquakes; especially those of the eastern United States, by William Herbert Hobbs.
 The loess of China, by George B. Barbour.
 A visit to the gem districts of Ceylon and Burma, by Frank D. Adams.
 The history of organic evolution, by John M. Coulter.
 Barro Colorado Island Biological Station, by Alfred O. Gross.
 Geography and evolution in the pocket gophers of California, by Joseph Grinnell.
 How beavers build their houses, by Vernon Bailey.
 The mosquito-fish (*Gambusia*), and its relation to malaria, by David Starr Jordan.
 The effect of aluminum sulphate on rhododendrons and other acid-soil plants, by Frederick V. Coville.
 Eastern Brazil through an agrostologist's spectacles, by Agnes Chase.
 Our heritage from the American Indians, by W. E. Safford.
 The parasite element of natural control of injurious insects and its control by man, by L. O. Howard.
 Fragrant butterflies, by Austin H. Clark.
 The ritual bullfight, by C. W. Bishop.

The bronzes of Hsin-Chêng Hsien, by C. W. Bishop.

The Katcina altars in Hopi worship, by J. Walter Fewkes.

Omaha bow and arrow makers, by Francis La Flesche.

The National Park of Switzerland, by G. Edith Bland.

Samuel Slater and the oldest cotton machinery in America, by Frederick L. Lewton.

Preventive medicine, by Mark F. Boyd.

William Bateson, by T. H. Morgan.

H. Kamerlingh Onnes, by F. A. Freeth.

SPECIAL PUBLICATIONS

American Silurian Crinoids. By Frank Springer, Las Vegas, New Mexico. Associate in Paleontology, U. S. National Museum. December 20, 1926. 239 pp., 32 pls. Quarto. (Publ. 2871.)

Proceedings of the Conference on the Future of the Smithsonian Institution. February 11, 1927. 88 pp., 12 full-page illus.

Title page and contents, Smithsonian Miscellaneous Collections, vol. 77. 8 pp.

PUBLICATIONS OF THE UNITED STATES NATIONAL MUSEUM

During the year ending June 30, 1927, the Museum published 1 annual report, 1 volume of proceedings, 7 complete bulletins, 3 parts of a bulletin, 1 complete volume and 5 parts of 4 volumes in the series Contributions from the United States National Herbarium, and 55 separates from the proceedings.

The issues of the bulletin were as follows:

Bulletin 100. Contributions to the Biology of the Philippine Archipelago and Adjacent Regions. Volume 2, part 5. The Shipworms of the Philippine Islands. By Paul Bartsch. Volume 6, part 2. Additions to the Polychaetous Annelids collected by the United States Fisheries steamer *Albatross*, 1907-1910, including one new genus and three new species. By A. L. Treadwell. Volume 6, part 3. Report on the Hydroida collected by the United States Fisheries steamer *Albatross* in the Philippine Region, 1907-1910. By Charles C. Nutting.

Bulletin 134. Material Culture of the People of Southeastern Panama, based on specimens in the United States National Museum. By Herbert W. Krieger.

Bulletin 135. Life Histories of North American Marsh Birds. Orders Odontoglossae, Herodiones, and Paludicolae. By Arthur Cleveland Bent.

Bulletin 136. Handbook of the Collection of Musical Instruments in the United States National Museum. By Frances Densmore.

Bulletin 137. The Collection of Primitive Weapons and Armor of the Philippine Islands in the United States National Museum. By Herbert W. Krieger.

Bulletin 138. The Fossil Stalk-Eyed Crustacea of the Pacific Slope of North America. By Mary J. Rathbun.

Bulletin 139. Fire as an Agent in Human Culture. By Walter Hough.

Bulletin 140. Bird Parasites of the Nematode Suborders Strongylata, Ascariata, and Spirurata. By Eloise B. Cram.

Of the separate papers of the Contributions from the United States National Herbarium the following were issued:

Volume 22, part 10. The North American Species of Scutellaria. By Emery C. Leonard.

