REPORT OF THE SECRETARY OF THE SMITHSONIAN INSTITUTION

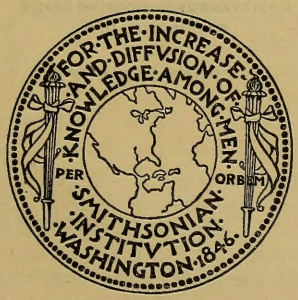
1928

SMITHSONIAN INSTITUTION
WASHINGTON
D. C.

REPORT OF THE SECRETARY OF THE SMITHSONIAN INSTITUTION

FOR THE YEAR ENDING JUNE 30

1928



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THE SMITHSONIAN INSTITUTION

June 30, 1928

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REPORT

OF THE

SECRETARY OF THE SMITHSONIAN INSTITUTION

C. G. Abbot

FOR THE YEAR ENDING JUNE 30, 1928

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, 1928. The first 28 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; and Appendix 11 contains a list of subscribers up to October 15, 1928, to the James Smithson Memorial Edition of the Smithsonian Scientific Series.

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: Senator Woodbridge N. Ferris died on March 23, 1928, and Senator Claude A. Swanson was appointed to succeed him on March 28, 1928. The board also lost by death the Hon. Henry White and Mr. Charles F. Choate, jr., and their places were filled by the appointment of the Hon. Charles Evans Hughes on December 21, 1927, and Dr. John C. Merriam on December 21, 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, Joseph T. Robinson, Claude A. Swanson; members from the House of Representatives, Albert Johnson, R. Walton Moore, Walter H. Newton; citizen members, Robert S. Brookings, Missouri; Irwin B. Laughlin, Pennsylvania; Frederic A. Delano, Washington, D. C.; Dwight W. Morrow, New Jersey; Charles Evans Hughes, New York; and John C. Merriam, Washington, D. C.

GENERAL CONSIDERATIONS

Elected on January 10, 1928, to be Secretary of the Smithsonian Institution, it became my duty to study the nature of the Institution, its sources of strength, and the most effective ways in which it may advance the mission of its founder, James Smithson, "for the increase and diffusion of knowledge among men."

To the casual observer it may appear that the most important function of the Smithsonian is the administration of the public Museum, art galleries, and Zoological Park confided to its direction. In these days of easy travel the number of those who walk through the National Museum, the Freer Gallery, and the Zoological Park reaches several millions each year. The educational value is great, though

doubtless the influence exercised on the minds of many visitors is rather of the nature of the agreeable spending of a few hours. It would be interesting to determine the geographical dispersion of the benefits from these exhibition features of the Smithsonian. Almost certainly, however, it would be found that chiefly the District of Columbia, Maryland, and Virginia, after them the Eastern States, and then, with rapidly growing sparseness of distribution, the more distant States and foreign countries partake of these benefits.

Contrast with this comparatively local influence the wider reach of the International Exchange Service, as associated with the publications of the Institution. Its first Secretary, Joseph Henry, perceiving the isolation of science in the America of 1850, created, as one of the first Smithsonian activities, a system of exchange of its publications, receiving in return those of the learned institutions of the Old World. Having established at strategic points in other countries many agencies for such exchange, he offered the use of the system freely to the learned institutions of the United States. Along with this new departure he also inaugurated that of the free distribution of numerous copies of Smithsonian publications to selected libraries all over this country and the world. From such exchanges came to the Institution that still-continuing steady stream of foreign and domestic scientific literature, which largely makes up the Smithsonian deposit of some half million volumes in the Library of Congress, and the eight extensive libraries retained in the Institution itself. This Government, and foreign governments as well, have appreciated the merit of this world-wide interchange of ideas which Secretary Henry inaugurated, and by treaty have built on the Smithsonian's foundation the present International Exchange System.[1]

Here, then, is a permanent and world-wide activity, originally Smithsonian, promoting international good will at the same time that it gives a powerful stimulus to the promotion of science and to the initiation of good intellectual activities, wherever instituted. As evidences of its effectiveness for good will, let me only say that owing to it one finds the golden torch symbolic of the Smithsonian Institution shown with pride on the shelves of libraries all over the world; that it was through the exchanges that Belgian libraries recovered many sets of American and other publications after the Great War; and that Japanese libraries were rehabilitated after the disastrous earthquake.

In the west hall of the Smithsonian Building the visitor sees a column of books four square, 23 feet high, with this legend:

Smithsonian Institution publications only. No duplicates. One thousand five hundred copies of each distributed world-wide free.

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[1] See report on p. 85.

In the last 50 years scarcely one scientific textbook has appeared which does not owe something to these publications.

They include not only technical descriptions of original research of specialists in many lines, but also timely, readable, yet authoritative accounts of many of the principal scientific developments of our time.

Not less world-wide in distribution and value than its activities for its diffusion are the Smithsonian's accomplishments for the increase of knowledge. In consideration of our present status let me draw attention to several unique advantages which render the Institution responsible for the cultivation of research. The National Museum, the Bureau of American Ethnology, the Freer collections, and, to a lesser extent, the Zoological Park, contain much of the basis on which research in natural history and ethnology must forever depend. What the public sees in the National Museum is not a tithe of its national wealth. The study collections which crowd the laboratories and corridors of the Natural History Building and Smithsonian Building represent the fauna, flora, geology, paleontology, and ethnology of our country and other regions. They contain thousands of type specimens, to which the scientific world looks as standards. They include thousands of series exhibiting the modifying influences of environment. They contain specimens which were collected many years ago, and of which the march of progress has now forever cut off the possibility of duplication.

Extensive researches of scientific value, and not infrequently of immediate practical utility, have already been based on this material. But one who has any conception at all of the opportunity can not but be impressed with Smithsonian responsibility. Not only must the task of collecting and preserving specimens of the fauna, flora, ethnological, and paleontological material at present available be diligently pushed forward, lest they be forever lost, but the intensive study of the collections must also be a major task, lest the lessons they might teach should be lost to our generation.

Joseph Henry was not only one of America's foremost men of vision and of action, but a great physicist. In his time the physical sciences, physics, chemistry, mathematics, astronomy, meteorology were ardently cultivated by the Smithsonian. Yet for many years past the Institution's principal contribution to research in such lines has been in its administration of the Astrophysical Observatory. There has been trained there a corps of investigators whose expert knowledge of the conditions governing the flow of radiation and of heat is a valuable asset, and a large collection of special apparatus lies in their care. During the years that they have devoted to studies of solar and terrestrial radiation there has at length developed a public demand for progress in our knowledge of the relations of radiation

to climate, to the growth of plants, and to the health of human beings. I feel that to march resolutely into these fields of investigation, which involve not only physics but chemistry, mathematics, meteorology, and astronomy, is a policy dictated to the Smithsonian not only by its possession of these assets of experience and apparatus but by the traditions of its early history, by the interests of its founder, James Smithson, who was a research chemist, and by a proper appreciation of the salutary influence which such a rounding out of the scope of Smithsonian researches would exercise on studies in the other lines associated with the national collections.

Thus I am led to feel that the care of the public exhibits, educational and interesting though they are, after all is not the greatest duty of the Smithsonian Institution. I see in the collection of new specimens which the passage of a few more years might prevent forever; in the study of existing national collections to unlock the treasures of knowledge which they certainly contain; in the promotion of researches growing out of our expert experience in the field of radiation; in the publication of knowledge in both technical and popular forms; and in the wide diffusion of knowledge through exchanges and correspondence in all these lines, activities entirely suited to the genius and situation of the Smithsonian, which in their world-wide application and future promise, outrank in value the more local influence of the public exhibitions.

Only one thing is lacking to promote these researches. We have the foundation equipment, we have the trained experts, but we lack adequate means. The Government appropriations are mainly devoted, according to the terms of law, to expenditures incident to the preservation of collections. But a small proportion of these annual congressional appropriations is available to be expended on collecting specimens or on researches. An exception occurs, it is true, in the Bureau of American Ethnology and the Astrophysical Observatory, where research is supported by Government. For research in far eastern lands, the Freer bequest is available, but, agreeable to the donor's wishes, only in a restricted sense. Also the Roebling and Canfield foundations have made possible a certain amount of collecting in the field of mineralogy.

Aside from these and certain other lesser financial resources for specified purposes, there remains the annual income of the Smithsonian endowment, which at present yields about $65,000 annually, and such temporary grants for special researches as interested friends from time to time place in the hands of the Institution. Secretaries Henry, Baird, Langley, and Walcott all deplored the disparity between Smithsonian endowment and Smithsonian opportunity, but until recently the outlook for increased support has been

discouraging. Nor is it very adequate even yet. However, I note with satisfaction the following items of gain or promise.

1. Gifts to the unrestricted endowment from donors mentioned last year and this (approximately)	$60,000
2. Prospective bequests already disclosed (approximately)	700,000
3. Annual income set free July 1, 1928, by Government assumption of certain overhead	25,000
4. Expected royalties from Smithsonian Scientific Series for the calendar year 1928	20,000
5. Allotment for radiation research from the Research Corporation of New York	15,000

We hope to enlist the interest of other donors to build up the unrestricted endowment of the Smithsonian to such an extent as to yield an assured annual income of not less than $500,000.

While it has not been possible under existing financial circumstances to push strongly into the fields of research and publication which I have indicated above, gratifying progress has been made with the means we have. A fuller account of the researches will appear from place to place below, but I note among indications of progress the following:

1. To make space for laboratories and offices associated with the work proposed in radiation and its applications to plant growth and human health, improvements planned to include an elevator, lighting, heating, and finishing, at the estimated expense of $15,000, will make available eight rooms, each of nearly 200 square feet, in the flag tower of the Smithsonian Building, which hitherto, being inaccessible to humans, has been occupied mainly by owls, bats, and pigeons.

2. In cooperation with the New York Commission on Ventilation, Mr. Aldrich, of the Astrophysical Observatory, has done a novel, interesting, and successful research on the cooling of the human body by radiation and convection.

3. In cooperation with the Fixed Nitrogen Laboratory, research has been started on relations of radiation to plant growth and on the measurement of certain ultra-violet rays.

4. Among 30 expeditions relating to the natural-history sciences, and reported upon in later pages by the chiefs of the National Museum, the Bureau of American Ethnology, and the Freer Gallery, an important group relates to the archeology, the fauna, the flora, and the paleontology of the West Indian Archipelago. This group of islands, so near our continent, yet separated from it for several geological epochs, is of interest as illustrating the cumulative influence on life of moderate changes of environment continued over a long period of time. Other newly worked and interesting fields of recent Smithsonian exploration lie as far apart as Alaska, Mexico, South America, South Africa, China, and the East Indies. These expedi-

tions were mostly financed by small grants from interested friends of the Institution.