- Volume 23, part 5. Trees and Shrubs of Mexico. (Bignoniaceae-Asteraceae.)
By Paul C. Standley.
- Volume 24, part 8. The Grasses of Ecuador, Peru, and Bolivia. By A. S. Hitchcock.
- Volume 26, part 1. The Lecythidaceae of Central America. By H. Pittier.
- Volume 26, part 2. The Piperaceae of Panama. By William Trelease.

Of the separates from the proceedings, 20 were from volume 69, 23 from volume 70, and 12 from volume 71.

PUBLICATIONS OF THE BUREAU OF AMERICAN ETHNOLOGY

The editorial work of the bureau has continued under the direction of the editor, Mr. Stanley Searles.

During the year two bulletins and one special publication were issued.

- Bulletin 82. Archeological Observations North of the Rio Colorado, by Neil M. Judd. 171 pp., 61 pls., 46 figs.
- Bulletin 83. Burials of the Algonquian, Siouan and Caddoan Tribes West of the Mississippi, by David I. Bushnell, jr. 103 pp., 37 pls., 3 figs.
- List of publications of the Bureau of American Ethnology.

Publications in press or in preparation are as follows:

- Forty-first Annual Report. Accompanying papers: Coiled Basketry in British Columbia and Surrounding Region (Boas, assisted by Haeberlin, Roberts, and Teit); Two Prehistoric Villages in Middle Tennessee (Myer).
- Forty-second Annual Report. Accompanying papers: Social Organization and Social Usages of the Indians of the Creek Confederacy; Religious Beliefs and Medical Practices of the Creek Indians; Aboriginal Culture of the Southeast (Swanton); Indian Trails of the Southeast (Myer).
- Forty-third Annual Report. Accompanying papers: The Osage Tribe; Two Versions of the Child-naming Rite (La Flesche); Wawenock Myth Texts from Maine (Speck); Native Tribes and Dialects of Connecticut (Speck); Picuris Children's Stories, with Texts and Songs (Harrington); Iroquoian Cosmology.—Part II (Hewitt).
- Forty-fourth Annual Report. Accompanying papers: Excavation of the Burton Mound at Santa Barbara, California (Harrington); Social and Religious Usages of the Chickasaw Indians (Swanton); Uses of Plants by the Chippewa Indians (Densmore); Archeological Investigations—II (Fowke).
- Bulletin 84. A Vocabulary of the Kiowa Language (Harrington).
- Bulletin 85. Contributions to Fox Ethnology (Michelson).
- Bulletin 86. Chippewa Customs (Densmore).

REPORT 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 communicated by him to Congress as provided by the act of incorporation of the association.

The annual report for 1921, part 1 of the annual report for 1922, and the supplemental volume to the report for 1923 were issued

during the year. Part 2 of the annual report for 1922 and the supplemental volume to the report for 1924 were in press at the close of the year.

REPORT OF THE NATIONAL SOCIETY, DAUGHTERS OF THE AMERICAN
REVOLUTION

The manuscript of the Twenty-ninth Annual Report of the National Society, Daughters of the American Revolution, was transmitted to Congress, in accordance with the law, January 8, 1927.

SMITHSONIAN ADVISORY COMMITTEE ON PRINTING AND PUBLICATION

The editor has continued to serve as secretary of the Smithsonian advisory committee on printing and publication, to which are referred for consideration and recommendation all manuscripts offered to the Institution and its branches. Five meetings were held during the year and 83 manuscripts acted upon.

Respectfully submitted.

W. P. TRUE, *Editor.*

Dr. C. G. ABBOT,

Acting Secretary, Smithsonian Institution.