FINANCES

The permanent investments of the Institution consist of the following:

Total endowment for general or specific purposes (exclusive of Freer funds), itemized as follows	$1,594,301.50
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	502,969.00
Springer, Frank, fund for researches, etc	30,000.00
Walcott, Charles D., and Mary Vaux, fund for researches, etc	11,520.00
Younger, Helen Walcott, fund (held in trust)	49,812.50
	1,594,301.50

The invested funds of the Institution are described as follows:

Fund	United States Treasury	Consolidated fund	Separate funds	Total
Avery fund	$14,000.00	$44,244.60		$58,244.60
Bacon, Virginia Purdy, fund		62,272.93		62,272.93
Baird, Lucy H., fund		1,783.88		1,783.88
Canfield Collection fund		46,232.86		46,232.86
Casey, Thomas L., fund		1,000.00		1,000.00
Chamberlain fund		35,000.00		35,000.00
Endowment fund		41,542.80		41,542.80
Habel fund	500.00			500.00
Hachenberg fund		5,000.00		5,000.00
Hamilton fund	2,500.00	500.00		3,000.00
Henry, Caroline, fund		1,425.45		1,425.45
Hodgkins fund:				
General	116,000.00	37,275.00		153,275.00
Specific	100,000.00			100,000.00
Hughes, Bruce, fund		16,108.72		16,108.72
Myer, Catherine W., fund		18,649.43		18,649.43
Pell, Cornelia Livingston, fund		3,000.00		3,000.00
Poore, Lucy T. and George W., fund	26,670.00	24,847.89		51,517.89
Reid, Addison T., fund	11,000.00	9,810.48		20,810.48
Rhees fund	590.00	523.38		1,113.38
Roebling fund		150,000.00		150,000.00
Sanford, George H., fund	1,100.00	955.18		2,055.18
Smithson fund	727,640.00	1,516.40		729,156.40
Springer, Frank, fund			$30,000.00	30,000.00
Walcott, Charles D., and Mary Vaux, fund			11,520.00	11,520.00
Younger, Helen Walcott, fund			49,812.50	49,812.50
Stock dividends not yet credited to various funds		1,280.00		1,280.00
Total	1,000,000.00	502,969.00	91,332.50	1,594,301.50

The Institution gratefully acknowledges gifts from the following donors:

Dr. W. L. Abbott, for archeological explorations in Dominican Republic.

Mr. William N. Beach, for expenses of naturalist in connection with African expedition.

Estate of Frederick A. Canfield, for expenses of Canfield collection of minerals.

Mrs. Laura Welsh Casey, for establishment of Thomas Lincoln Casey fund to maintain Casey collection and promote research in Coleoptera.

Estate of William H. Dall, for preparation of bibliography.

Mrs. E. H. Harriman, for purchase of Dall library.

Mr. Marcus Daly, for purchase of African natural history specimens.

Mr. Childs Frick, for further exploration in vertebrate paleontology.

New York Commission on Ventilation, for study of radiation from human body.

Mr. E. W. Marland, for Missouri Historical Society, for further studies of language of Osage Indians.

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

Research Corporation, for researches in solar radiation.

Mr. Charles T. Simpson, for further work on West Indian shells.

Mr. James M. Fowler, toward expenses of installing airplane, Spirit of St. Louis.

Mr. Joe Elliott, toward expenses of installing airplane, Spirit of St. Louis.

Mr. W. Sheffield Cowles, toward expenses of installing airplane, Spirit of St. Louis.

Mrs. Josephine M. Springer, for work in connection with Springer collection.

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

The Institution also acknowledges gifts for the endowment fund from the following friends:

Mr. Dwight W. Morrow.

Mr. R. D. Berry.

Mr. John F. Kennefick.

The Institution has received from the estate of George P. Hachenberg notes to the equivalent of $5,000 as a bequest to the Institution for general scientific purposes; also from the estate of Catherine Walden Myer real-estate notes to the amount of $14,618, representing final payment of 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:

Court and grounds fund	$394,574.09
Court and grounds, maintenance fund	81,586.40
Curator fund	330,022.46
Residuary legacy	3,462,061.31
Total	4,268,244.26

The practice of depositing on time in local trust companies and banks such revenues as may be spared temporarily has been con-

tinued during the past year, and interest on these deposits has amounted to $5,215.32. The income during the year for general expenses, consisting of interest on permanent investments and other miscellaneous sources, amounted to $63,136.14. Revenues and principal of funds for specific purposes, except the Freer bequest, amounted to $244,929.43. Cash capital from sale or call of securities other than Freer bequest (for reinvestment) amounted to $58,350.50. Revenues on account of Freer bequest amounted to $286,705.06; amount received as gain from sale of stocks and bonds, Freer bequest, was $61,069.72; cash capital from sale or call of securities, Freer bequest (for reinvestment), $519,416.35, aggregating a total of $1,233,607.20.

The disbursements, described more fully in the annual report of the executive committee, are classed as follows: General objects of the Institution, $63,663.15; for specific purposes (except the Freer bequest), $283,686.87; cash capital (except Freer bequest) reinvested, $59,157.75; Freer bequest, operating expenses of gallery, etc., $152,412.99; Freer bequest funds invested, $89,058.50; Freer bequest cash capital reinvested, $550,086.02.

The total of balances on hand June 30, 1928, of all funds, and mainly bearing interest on deposit, was $238,369.41.

The following appropriations were made by Congress for the Government bureaus under the administrative charge of the Smithsonian Institution for the fiscal year 1928:

International exchanges		$46,855
American ethnology		58,720
International Catalogue of Scientific Literature		7,260
Astrophysical Observatory		32,060
Additional assistant secretary		7,500
National Museum:		
Furniture and fixtures	$26,500	
Heating and lighting	79,500	
Preservation of collections	473,510	
Building repairs	13,000	
Books	1,500	
Postage	450	
Gallery	12,500	
		606,960
National Gallery of Art		30,356
National Zoological Park		175,000
National Zoological Park, building for birds		25,000
Printing and binding		90,000
Total		1,079,711

EXPLORATIONS AND FIELD WORK

During the past year the Smithsonian conducted 30 expeditions, a few of them financed solely from the meager funds of the Institu-

tion itself, but the majority made possible through the generosity of friends of the Institution or through arrangements with other agencies equally interested in the advancing of knowledge.

Besides 18 States of the United States, Smithsonian parties worked in Alaska, the Canadian Rockies, Labrador, Mexico, Colombia, Chile, Argentina, Brazil, the West Indies, including Hispaniola, Cuba, and Jamaica, several countries in Europe, South West Africa, Formosa, Sumatra, Siam, and China. The branches of the Institution interested in field exploration are the National Museum, the Bureau of American Ethnology, the Astrophysical Observatory, and the Freer Gallery of Art. Many of the expeditions are described in the reports of these bureaus, which form appendixes to this report, or in the Smithsonian Exploration Pamphlet, published annually.

SMITHSONIAN SCIENTIFIC SERIES

During the year a definite agreement became effective with the Smithsonian Institution Series (Inc.), of New York, to publish and distribute a series of 12 books, to be known as the Smithsonian Scientific Series, under the editorship of the Secretary. The books are intended to present an interesting picture of many of the scientific activities of the Institution and its branches, and are to be written in popular style, profusely illustrated. The first four volumes are expected to appear in the autumn of 1928 and the other eight will follow in two groups of four at intervals of several months.

The first four books were in proof at the close of the fiscal year and the others were in various stages of preparation. The titles of the first four books are as follows:

1. The Smithsonian Institution, by W. P. True.
2. The Sun and the Welfare of Man, by C. G. Abbot.
3. Minerals from Earth and Sky, by G. P. Merrill and W. F. Foshag.
4. North American Indians, compiled from the source material of the Bureau of American Ethnology by R. A. Palmer.

Two motives prompted the Institution to undertake the publication of this series: First, the desire to promote the diffusion of knowledge, and second, the desire to add to its insufficient resources for research and publication. It is hoped that the royalties accruing to the Institution from the sale of these books will continue over a long period and will contribute substantially to its available resources for scientific work.

The list of subscribers to the James Smithson Memorial Edition will be found[1] in Appendix 11.

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[1] Brought up to date as of Oct. 15, 1928, when the manuscript of this report went to the printer.

RESEARCH CORPORATION

The Research Corporation of New York, for the administration of inventions and new industrial processes in the public interest, was founded in 1912 through the gift by Dr. Frederick G. Cottrell and his associates of valuable patents covering processes for the electrical precipitation of dust, smoke, and chemical fumes. The net profits from the commercial application of the patents are used to aid and encourage technical and scientific research. The Smithsonian has always been in close relationship to the Research Corporation, the late Secretary Charles D. Walcott having served as a director since its inception, and this year the present Secretary was elected to membership on the board of directors.

In February, 1928, the directors of the corporation having expressed an interest in the solar radiation research program of the Institution, a statement of the proposed work was given them, with the result that in March a grant of $15,000 was made to the Institution to promote investigations on the relation of radiation to the growth of plants, the effects of radiation on the health and growth of animals and human beings, and the dependence of world weather on solar radiation.

COOPERATIVE ETHNOLOGICAL AND ARCHEOLOGICAL INVESTIGATIONS BETWEEN THE SMITHSONIAN INSTITUTION AND STATE, EDUCATIONAL, AND SCIENTIFIC INSTITUTIONS

At the past session of the Congress, the following act authorizing cooperation in ethnological and archeological investigations was enacted:

[Public, No. 248, Seventieth Congress]

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Secretary of the Smithsonian Institution is hereby authorized to cooperate with any State, educational Institution, or scientific organization in the United States for continuing ethnological researches among the American Indians and the excavation and preservation of archeological remains.

SEC. 2. That there is hereby authorized to be appropriated, out of any money in the Treasury not otherwise appropriated, the sum of $20,000, which shall be available until expended for the above purposes: *Provided,* That at such time as the Smithsonian Institution is satisfied that any State, educational institution, or scientific organization in any of the United States is prepared to contribute to such investigation and when in its judgment such investigation shall appear meritorious, the Secretary of the Smithsonian Institution may direct that an amount from this sum equal to that contributed by such State, educational institution or scientific organization, not to exceed $2,000, to be expended from such sum in any one State during any calendar year, be made available for cooperative investigation: *Provided further,* That all such cooperative work and division of the result thereof shall be under the direction of the

Secretary of the Smithsonian Institution: *Provided further*, That where lands are involved which are under the jurisdiction of the Bureau of Indian Affairs or the National Park Service, cooperative work thereon shall be under such regulations and conditions as the Secretary of the Interior may provide.

Approved, April 10, 1928.

The appropriation of $20,000 authorized by the above act was made in the deficiency act, approved May 29, 1928. The following regulations for the carrying out of the project were promulgated by the Institution:

1. From the above appropriation, the Secretary of the Smithsonian Institution may approve expenditure of a sum equal to that provided by any State or educational or scientific organization, not exceeding $2,000 in any one State in any one year, when satisfied that such State or organization is prepared to contribute to such investigation, and when in his judgment cooperation by the Institution in such investigation is justified.

A. Requests for cooperation should be made by the responsible officer of the State, educational institution, or scientific organization interested.

B. Applications should be accompanied by full explanatory statements of the work proposed, the location, purpose, and any other pertinent details, the name of the field representative, if any, of the applicant, and should state whether any supervisory salaries are to be paid from that portion of the joint fund provided by the applicant; and if so, the amount thereof. It is intended that all funds provided for such cooperative work shall be devoted strictly to the prosecution of definite projects contemplated by the act and shall not be used for the payment of regular salaries or other regular expenses of any organization.

C. Applicants must present suitable evidence of the availability of funds for cooperative use and will present at regular intervals detailed accounts of expenditures therefrom. Full instructions will be furnished regarding expenditures from allotments by the Institution, which must be made to conform with the accounting regulations of the United States Treasury Department.

D. A report covering each cooperative investigation, including copies of all maps, charts, photographs, or other notes relating to the work shall be filed with the Smithsonian Institution by the leader of the joint investigation within a reasonable period following its completion. It is contemplated that a proper report embodying the results obtained will be prepared for publication by the leader or his agent within a reasonable time.

2. The act provides that "all such cooperative work and division of the result thereof shall be under the direction of the Secretary of the Smithsonian Institution." The leader of any joint investigation must be approved or designated by the Secretary, who may at any time, if in his judgment it be desirable, send a representative to the scene of operations to inspect the work, at the expense of the allotment made for the particular investigation concerned.

3. Any cooperative investigation involving lands under the jurisdiction of the Departments of the Interior, or of Agriculture, will be subject to such rules as the secretary of the department having jurisdiction may impose.

In accordance with the terms of the act cited above, an allotment of $500 was made on June 19 to Mr. P. E. Cox, State archeologist of Tennessee, to be used in conducting an ethnological and archeological survey of that portion of the proposed Great Smoky Mountains Park lying within the State of Tennessee. As the work had not actually

been begun at the close of the fiscal year, it will be described in my next report, together with such other cooperative projects as may be undertaken during the coming year under the congressional appropriation for that purpose.

PRESENTATION OF THE LANGLEY MEDAL TO COL. CHARLES A. LINDBERGH AND THE DEPOSIT OF THE "SPIRIT OF ST. LOUIS" IN THE NATIONAL MUSEUM

In my last report, announcement was made of the award on June 11, 1927, of the Langley medal to Col. Charles A. Lindbergh for his nonstop flight from New York to Paris.

The actual presentation of the gold medal to Colonel Lindbergh took place in the Smithsonian Building on December 8, 1927, at the annual meeting of the Board of Regents. In presenting the medal Chief Justice Taft, chancellor of the Institution, said in part:

Colonel LINDBERGH:

The Langley medal was established in memory of the third secretary of the Smithsonian Institution, Samuel Pierpont Langley. During the last 15 years of his life Doctor Langley's primary interest was in making possible man's flight. In this research he conducted active experiments in the lift and drift of planes, and the properties of curved surfaces, constructed large steam-driven models as early as 1896, which flew long distances, and finally he attempted to construct a man-carrying machine, which was wrecked in the two trials which it had during his lifetime. * * * Following the advice of an eminent committee of award, the medal is now presented to you, sir, in recognition of your daring nonstop flight from New York to Paris of May 20 and 21, 1927. I have the honor and pleasure of presenting the medal to you on behalf of the Regents of the Smithsonian Institution.

Permit me to add that the whole bearing and tendency of your life prior to, during, and since your memorable flight, as the light of publicity is more and more thrown upon it, has greatly enhanced the pleasure which my colleagues and I take in presenting you this award. May your future work go far to establish the dream of your desire, the wide and useful promotion of the subject of commercial aviation.

In accepting the medal, Colonel Lindbergh said:

First, I want to express my appreciation of this honor which you have just given me, and also to thank you as the board of the Smithsonian Institution for the interest you have taken in aeronautics. At a conference in St. Louis among those interested in these fields it was decided that when the *Spirit of St. Louis* was taken from service it would be offered to the Smithsonian Institution for permanent exhibition here.

The *Spirit of St. Louis* was piloted on its last flight from St. Louis to Washington by Colonel Lindbergh on April 30, 1928, and turned over to the Institution. It was placed on public exhibition in the Arts and Industries Building of the National Museum on May 13, 1928, where it faces the main entrance in a pose strongly suggesting actual flight, and immediately became the mecca for thousands of visitors

daily. It promises to be for a long time to come the most popular exhibit in the whole National Museum, and the thanks of the Nation are due Colonel Lindbergh and his friends in St. Louis for placing the famous plane in the national collection.

WALCOTT MEMORIAL MEETING

In accordance with resolutions adopted by the Board of Regents on the day following the death of Charles Doolittle Walcott, Secretary of the Institution from 1907 to 1927, a memorial meeting was held on January 24, 1928, in the auditorium of the National Museum, which was attended by a large number of Doctor Walcott's friends and official associates. Chief Justice William H. Taft, chancellor of the Institution, presided. In his introductory remarks he reviewed very briefly the many-sided career of Doctor Walcott in scientific research and in public service, and concluded by saying that the meeting was being held "in memory of a man whose work promoted real scientific investigation and discovery in his particular field, who was a shining example of a Government civil servant of the highest ideals and success, and who for 20 years gave greatly of his energies and the hardest kind of labor to expanding the usefulness of the Smithsonian Institution."

The first speaker was Dr. John C. Merriam, president of the Carnegie Institution of Washington, who considered Doctor Walcott's scientific work, emphasizing particularly his contributions to the study of the early life of the earth, as to the structure of ancient animals, their biological classification, their faunal grouping, or their succession in time. "In all these aspects of the problem," said Doctor Merriam, "his accomplishments belong to the first rank of the world's researches." He spoke also of Doctor Walcott's continuous service to the Carnegie Institution from the time of its organization until his death. He was one of the original incorporators and a member of the first board of trustees, and contributed largely to the accomplishments of the Carnegie Institution during the 25 years of his association with it.

Dr. Joseph S. Ames, professor of physics at Johns Hopkins University and chairman of the National Advisory Committee for Aeronautics, spoke of Doctor Walcott's relations with that committee. With the coming of the World War Doctor Walcott was one of the few who realized the importance of a national survey and study of aeronautics, and it was he who secured the passage of an act establishing the National Advisory Committee. His relations with it were summed up by Doctor Ames thus: "He created it; he planned its duties wisely; he guided and inspired it; he secured the appropriations for its support. Each year he took more interest and pride

in its operation. There can be no doubt that from all this he himself received his reward of pleasure and satisfaction."

Doctor Walcott's service to the United States Geological Survey was presented by Dr. George Otis Smith, director of the survey. Here was shown Walcott's exceptional capacity for the dual duties of research and administration, and during the 13 years of his directorship the Geological Survey had its greatest growth. He found time also at this period to sponsor the development of reclamation projects, national forests, national parks, fuel-testing plants, and mine-safety stations. "Charles Walcott was great as the scientist, famed the world over; he was great as the public official, honored the length and breadth of his own country; he was also great as the man in his home, among his friends in this community."

Dr. Charles G. Abbot, present Secretary of the Smithsonian Institution, spoke in conclusion of "Doctor Walcott, the Smithsonian Secretary and National Academy President." His successful methods of administration of the Institution were touched upon, and his long service to the National Academy outlined. In closing Doctor Abbot said that "the Smithsonian Institution may well be proud of its fourth secretary and the National Academy of its ninth president."

The full proceedings of the Walcott memorial meeting were printed in the Smithsonian Miscellaneous Collections, the pamphlet including a complete bibliography of Doctor Walcott's published writings, numbering 272 titles.

PRESENTATION OF PORTRAIT OF THE SECRETARY

Mrs. Samantha L. Huntley presented to the Institution a portrait of Dr. C. G. Abbot, fifth secretary. In offering the portrait, Mrs. Huntley wrote:

> It has given me much pleasure to paint this portrait, and I hope you will accept it for the Institution with my sincere wishes for your success in the administration of its affairs.

The portrait is at present hung in the National Gallery of Art.

PUBLICATIONS

The four series issued by the Institution proper are the Smithsonian Annual Reports, the Smithsonian Contributions to Knowledge, the Smithsonian Miscellaneous Collections, and Smithsonian Special Publications, while other series are published by several of the bureaus under the direction of the Institution, including the National Museum, the Bureau of American Ethnology, the Astrophysical Observatory, and the National Gallery of Art. Copies of all of these publications are distributed free to a large list of libraries,

learned societies, and specialists throughout the world, and certain of the less technical publications, such as the Smithsonian Reports and Smithsonian exploration pamphlets, are widely distributed among the general public.

In the General Appendix to the Smithsonian Report of each year are included 25 to 30 articles selected from the periodical literature of the world to show advances and interesting features of all branches of science.

During the past year the Institution published 117 volumes and pamphlets, of which there were distributed altogether 183,196 copies, including 29,720 volumes and separates of the Smithsonian Annual Reports, 26,099 volumes and separates of the Smithsonian Miscellaneous Collections, 5,878 Smithsonian Special Publications, 111,405 publications of the National Museum, and 9,126 publications of the Bureau of American Ethnology. The titles of the papers, number of pages, and other bibliographical information are given in the report of the editor of the Institution, Appendix 10.

The following sentence occurs in a letter received by the editor from the chief of the Smithsonian Division in the Library of Congress:

> The Smithsonian Report is one of the most constantly called-for publications we have here in the Library of Congress.

The annual pamphlet issued by the Institution describing the year's explorations and field work covered 30 expeditions to all parts of the world and was illustrated with 213 photographs taken by the Smithsonian field workers. An innovation in the latest pamphlet, in the desire to make it more attractive to the general reader, was to present the accounts in the form of short separate articles, written in the first person and each signed by the author, instead of as impersonal reports as heretofore.

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 virtually used up at the close of the year. The appropriation for the coming year ending June 30, 1929, totals $95,000, allotted as follows:

Annual report to the Congress of the Board of Regents of the Smithsonian Institution	$11,500
National Museum	46,500
Bureau of American Ethnology	28,300
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 publications.—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 seven meetings were held and 107 manuscripts were considered and acted upon. The membership at the close of the year was 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, 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 Smithsonian library is comprised of the Smithsonian deposit in the Library of Congress, which is the main library of the Institution, 8 divisional libraries relating to the work of the bureaus under the Institution, and 36 sectional libraries maintained for use in individual offices. The accessions for the year, exclusive of those of the Bureau of American Ethnology, were 6,838 volumes and 16,203 pamphlets and charts, a total of 23,041 items. This brings the estimated total of volumes, pamphlets, and charts in the Smithsonian library to 709,584, not including the library of the Bureau of American Ethnology, at present administered separately by the chief of that bureau, or the thousands of volumes awaiting completion or as yet uncatalogued.

The staff was augmented by provision for a second position of assistant librarian to act as chief of the accessions department—the department which acquires publications for the library, partly by purchase and gift, but mainly by exchange.

The two most noteworthy gifts for the year were the Chinese library of the late William W. Rockhill, consisting of 1,100 volumes, presented by Mrs. Rockhill, and a collection of 3,500 serial and society publications presented by the American Association for the Advancement of Science. A large number of the latter, including some that were out of print and very rare, were needed to complete sets in the various libraries of the Institution.