THE UNIVERSITY OF CHICAGO
DEPARTMENT OF CHEMISTRY
RESEARCH REPORT NO. 1000

BY
J. H. GOLDSTEIN AND
R. L. SEXTON
DEPARTMENT OF CHEMISTRY
UNIVERSITY OF CHICAGO
CHICAGO, ILLINOIS 60637

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RESEARCH REPORT NO. 1000

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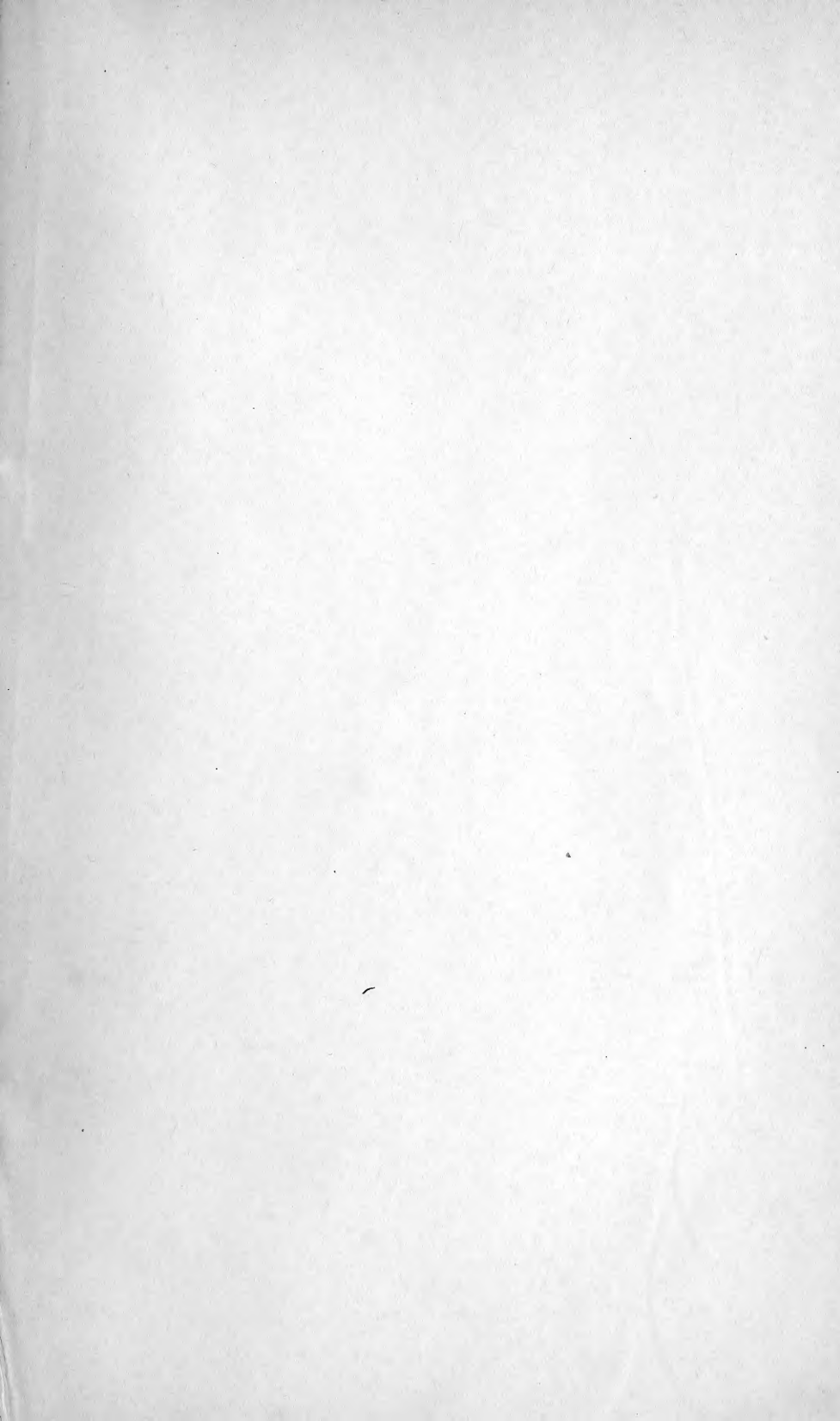
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