As usual many volumes and parts of volumes wanted for the Smithsonian deposit in the Library of Congress were obtained, and with the reorganization of the accessions department it is expected that this service will soon be greatly enlarged. Notable progress was made on the union catalogue of the Smithsonian library, espe-

cially in connection with the Smithsonian deposit, the office library, the Langley aeronautical library, and the libraries of the National Museum and the Astrophysical Observatory. The technological library was reorganized, and the reference room was greatly improved and made more attractive.

A number of special activities were undertaken during the year, including the sorting and distribution of a large accumulation of reprints; the making of a list, preparatory to cataloguing, of some of the special collections, including the Casey, Dall, Gill, Henderson, Lacoe, Roebling, Schaus, Springer, Teller, and Vaux; and work on the reorganization of the west stacks in the Smithsonian Building.

NATIONAL MUSEUM

The appropriations for the maintenance of the National Museum totaled $650,960, an increase of $41,640 over the preceding year. A large part of the increase was for the purpose of providing for a much-needed one-rate promotion for the staff, leaving a small sum available for purchase of specimens and certain other necessary matters. A special appropriation of $12,500 permitted the construction of a gallery in the National Herbarium, which was completed during the year, nearly doubling the available space for plants.

The two most important needs of the Museum to enable it to function efficiently and expand normally are for additional personnel and more adequate housing. There are several groups of collections with no specialist in charge, and in a number of divisions there are no assistants in training to carry on the work when the older men are gone. The two buildings of the Museum are filled to overflowing, both in the exhibition halls and in the study rooms. The older structure, built in 1881, is antiquated and should be replaced by a larger and more modern one, and the newer Natural History Building should be enlarged by the addition of two wings, as originally planned for by the architect.

Additions to the collections during the year reached the total of 832,912 objects, more than twice the number received during the previous year. Specimens given to schools numbered 6,267, and more than 25,000 specimens were loaned to specialists for study. I will mention here only a few of the outstanding accessions, and others will be found listed in the report of the assistant secretary, Appendix 1.

In the department of anthropology there was received an excellent series of ivory, bone, stone, pottery, and wooden objects representative of the Eskimo culture of Nunivak Island, Alaska, collected by Messrs. Collins and Stewart, of the Museum staff; a series of objects collected

by the Bureau of American Ethnology from a basket-maker village site in New Mexico; and a collection of stone graters, pestles, celts, and clay figurines collected by Assistant Secretary Wetmore in the mountains of the Dominican Republic. In the same Republic Mr. H. W. Krieger, working under the auspices of Dr. W. L. Abbott, collected an excellent series of bone and stone implements and potsherds near Samaná Bay.

The department of biology received the large majority of the year's accessions, the total for the department being 680,350 specimens. This great number is accounted for largely by the receipt of several extensive private collections, among them the C. F. Baker collection of insects of the Philippines and the East Indies generally, bequeathed to the Museum by the late Doctor Baker; the C. G. Lloyd mycological collection of 75,000 specimens of the larger fungi; the Charles W. Hargitt collection of hydroids; and the George M. Greene collection of Coleoptera. Important collections of natural history material came from Dr. Hugh M. Smith, in Siam, and from Mr. A. de C. Sowerby, working under the auspices of Col. R. S. Clark, in China. Mr. W. L. Brown, of the taxidermy staff, joined an expedition to the Sudan and brought back a valuable set of mammals, birds, and fishes. Important collections from Hispaniola came to the Museum through the work there of Assistant Secretary Wetmore, Dr. Gerrit S. Miller, jr., and Mr. A. J. Poole. Accessions to the division of plants included 9,000 specimens collected in Honduras by Mr. Paul C. Standley and 3,000 from Formosa and Sumatra, collected by Prof. H. H. Bartlett through cooperation of the Museum and the University of Michigan.

In geology many rare and important minerals were acquired under the Roebling fund established last year. Several beautiful gems and minerals were obtained through the Chamberlain fund, including a 65-carat cut gem of alexandrite; and the Isaac Lea collection received an unusual series of cut stones of sphene given by Miss Nina Lea, granddaughter of the founder of the collection. Dr. W. F. Foshag, of the Museum staff, collected a striking group of gypsum crystals and sets of valuable ores in Mexico. The Frank Springer collection of fossil echinoderms, a complete library on this subject, and a fund to promote work in connection with the collection came to the Museum through the bequest of the late Doctor Springer. In vertebrate paleontology there were acquired a skeleton of the extinct lizard *Clidastes*, one of the rare three-toed horses from the Miocene of Wyoming, and a further series of fossil footprints collected by Mr. C. W. Gilmore.

The outstanding accession in the arts and industries department and the object of greatest popular interest to be received by the Museum in many years is Colonel Lindbergh's *Spirit of St. Louis.*

Other interesting accessions in this department include the Pan American good-will flyer *San Francisco*, a White-Stanhope steam automobile of 1901–2, a collection of ancient and modern watch and clock movements presented by the New Haven Clock Co., an automatic gingham loom of the latest type presented by the Crompton & Knowles loom works, and the apparatus used in receiving the first photoradiogram across the Atlantic on November 27, 1924, when a picture of President Coolidge was sent from London and received in New York City in the office of the Radio Corporation of America, by whom this apparatus was deposited in the Museum. The division of history received an interesting series of relics of Rear Admiral Charles D. Sigsbee, given by Mrs. Nellie C. Gunther, and a number of ancient Roman and modern European and oriental coins deposited by the Treasury Department.

The Museum took part during the year in numerous field expeditions in this country and abroad, through which large and important collections were brought back for study and exhibition. A brief account of these will be found in the report on the Museum appended hereto. The auditorium and lecture rooms of the Museum were used for 115 meetings of governmental agencies, scientific bodies, and other associations and societies. The number of visitors to the Museum totaled 1,413,286 for the year, an increase of 260,000 over the previous year. There were published 10 volumes and 59 separate papers, and 111,405 copies of Museum publications were distributed.

NATIONAL GALLERY OF ART

The need of an adequate National Gallery building is more urgent than ever. Present quarters occupied by the gallery in the Natural History Building of the National Museum are grossly inadequate and are much needed by the Museum.

At the seventh annual meeting of the National Gallery of Art Commission, a resolution was adopted favoring the assemblage at some future date of the purchases made from the Henry Ward Ranger fund since its establishment, now numbering nearly 70, in order to enable the commission to make a selection of such works as the gallery desires to claim.

Lists of the art works offered to the gallery during the year and accepted by the commission and of the accessions to the gallery collections during the year, subject to the approval of the advisory committee of the commission, will be found in Appendix 2.

Four special exhibits were held in the gallery during the year: A collection of portraits by Bernard Österman; the annual exhibit of the Society of Washington Artists; a collection of paintings by

contemporary British artists; and the annual exhibition of the Washington Water Color Club. Among the withdrawals of loans to the gallery should be mentioned 20 old masters lent by Mrs. Ralph Cross Johnson in 1924, 14 paintings by British and Dutch masters lent by Henry Cleveland Perkins, Esq., in 1922, and the John H. McFadden collection of 43 British masters temporarily placed in the gallery in 1922.

Accessions to the gallery library numbered 1,096 volumes, pamphlets and periodicals, and 12 water-color paintings by Doctor Holmes, the gift of the artist.

FREER GALLERY OF ART

Additions to the collections in the Freer Gallery during the year include two pieces of Persian pottery, three of Chinese porcelain, and six Persian paintings dating from the thirteenth to the seventeenth century. The most important addition to the library was the Chinese library of the late William Woodville Rockhill, comprising 1,100 volumes.

Two hundred and twenty-four objects were submitted for expert opinion or for translation of their oriental inscriptions, and 34 translations were made of inscriptions from photographs submitted to the curator. In answer to a constantly increasing demand, there are now available for purchase 1,491 photographs of objects in the gallery in addition to 829 negatives of the Biblical manuscripts. The gallery sold during the year 1,089 photographs, 2,017 post cards, and 1,031 copies of gallery publications.

The total attendance for the year was 111,288; of these, 1,218 came to the office for special information, to study the building and methods, to see objects in storage, to make drawings, or for similar purposes. Thirty-three classes were given instruction, four groups were given docent service in the galleries, and two lectures were given in the auditorium.

The gallery's field work in China, in charge of Mr. C. W. Bishop, was suspended, owing in part to conditions there, and Mr. Bishop returned to Washington temporarily, visiting en route important archeological collections and sites in Egypt and the principal western European countries. In Washington he has been occupied chiefly in studying the material collected during four and a half years in China. Dr. C. Li and Mr. K. Z. Tung, the Chinese members of the field staff, stayed in China to maintain the contacts established there and to prepare for future field work. Mr. Li came to Washington in the summer of 1928 to discuss plans for future work in China.

BUREAU OF AMERICAN ETHNOLOGY

Dr. J. Walter Fewkes, chief of the bureau since March 1, 1918, retired on January 15, 1928, but was continued on the staff as associate anthropologist.

To facilitate the appointment of Doctor Fewkes's successor as chief of the bureau, a special unassembled examination was arranged by the Civil Service Commission, in consultation with the Secretary, for the purpose of establishing a list of eligibles. The ranking of applicants was done by a committee comprising a representative of the commission, the secretary of the Smithsonian, and Dr. A. V. Kidder, representing ethnological and archeological science at large. As a result, the appointment of Mr. Matthew William Stirling was made, to take effect August 1, 1928, just after the close of the fiscal year.

The work of the staff of the bureau has included ethnological researches relating to the Indians of the Southern States, the Sac and Fox, the Northern Arapaho, the Mission Indians of California, the Six Nations, the Chippewa, the Winnebago, and the Osage. Archeological work by Doctor Roberts in Chaco Canyon, N. Mex., and near Arboles, Colo., uncovered interesting village sites. Cooperating with the bureau, Messrs. Judd, Krieger, and Collins, of the National Museum, made archeological investigations in Kentucky, in the Columbia Basin of Oregon and Washington, and in western Alaska. Accounts of this ethnological and archeological work appear in the reports of the bureau and the Museum.

The bureau published during the year one annual report and one bulletin, and 9,126 copies of bureau publications were distributed.

INTERNATIONAL EXCHANGES

A total of 542,233 packages of publications were handled during the year, including those sent abroad and those received for distribution in this country. The total weight of this material was 584,121 pounds, an increase of 40,996 pounds over the previous year's total.

Burma and Bombay were added to the list of foreign depositories that receive sets of United States official documents, bringing the total number of such sets sent through the exchange service to 105. Rumania, which, since 1903, has received a partial set, now receives a full set. Shipments to Turkey, suspended since the World War, were resumed, the ministry of public instruction at Angora acting as the depository. The daily issue of the Congressional Record is now exchanged for the parliamentary journals of 101 foreign governmental bodies. Brazil, the Irish Free State, and Turkey were added to the list during the year.

The Italian Office of International Exchanges, formerly under direction of the Victor Emanuel National Library in Rome, was placed under the ministry of public instruction. The Dutch Central Scientific Bureau, exchange agency for the Netherlands, is now under the direction of the Royal Library at The Hague.

NATIONAL ZOOLOGICAL PARK

Although there was no important increase in the collection of animals during the year, nevertheless a number of interesting species new to the collection was added.

The total number of animals added was 336, while 459 were lost through death, return of animals, and exchange, leaving the collection at 2,273 individuals of 582 different species. A considerable number of animals was born in the park, as usual. Among the more serious losses by death were the two giraffes, Dot and Hi-boy, secured by the Chrysler expedition, a Kadiak bear which had lived in the Park for over 23 years, the last cheetah in the collection, a jaguar, and an anaconda which had been at the Park for just 28 years, a notable record of longevity for this snake.

The attendance for the year, although somewhat smaller than last year when the animals brought back by the Smithsonian-Chrysler African expedition attracted great crowds of visitors, was nevertheless higher than for any other year in the history of the park. The total number of visitors was 2,298,449. Classes from 445 different schools visited the park, comprising 27,959 students. A number of scientific societies officially visited the park, including the American Society of Mammalogists, the American Ornithologists' Union, and the Society of Icthyologists and Herpetologists; the Vivarium Society held monthly meetings at the Park.

The new bird house, mentioned in last year's report, was completed in June, 1928, and the installation of the birds was commenced, so that the building will be opened to the public during the summer. The structure has been highly praised by officials of other zoological parks and by the public. It is divided into four rooms, together containing 145 indoor cages, and in the center is a great flight cage 58 feet long, 22 feet wide, and 32 feet high, containing rocks, a large tree, a pool, and running water.

This new bird house is a great improvement to the park, but the director calls attention to the fact that after 20 years of earnest appeal for more adequate buildings to house the splendid collection of animals, the bird house is practically the only entirely satisfactory building in the National Zoological Park, the others being a continual source of unfavorable comment by visitors. He lists seven urgently needed structures which would cost in the neighborhood of

$1,000,000, namely: 1. Exhibition house for reptiles, amphibians, and invertebrates. 2. Ape, lemur, and small mammal house. 3. Pachyderm house. 4. Remodeling of the carnivore house. 5. Antelope, buffalo, and wild cattle house. 6. A wing to be added to the bird house, with open air aviaries. 7. A proper fence around the entire park.

ASTROPHYSICAL OBSERVATORY

The three field stations of the observatory, located at Table Mountain, Calif.; Montezuma, Chile; and Mount Brukkaros, South West Africa, have continued sending to the Smithsonian results of daily observation of the intensity of solar radiation, and the United States Weather Bureau published the daily values from Montezuma on the Washington weather maps.

A statistical study of the data accumulated at the Table Mountain station led Mr. Fowle to discover a hitherto unsuspected influence of variability in the ozone content of the atmosphere. Regular observations of ozone are now made at Table Mountain in cooperation with Doctor Dobson, of Oxford, England.

A new research undertaken by Mr. Aldrich under a grant from the New York Commission on Ventilation was on the proportion of loss of heat of the normally clothed human body which should be ascribed to radiation rather than to convection by the air. Long series of novel and valuable experiments were made, using the melikeron, or honeycomb pyranometer, for observing radiation of bodies at low temperature, and a special thermoelectric temperature tester constructed for the research. The interesting results obtained, which are summed up in the director's report appended hereto, will shortly be published.

The director undertook at Mount Wilson in the fall of 1927 and again in the summer of 1928 to continue radiometer measurements of the distribution of energy in the spectra of the stars. In the 1927 experiments the radiometer vanes, made of bits of house-flies' wings, were sealed into a glass case in hydrogen, but after many trials the apparatus proved useless because the mechanism required to rotate the system so stirred up the gas that wholly unexpected motions resulted. In 1928 an optically figured, fuzed quartz cylindrical vessel was used, which was mounted on a brass support rotatable in a ground joint. With this apparatus a high degree of success was achieved, but as the results were obtained after the close of the year under consideration, they will be described in next year's report.

INTERNATIONAL CATALOGUE OF SCIENTIFIC LITERATURE

Since actual publication of the International Catalogue was suspended in 1922, owing to the inability of the foreign bureaus to contribute their quota of the necessary financial support, the United States bureau has continued to compile the necessary records of current scientific publications. As explained each year to Congress and to the Bureau of the Budget, the expenditures for this purpose have been kept at the lowest possible level.

An effort was made to inaugurate a practical plan for resuming publication of the catalogue and the matter is still under negotiation. It seems probable that the various countries previously represented will again cooperate by furnishing the necessary bibliographical data if the small capital fund needed to start the operation of the central bureau and begin publication can be raised.

NECROLOGY

The Institution suffered the loss by death during the year of three distinguished members of the Board of Regents—Senator Woodbridge Nathan Ferris, Mr. Charles Francis Choate, jr., and the Hon. Henry White. These three men, in serving for varying periods on the board, have aided materially in advancing the work and reputation of the Institution, and their names will be added with gratitude to the long roster of distinguished men who have so served since 1846.

Woodbridge Nathan Ferris, United States Senator from Michigan, was born at Spencer, N. Y., January 6, 1853. He was principal successively of several academies and colleges in Illinois until 1884, when he founded the Ferris Institute, of which he thereafter served as president. In 1913 he was elected Governor of Michigan, being reelected in 1915. He was elected United States Senator from Michigan for the term 1923 to 1929, but died on March 23, 1928, before the completion of his term. Senator Ferris served on the Board of Regents for three years.

Charles Francis Choate, jr., lawyer, of Boston, Mass., had at the time of his death served on the Board of Regents for a longer period than any other living member, having been first appointed on February 24, 1908. He was born at Cambridge, Mass., on October 23, 1866, and was educated at Harvard University. He became president of the Appleton Co., and was a director of the New York, New Haven & Hartford Railroad Co., the Merchants National Bank of Boston, and the American Telephone & Telegraph Co. Mr. Choate

died on November 30, 1927, having therefore been a Regent of the Institution for nearly 20 years.

Henry White, diplomat, was born at Baltimore, Md., March 29, 1850. He received the degree of LL. D. from St. Andrew's University of Scotland, from Johns Hopkins University, and from Harvard University. He held various posts in the American diplomatic service, and was appointed secretary of the embassy at London in 1897. This office he held until 1905, when he was made American ambassador to Italy, and two years later ambassador to France. He represented the United States at a number of important conferences, including the Fourth Pan American Conference at Buenos Aires in 1910, when he acted as chairman of the American delegation. In 1918–19 he was a member of the American commission to negotiate peace, at Paris. Mr. White died on July 15, 1927. He served on the Board of Regents from January 15, 1917, until the time of his death.

JOSEPH NELSON ROSE

Joseph Nelson Rose, associate curator of botany in the National Museum, died at his home in Washington, May 4, 1928. Born at Liberty, Ind., in 1862, Doctor Rose received his education at Wabash College. In 1888 he was appointed assistant botanist in the Department of Agriculture. When the National Herbarium was transferred from that department to the Smithsonian Institution in 1895, Doctor Rose joined the Smithsonian's staff and here his botanical work was done for the rest of his life.

During his 40 years of original research Doctor Rose became a recognized authority on certain difficult families of plants. Most of his work was done under the Smithsonian Institution, but his well-known investigation of the cactus family was conducted under the auspices of the Carnegie Institution of Washington. In the course of this investigation he traveled extensively in the western United States, Mexico, and South America, and the results were published in four imposing volumes by the Carnegie Institution.

The gift of the private herbarium and botanical library of Capt. John Donnell Smith, of Baltimore, one of the most important ever received by the Institution, was brought about largely through the efforts of Doctor Rose. His published contributions to botanical knowledge number over 100.

IMMANUEL MOSES CASANOWICZ

Immanuel Moses Casanowicz, assistant curator of the division of Old World archeology in the National Museum, died September 26, 1927, at the age of 74. He was born at Zholudok, Russia, July 25,

1853, and studied at the University of Basle, Switzerland. Between 1880 and 1886 he was an instructor, first at the Evangelische Predigerschule at Basle, and later at the German Theological School of Newark at Bloomfield, N. J. In 1892 he received the degree of Ph. D. from Johns Hopkins University, and the same year entered the service of the National Museum, where he remained for the rest of his life.

Doctor Casanowicz was a recognized authority in the field of Old World archeology, specializing in the subject of comparative religions. He published several papers on the various religions of man, and at the time of his death another was left practically completed, which would have closed the series. He was a member of the American Oriental Society and vice president of the Anthropological Society of Washington. Doctor Casanowicz was a man of broad culture, and his place on the Museum staff will be difficult to fill.

FRANK SPRINGER

Frank Springer, associate in paleontology in the National Museum and a benefactor of the Institution, died September 22, 1927. He was born June 17, 1848, at Wapello, Iowa, and received his education at the State University of Iowa. Admitted to the bar in 1869, he went to New Mexico, where he soon became a leader of the bar of that State. He was instrumental in having a law passed by Congress establishing a tribunal for the settlement of titles under Spanish and Mexican land grants, and his greatest professional success was attained as attorney for the Maxwell Land Grant Co. He retired from active practice in 1906, and from that time on he devoted himself largely to the scientific work that he loved and that has placed him among the front rank of American paleontologists.

Doctor Springer's connection with the Smithsonian Institution began in 1911, when he brought his collection of fossil echinoderms to Washington and installed it in the National Museum, where office room and storage space for the collection were assigned him. He spent the winter and spring months of each year at the Museum carrying on his scientific work, and many of his papers were published by the Museum. His well-known quarto monographs, "The Crinoidea Flexibilia," "American Silurian Crinoids," and others were issued by the Smithsonian Institution.

By a deed of gift Doctor Springer's valuable collection and funds provided by him for its upkeep came to the Institution immediately after his death.

BRADSHAW HALL SWALES

Bradshaw Hall Swales, honorary assistant curator of birds in the National Museum, died January 23, 1928, at his home in Washington.

Mr. Swales was born in Detroit, Mich., June 30, 1875, and graduated from the University of Michigan in 1896 with the degree of LL.B., receiving his LL.M. the following year. In the latter part of 1897 he was admitted to the bar of Michigan and entered the practice of law in Detroit. In 1898 he went to Pasadena, Calif., to engage in his profession, but was forced by ill health to return east later in the same year.

Mr. Swales interest in birds began early in life, his first published paper appearing in 1889 when he was only 14 years of age. His complete bibliography of ornithological papers numbers just over a hundred titles, a large proportion of them relating to the birds of his native State of Michigan. From 1914 he was a member of the governing board of the zoological museum at Ann Arbor, and for some years was honorary assistant in ornithology. In 1918 he was appointed honorary custodian of the section of birds' eggs of the National Museum, and in 1921 was made honorary assistant curator of birds. He contributed to the Institution a fund known as the Swales fund, through which were added to the Museum's collections many genera and species of rare foreign birds. For several years he studied the birds of Haiti, and at the time of his death, had partly completed a work on the ornithology of that island undertaken jointly with Dr. Alexander Wetmore.

Mr. Swales was a member of many ornithological and natural history societies, and was a founder of the Baird Ornithological Club of Washington, D. C.

JOSEPH MACE

Joseph Mace, driver of the Smithsonian freight wagon for over 50 years, died on January 26, 1928. Mr. Mace served the Institution faithfully and with quiet loyalty under all five of its secretaries—Henry, Baird, Langley, Walcott, and Abbot—and his devotion to duty merits the highest praise.

Respectfully submitted.

C. G. Abbot, *Secretary.*

APPENDIX 1

REPORT OF 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, 1928:

The total appropriations for the maintenance of the National Museum for this period amounted to $650,960, an increase of $41,640 above the appropriation for the year 1927. This additional amount included an increase of $23,510 under the principal appropriation, that for preservation of collections, which provided funds for a one-rate promotion for the staff in accordance with efficiency attained in the performance of duty as indicated in the annual survey and rating of the efficiency of all employees, the total sum required for this being $19,070. An additional $2,280 was required for additions to the salary roll through reallocations of certain employees to higher grades made by the Personnel Classification Board. The remainder, which came to $2,160, was allotted to miscellaneous purchase of specimens required for the collections, to supplies, and to additional expenditures for freight. The small amount added for the purchase of specimens has been especially important since it has brought to us material of great scientific value, and has filled gaps of long standing in our collections. An increase of $2,770 under the appropriation for furniture and fixtures allowed $770 for new curtains in certain exhibition halls in the Natural History Building, and $2,000 for storage cases, drawers for insect collections, and additional jars, vials, trays, and other devices for general use in the handling and safeguarding of our tremendous collections. The addition of $1,360 in the appropriation for heating and lighting permitted a one-rate increase to employees with proper efficiency standing on the salary roll in question. Of $1,000 added to the amount available for building repairs, $60 was for a minor promotion to one employee, and $940 was provided to cover, in part, replacement and repair on the concrete roadway on the east side of the Natural History Building. The amount of $500 additional allotted to the sum for printing and binding raised this sum to $44,000. A special appropriation of $12,500 covered the construction of a gallery over the west end of the great hall housing the collections in the Division of Plants. Construction of this gallery, which was completed during the year, practically doubled the avail-

able space for plants, and besides permitting proper expansion of the collection, allowed for the incorporation of over 200,000 specimens, the accumulation of a number of years that it had been impossible to place in their proper series because of lack of space. This gallery, next to the provision for increase of salaries, has been the most important improvement that addition to appropriations has permitted during the year.

The increase in salaries, the first promotion of the kind that has been possible since the classification act was put into effect on July 1, 1924, has resulted in appreciably higher morale on the part of the personnel and has reacted most advantageously to the Museum. All promotions have been well merited.

To look ahead to a matter not properly included in this report but one pertinent in the present connection, an additional one-rate increase was provided by Congress for the fiscal year 1929, which, with the Welch Act put in effect at the same time, has placed the staff of the National Museum generally in greatly improved economic position and has thus reacted in producing greater efficiency in the performance of the work of the Museum. To carry out the full intent of the reclassification act there is required a further general increase in pay to place those of the staff with proper efficiency rating at the average rates of their respective grades. It must be noted also that there are several groups, particularly among the skilled mechanics, where the Personnel Classification Board, recognizing that the persons in question were being paid at lower rates than in other Government departments, has given reallocations to higher positions. Promotions should be given to these persons to give them proper compensation. Further additions to the appropriations, so that the various groups of salaries may attain the averages provided by law, are earnestly urged, as such action is eminently and properly the reward for conscientious performance of duty on the part of the staff and will react wholly to the advantage of the Institution.

The question of additional personnel is one of considerable importance, as there is growing necessity for further workers, both on the scientific staff and in the clerical force. The National Museum, through the many years of its growth, has developed along broad lines and now maintains extensive collections. In several groups in these collections there is now no specialist in charge, and in a number of divisions assistants should be provided for the older men now in charge who should be training others in proper methods to carry on when they themselves are gone. Each year additional cataloguers, stenographers, typists, and laborers must be employed temporarily to assist in the work of the Museum. It is often difficult to secure employees properly equipped for this work on short notice and, further, it is not always possible to give the considerable training that may be

required for proper performance of duty in a period of limited employment. At the present time men of high scientific training must take time for routine work that could properly, and with advantage to the public welfare, be done for them by others.

Congestion in our present housing space increases annually in spite of careful effort to select for preservation only the objects that must be kept and to eliminate all material that is not permanently desired. As an asset to the Nation the collections of the National Museum should be made as complete as possible, since in many instances, unless the materials are secured now, the opportunity to obtain them will be lost. Growth in our collections is therefore steady and must continue. In the last 10 years the exhibition halls, particularly those devoted to arts and industries and to history, have become increasingly more crowded. Exhibits in the Natural History Building have been curtailed to make way for historical objects, and space designed for anthropology has been preempted for display of objects of art. All this has led, in many instances, to decided incongruity in association of exhibits, which can not be avoided under present conditions. Conditions are equally bad in the laboratories. In the entire Museum the collection of plants is now practically the only research unit that has available the requisite amount of floor space. To provide room in other laboratories there has been gradual utilization of halls designed originally for passageways, until now cases for the storage of study specimens line the walls and to some extent close these passage lanes. The situation is such that the limit of expansion is practically reached, and a number of divisions are already urgently in need of more space to house their valuable research collections. Though to one with casual knowledge it might appear that one or two examples of each kind of thing is sufficient, it is actually true that good series are imperative for the scientific investigations of the workers to whom we look for increase in our knowledge. It is found on close examination that insects, birds, mammals, fossils of all kinds, plants, mollusks, or, in fact, any other natural materials or organisms, differ from each other individually in form, color, dimension, and structure, so that a series of specimens is required to show the characteristics of a single species. Such series must be assembled in our national collections, where they will be available for the workers of the Nation, so that inevitably our research materials, as well as our exhibitions, increase and demand more room.

Further housing for the National Museum, as indicated in the preceding paragraph, is imperative. The collections in arts and industries are found at present in the old museum, a building that when completed in 1881 was a model of its kind for the world, but with modern progress is as much out of date as vehicular trans-

portation of the same period when compared with our modern facilities. This building should be replaced now by one of modern design, that will afford a much greater area of floor space and will have halls properly designed for modern needs in exhibition. The new building should occupy the site now given to the one in use, but should cover considerably more ground to provide the needed space. Modern advances in commerce and industry are tremendous and so overshadow their modest beginnings that these will be completely forgotten by coming generations unless the essential steps in their development are preserved. The various stages of growth in all branches of transportation, engineering, and commerce are of inestimable value in affording material stages on which further advances may be made, to say nothing of their educational importance in their effect on the minds of our modern youth. They must be carefully preserved for this purpose.

When a national gallery of art to house our wonderful art collections shall be constructed the removal of these will free a certain amount of space in the Natural History Building, but the area left vacant will be automatically absorbed by the natural-history exhibits retired originally to make room for art. There should be added to the Natural History Building two wings, one on the east and one on the west, in accordance with the original plan of the architect, which, with the same height as the present building, will give needed space for our laboratories and will house our tremendously valuable research collections. In some divisions, as, for example, the rooms assigned to the collections of insects, working conditions have become almost intolerable because of the increasing number of persons necessarily engaged in important research, so that now in some instances four persons must depend upon the light from a single window for illumination in work requiring delicate examination under the microscope. Additional space in this building would provide for a more logical arrangement of many exhibits and a remodeling of some in a more modern form, which can not be attempted at present, and would also give relief from present crowding, which often is tiring and confusing to the visitor.

The division of history, a division of the greatest importance to every patriotic American, with its wonderful series of memorabilia of those to whom we owe our country and our freedom, its collections of weapons, war materials, historical objects of all kinds, its great series of coins and stamps, at present has its exhibits distributed through the Natural History and the Arts and Industries Buildings in a manner which does not permit orderly display. There should be provided for it a separate building, where its treasures may be adequately shown for the admiration and reverence of our people for generations to come. Certainly all these historic objects, not to be

duplicated at any price, should be displayed under the best of conditions as a monument to those whom they represent and to the earlier generations of those who have built our Nation.

With increase in material wealth in the United States there has been developed a steadily growing class of persons who turn to intellectual labors for occupation and aesthetic enjoyment. Many of these, carefully trained in some one of the sciences, make definite contributions to knowledge. Others deeply interested care rather to assist in the labors of others than to make definite additions through personal efforts. All are of tremendous assistance in carrying on the important work of science. All have a sincere belief in the value of scientific research in all branches and are deeply interested in furthering it in any way possible. When it is remembered that these persons, through their economic situation, make large and definite annual contribution to the support of the Federal Government through the sums that they pay in the form of income tax, it must be admitted that it is only logical to take a small part of this contribution and devote it to the maintenance, growth, and preservation of the valuable materials found in the National Museum.

COLLECTIONS

Additions to the collections of the National Museum during the fiscal year have reached the tremendous total of 832,912 separate objects, the largest number coming to the department of biology. Material sent for examination and report amounted to 1,481 lots, including many thousands of specimens. Gifts to schools and other educational institutions numbered 6,267 specimens, while in exchange there were sent out 33,724 specimens, these being duplicate materials for which other things were received in return. More than 25,000 specimens of all kinds, many of them highly valuable, were loaned for study to specialists and other workers outside of Washington.

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

Anthropology.—During field work on Nunivak Island, Alaska, Mr. Henry B. Collins, jr., and Mr. T. Dale Stewart collected an excellent series of ivory, bone, stones, pottery, and wooden objects that give a comprehensive index to the culture of the Eskimo on this island. Mr. Oscar T. Crosby presented a series of specimens, personally collected, representing the ethnology of the African bushmen.

Among valuable collections which have been received through the field work of the Bureau of American Ethnology there may be mentioned especially a series of materials from a basket-maker village site and a near-by pueblo in Chaco Canyon, N. Mex. There may be noted also a small collection of stone graters, pestles, celts, and a con-

siderable number of clay figurines collected personally by the assistant secretary in the mountains of the Dominican Republic, and a further series of earthenware vessels and stone and bone ornaments secured by Mr. Neil M. Judd from Pueblo Bonito and presented by the National Geographic Society.

Through work financed by Dr. W. L. Abbott, Mr. H. W. Krieger secured an excellent series of bone and shell implements and potsherds near Samana Bay, Dominican Republic. Excellent series of prehistoric stone implements were secured by exchange with the Indian Museum in Calcutta, and the National Museum of Australia. Further accessions from the Old World include collections made in France by Dr. George Grant MacCurdy and deposited by the Archæological Society of Washington.

The Division of Physical Anthropology obtained a fine collection of human skeletal material from the work of Mr. Collins and Mr. Stewart on Nunivak Island already mentioned, and a further collection of skulls and skeletons from the west coast of Florida obtained by Mr. Collins, in work financed by the Bureau of American Ethnology.

Biology.—Specimens received in the department of biology during the fiscal year reached the enormous total of 680,350, a large increase over the preceding year due principally to certain extensive private collections that have come to the Museum. Chief among these is the C. F. Baker collection of insects, formed by Doctor Baker, dean of the College of Agriculture in Los Banos, P. I., and left by him on his death to the Museum. In order to obtain this material it was necessary to send Mr. R. A. Cushman, of the Bureau of Entomology, assistant custodian of hymenoptera in the Museum, to Manila to pack the collection and see that it was transferred safely to Washington, an arrangement that was possible through the cooperation of the United States Department of Agriculture. The series included is one of the finest ever assembled of the insects of the Philippine Islands, and is also rich in general East Indian material. The C. G. Lloyd mycological collection, comprising 75,000 specimens of the larger fungi, was transferred to the Smithsonian Institution during the year by the trustees of the Lloyd estate. There are included in addition 10,000 photographic negatives of fungi, a voluminous series of notes pertaining to the specimens, and a comprehensive card catalogue. The whole comprises one of the largest and most important collections in the group ever brought together. Among other accessions, the Charles W. Hargitt hydroid collection is especially important, as it represents the lifetime work of this well-known specialist.

Through Dr. Hugh M. Smith, associate curator in zoology, director of fisheries of Siam, there came important collections of mammals,

birds, reptiles, fishes, insects, mollusks, and miscellaneous invertebrates. Further series came from China through the courtesy of Col. R. S. Clark from the work of Mr. A. de C. Sowerby, of especial importance being some excellent series of fishes. Through the cooperation of Mr. William N. Beach, Mr. Marcus Daly, and Mr. Osgood Field, the Museum was able to send Mr. W. L. Brown, of the staff in taxidermy, to the Sudan, where he obtained a valuable set of mammals, birds, and fishes of importance in our collections. A group of gazelles obtained will be mounted for the exhibition halls. Eight female gorilla skulls were acquired by purchase.

Mr. B. H. Swales, honorary assistant curator of birds, whose death came during the year, contributed 4 genera and 26 species of birds new to the Museum collections. The collections of Doctor Wetmore, assistant secretary, made last year when traveling under the Swales fund in Hispaniola, included series of birds, reptiles, and amphibians, and other zoological collections of a miscellaneous nature. The work of Mr. Gerrit S. Miller, jr., curator of mammals, who visited the Dominican Republic at his own expense, and that of Mr. A. J. Poole, of the division of mammals, who carried on extensive explorations in the caves of Haiti, under funds provided by Dr. W. L. Abbott, brought important collections of bones of extinct animals and birds, as well as excellent series of existing reptiles and amphibians and other specimens of value.

Among accessions in the division of insects there may be mentioned the gift of the George M. Greene collection of coleoptera, including nearly 50,000 specimens, and representing many years of careful and painstaking work. Through Dr. R. C. McGregor, the Philippine Bureau of Science has forwarded large series of Philippine insects, while other important additions to these collections have come through the work of the Bureau of Entomology. Prof. T. D. A. Cockerell presented a collection of insects from Russia and Siberia.

The Amory-Bowman Labrador expedition, arranged through cooperation with Mr. Copley S. Amory, brought collections from the coast of Labrador, including a comprehensive set of arthropods. The Bureau of Fisheries, United States Department of Commerce, transferred 5,467 specimens of marine invertebrates, the most important being from the *Albatross* expeditions of 1907–1909, which have been in the hands of specialists for study to this time, and a series of crustacea procured from Harvey C. McMillan.

Through the Francis Lea Chamberlain fund the division of mollusks obtained over 50,000 specimens of land shells from Jamaica, which were collected by C. R. Orcutt. Dr. Charles de la Torre, of Habana, Cuba, presented 185 lots of mollusks, mostly types of new species.

In the division of plants important accessions have included 9,000 specimens collected in Honduras for the Museum by Mr. Paul C. Standley; more than 5,000 specimens, mainly grasses, transferred from the Bureau of Plant Industry; and nearly 3,000 from Formosa and Sumatra, representing a complete set of the material collected by Prof. H. H. Bartlett, collaborator of the Museum, under the joint auspices of the National Museum and the University of Michigan.

Geology.—Under the Roebling fund, established last year, there have been secured by purchase examples of four new species of minerals; some rare minerals from Franklin Furnace, N. J., now difficult to procure; a large mass of strongly magnetic lodestone from Utah, which attracts much attention in our exhibition halls; and a number of beautiful minerals for the exhibition and study series. These constitute highly important additions to our collections which otherwise it would have been impossible to procure, illustrating the value of special funds under the Smithsonian Institution for the purchase of needed specimens.

There may be mentioned also a 65-carat cut gem of alexandrite, one of the finest in existence, secured under the Chamberlain fund, together with a fine Mexican opal, a brown diamond, and some other beautiful minerals. Miss Nina Lea, grandaughter of Isaac Lea, founder of the Isaac Lea collection, presented an unusual series of cut stones of sphene. Mr. William P. Pitts, of Sunnyvale, Calif., presented five varieties of cut semiprecious stones, with examples of the rough minerals from which they were derived.

During field work in Mexico by Dr. W. F. Foshag, assistant curator of mineralogy and petrology, working in cooperation with Harvard University, groups of gypsum crystals, sets of valuable ores, and many other important specimens were collected.

Through the bequest of Dr. Frank Springer, late associate in paleontology, the Museum has received the Frank Springer collection of fossil echinoderms, together with a very complete library on this subject. The collection, considered the most complete assemblage of fossil echinoderms in the world, comprises upward of 75,000 specimens, including many types. With it has come the Springer fund, established by the donor to promote work in connection with his collection.

A second gift of value is the private collection of paleozoic invertebrates from Dr. August F. Foerste, collaborator in paleontology, containing types of many species. The field work of Mr. E. R. Pohl in Michigan and Ontario yielded important series of Ordovician, Devonian, and Mississippian fossils.

Transfers from the United States Geological Survey have included collections of Upper Cambrian fossils secured by T. S. Lovering in Colorado, and other important collections.

The division of vertebrate paleontology acquired by purchase the skeleton of an extinct lizard *Clidastes* and one of the rare three-toed horses from the Miocene of Wyoming. A further collection of fossil footprints came through Mr. Gilmore's third visit to the Grand Canyon, while work in Florida by Dr. J. W. Gidley has brought important material from the Pleistocene deposits of that State.

The types of five species of fossil birds described recently by Doctor Wetmore have been deposited by the Colorado Museum of Natural History.

Arts and industries.—The single object of greatest popular interest that has come to the National Museum in many years is Colonel Lindbergh's airplane, the *Spirit of St. Louis*, deposited with the Smithsonian Institution, which has drawn large crowds since the first day of its installation. There may be mentioned also the Pan American good-will flyer *San Francisco*, transferred from the War Department, with the Army Curtiss racer airplane which won the Pulitzer and Schneider races of 1925. A Curtiss pusher type airplane of the period 1909–1914 is also an important addition. For the land transportation section there was secured a White-Stanhope steam automobile of 1901–2. Mr. Guy M. Gest, who piloted the first electric railway car operated in Baltimore in 1885, presented a series of photographic enlargements of this vehicle from his original negatives. The Hudson River Day Line presented two steamship models, one of Fulton's steamboat of 1807, and one of the *Hendrick-Hudson* built in 1906 and still in service.

The New Haven Clock Co. presented to the section of horology 75 objects illustrating ancient and modern watch and clock movements, together with an exhibit demonstrating how standard time is obtained, the whole constituting a visual history of American clock and watch making since 1775.

The Eddystone Cement Co., through Mr. E. R. Wilmer, presented a 5-foot section of an ancient Roman aqueduct built in 80 A. D. in Germany. The structure, which resembles rough concrete, is in a remarkable state of preservation, being apparently as strong to-day as ever.

The division of textiles received further exhibits dealing with rayon or artificial silk. The Crompton & Knowles loom works presented an automatic gingham loom of the latest type. The Bureau of Agricultural Economics of the Department of Agriculture transferred three sets of official standards of the United States for grades of wool. A series of the new print silks, prepared by H. R. Mallinson & Co., was another important addition.

In the section of organic chemistry there was received an exhibit dealing with pyrolin, manufactured by the Du Pont Viscoloid Co.,

and from the Shawinigan Products Corporation a series of chemical specimens obtained from limestone and coke. An additional exhibit dealing with disease-carrying insects was prepared in the Museum during the year and added to the hygiene and sanitation collection.

In the section of wood technology arrangement was made for the loan of a collection of walking sticks belonging to Mr. Rudolph Block, the collection consisting of the interesting woods of the world prepared in the form of canes, a series unique so far as is known.

In the division of graphic arts the Misses Dodge presented a set of 24 engravings by Moseley Isaac Danforth, one of America's foremost engravers. Through exchange the division obtained a copy of a book by Dard Hunter entitled "Primitive Paper Making," made entirely by hand. Mr. William Edwin Rudge donated four examples of microform printing, including a volume of Mark Twain's The Innocents Abroad, in which 93,000 words are printed on 13 pages measuring 5¾ by 3¾ inches. A collection of the work of Henry Fox Talbot was presented by a descendant, Miss M. Talbot, O. B. E., of Lacock Abbey, Wiltshire, England. Mr. I. N. Phelps Stokes presented a series of specimens of considerable historic importance relating to Muybridge's work on motion pictures.

The Radio Corporation of America deposited the apparatus used in receiving the first photoradiogram across the Atlantic—a picture of President Coolidge sent from London and received on November 27, 1924, in the office of the company in New York City.

History.—Mrs. Agnes K. Brent, through the Missouri Historical Society, gave a silk flag presented by the ladies of Nashville, Tenn., to the Nashville Battalion during the Creek War in 1813. The naval collections were increased by a series of interesting relics of Rear Admiral Charles D. Sigsbee, given by Mrs. Nellie C. Gunther.

From the Treasury Department there was received a series of United States gold, silver, and bronze coins struck in the mints of the Government in 1927; also a series of ancient Roman and modern European and oriental coins. Mr. Isaac M. Weills presented a collection of American and European coins and tokens.

The philatelic collection was increased by more than 27,000 specimens, in part transferred from the Post Office Department and in part presented by Mr. Weills, with the coins mentioned above. Two United States 5-cent stamps found in the seam folds of the mail bag carried by Commander Byrd on his flight to France in the airplane *America* were also placed in this collection.

The Precancel Stamp Society, through Mr. Walter L. Gates, continued its development of the collection of precancel stamps, a series augmented by gifts from Mr. Gates personally.

To the Loeb collection of chemical types 102 samples were added during the year, bringing the total number of specimens to 1,092. There is assurance of hearty cooperation in developing this collection.

EXPLORATIONS AND FIELD WORK

Through explorations financed by special funds made available by friends of the Institution, through a variety of cooperative arrangements with other organizations, and to some extent from funds provided under the Museum appropriations, there have come many valuable specimens and much new information in various fields of science. A brief résumé of some of the important explorations and field work under the National Museum follows:

In the Alaskan field, Mr. Henry B. Collins, jr., and Mr. T. Dale Stewart, under funds supplied by the American Association for the Advancement of Science, the Council of Learned Societies, and the United States National Museum, conducted field work during the summer of 1927 on Nunivak Island, on the Bering Sea coast of Alaska. Explorations of several ancient village sites were carried out and anthropological measurements of the natives and observations on their social life were made. In addition much anthropological material was gathered during landings along the coast on the journey to the site of the season's investigations. The material collected includes an excellent series of skeletal remains and numerous valuable objects of material culture.

Mr. Herbert W. Krieger, through a grant from the National Academy of Science, and funds supplied by the Bureau of American Ethnology, visited the old site at Bonasila, Alaska, for remains that had attracted Doctor Hrdlička's attention the year before. Unforeseen high water in the Yukon prevented complete examination, but important information and specimens dealing with ancient Eskimos were obtained. He also collected ethnologica from Eskimo in several villages on the Yukon. During this same season Mr. Krieger continued archeological investigations along the Columbia and Snake Rivers, bringing in many specimens, some of which, from the Snake, appear to represent an outlying site of Pueblo Indian culture.

Mr. Neil M. Judd, on detached detail, worked for the seventh field season at Pueblo Bonito, in Chaco Canyon, N. Mex., as director of the National Geographic Society's archeological exploration of that ancient pueblo. Through the interest of the society there has been uncovered and set in order for inspection of the public one of the largest pueblos of the prehistoric period as it stood perhaps 1,000 years ago. Mr. Judd was occupied this season principally in obtaining final data for incorporation in his report. The investigations as a whole have given extensive and valuable series of objects dealing with comparatively late pueblo culture, which through the generous gift of the National Geographic Society have greatly enhanced the Museum collections in the pueblo culture of the Southwest.

At the close of the fiscal year Mr. Judd was in the field for the Bureau of American Ethnology, examining caves in Russell County, Ky., where textiles and other interesting specimens had been exhumed.

Dr. Aleš Hrdlička, traveling partly under a grant from the Smithsonian Institution and partly at personal expense, was in Europe for seven weeks in the fall of 1927 for the purpose of viewing the latest discoveries of early man. He examined sites of important finds in southern France and then proceeded to Belgium and later to Germany, where he visited the localities in the Neander Valley typical for the race of Neanderthal man. In southern Moravia he investigated the area that had recently given important finds in Aurignacian man, and continued then to Paris for work on the material accumulated there in the Museum of Natural History and to London for examination of the collections in the College of Physicians and Surgeons. While in London he was the recipient of the Huxley medal of the Royal Society for his extensive investigations and researches in anthropology and delivered the Huxley lecture on "The Neanderthal Phase of Man."

Dr. Walter Hough in the early fall of 1927 examined for the Bureau of American Ethnology a large burial mound at Indian Mound, Tenn., to determine the type of slab-box burial. He also visited near-by village sites, flint quarries, and burial grounds, obtaining a considerable amount of material. In one of the village sites on the Cumberland River there were obtained numerous shells of mollusks of a species now extinct in that stream.

Mr. H. B. Collins, jr., during January, 1928, visited for the Bureau of American Ethnology areas near Fort Myers, Fla., where mounds of the Calusa Indian type were reported. He obtained skeletal remains of considerable importance with respect to the racial identity of this people, who, though they existed within historic times, have become extinct and are comparatively little known.

In February, 1928, Mr. H. W. Krieger, under funds provided by Dr. W. L. Abbott, proceeded to the Samana Bay region of the northeastern coast of the Dominican Republic, and there carried on archeological investigations until April, working with Mr. G. S. Miller, jr., whose interest in this matter will be discussed in a later paragraph. Mr. Krieger visited a number of caves in the San Lorenzo Bay section, excavating extensive middens found therein, and obtaining much information of value. The middens, composed principally of shells and other kitchen refuse, were in places from 4 to 8 feet in thickness, and contained artifacts of various kinds. Following this, two Arawak village sites at Anadel and the mouth of the Rio San Juan on the Samana Peninsula, whose location had been indicated by Doctor Abbott from earlier observations, were excavated carefully with the recovery of many articles of scientific importance.

Officials of the Dominican Republic cooperated most courteously in furthering this work, which it is expected will be continued in the coming year.

The travels of Gabb in the seventies of the last century brought to Washington a few bones of curious mammals from the caves of San Lorenzo in the Dominican Republic, to which have been added further specimens obtained within recent years by Dr. W. L. Abbott. In May, 1927, Assistant Secretary Wetmore in travels in this region observed extensive midden deposits in these caves still untouched that gave promise of further material of importance. Mr. G. S. Miller, jr., curator of mammals, deeply interested in the extinct mammals of the island, visited this area at his own expense in February and March, 1928, accompanied by Mrs. Miller. As the excavations to be made were also of great archeological interest, Mr. H. W. Krieger, as already stated, was detailed to conduct that phase of the work through funds provided by Dr. W. L. Abbott. These joint investigations proved of great importance as there were obtained through them extensive series of bones of mammals and certain birds long extinct, from which there will come fuller understanding of their form and structure. The work was continued at the mouth of the Rio San Juan and at Anadel on the Samana Peninsula, resulting in additional osteological specimens of importance. The material obtained is now being studied.

Through the further interest of Dr. W. L. Abbott, Mr. Arthur J. Poole, of the division of mammals, was occupied from December 8, 1927, to March 21, 1928, in a thorough exploration of the well-known caves near San Michel, Haiti, obtaining large collections of bones of the extinct animals which occur in these deposits. It was particularly important that these specimens be collected at this time, since the earth on the cave floors was being removed for use as fertilizer, and in a short time all material of scientific value would have been destroyed. As incidental to this work Mr. Poole secured considerable collections of herpetological material and other zoological specimens. Reconnaissance of other caverns may indicate desirability of further work in these deposits from which many bones of mammals and birds have been obtained.

Mr. W. L. Brown, of the taxidermist staff of the Museum, was detailed to accompany an expedition to the Sudan organized by Mr. William N. Beach to secure large mammals. The original party consisted of Mr. and Mrs. Beach, Mr. Marcus Daly, and Mr. Osgood Field. Sailing from Hoboken on January 4 on the S. S. *George Washington*, Mr. Brown and Mr. Field proceeded to Cherbourg, France, and from there continued by rail to Marseilles, where they joined the rest of the party and took steamer to Port Sudan, continuing from there by train to Khartoum. In a chartered boat, the *Lord*

Cromer, they navigated as far as Malakal, about 50 miles up the White Nile, where the sudden illness of Mr. Beach made it necessary to return to Khartoum and prevented his continuing with the party. The others proceeded, working the territory between Khartoum and Rejaf. During 20 days in the field Mr. Daly, Mr. Field, and Mr. Brown collected many scientific specimens, as well as material for an exhibition group of gazelles, with all necessary accessories of earth, ant hills, thorn bushes, and other vegetation. Apart from the specimens obtained for the Museum collections, Mr. Brown observed in a wild state, elephants, lions, antelopes, hippos, wart hogs, buffaloes, giraffes, zebras, several cats, monkeys, crocodiles, and birds of many varieties, including the shoe-bill stork—experience of great profit to a taxidermist. He returned to Washington in April. The collections brought home included 49 mammals, 83 bird skins, 103 alcoholic birds and skeletons, and a large number of reptiles and fishes.

In November, 1927, following a stay in this country, Dr. Hugh M. Smith, director of fisheries of Siam and associate curator in zoology of the National Museum, returned to Bangkok, where he resumed active collecting of zoological materials. Word has already come of large gatherings of specimens.

In spite of the political situation in China, Mr. A. de C. Sowerby, under the auspices of Col. R. S. Clark, continued his researches and collecting. A large consignment of reptiles, fishes, and marine invertebrates has come from him during the year.

Dr. D. C. Graham, who has forwarded such splendid collections from western Szechuan, China, returned in the late fall of 1927 to Suifu, where he began at once his zoological studies. The first fruits of his endeavors have been received and include interesting collections of birds, reptiles, and invertebrates.

Dr. J. M. Aldrich, associate curator of insects, who at his own expense was in the field at the end of June, 1927, continued entomological collecting during the months of July and August at various points in the West, eastern Nevada, the higher parts of the Sierra Nevada in California, and the Yellowstone Park, which proved to be localities of greatest interest. While the principal object of his work was the collecting of Diptera, valuable material in other orders of insects was secured.

Mr. James O. Maloney, aide in the division of marine invertebrates, while on a vacation tour at his own expense, secured many valuable specimens of terrestrial isopods in Virginia, Tennessee, Alabama, and Mississippi.

At the invitation of Mr. Copley Amory, of Washington, D. C., Mr. and Mrs. Paul Bowman of George Washington University, and

Doctor Bartsch, curator of mollusks, proceeded in June, 1927, to Mr. Amory's summer home on Matamek River on the north shore of the Gulf of St. Lawrence, where Doctor Bartsch initiated plans for a study of the local flora and fauna which were continued by Mr. and Mrs. Bowman until September. Mr. Amory placed a laboratory provided with the needed equipment for research and other facilities at the disposal of the party, and was ever ready to give the benefit of his knowledge of local conditions acquired through many years of residence, as well as personal help. In addition to marine dredging, careful collecting was done along the beaches, in the shallow lagoons and tide pools, and in the inland pools, lakes, and streams of the region for fresh-water organisms. Collections were secured of the ectoparasites and endoparasites of fishes and careful analyses of the stomach contents of fishes were made. Mr. Bowman devoted time to the plants, covering all groups from marine and fresh-water algae to the flowering groups. Serial cores of the peat bogs were taken and the samples shipped to Washington for microscopic study. A large amount of material, both animals and plants, was collected which is to be worked up later.

In continuation of Cerion studies mentioned in previous reports, Doctor Bartsch visited the laboratory of the Carnegie Institution at the Tortugas from August 16 to 27, 1927. The year had been an unusually dry one at the Tortugas, affecting adversely some of the groups of Cerions under observation. Visits were made to all the colonies of Cerions in the Tortugas, and material collected for study in Washington. A series of specimens of *Cerion viaregis* from the Tortugas and *Cerion incanum* from Key West, and of a hybrid Cerion from Newfound Harbor Key, were gathered and sent to Prof. Edward C. Jeffrey, Harvard University, for a comparative study of their chromosomes.

Botanical field work during the year 1927–28 has been conducted in Honduras by Mr. Paul C. Standley, associate curator; in the islands of Formosa and Sumatra by Prof. H. H. Bartlett, collaborator; in Texas by the late Dr. J. N. Rose, associate curator; in Oregon and Washington by Dr. A. S. Hitchcock, custodian of grasses; and in California by Mr. J. R. Swallen, assistant in the grass herbarium. Mr. Standley's botanical exploration in Honduras was made possible by the generous cooperation of Prof. Oakes Ames, of Harvard University, and the United Fruit Co. Work began in December and was conducted from headquarters at Tela, being mainly confined to the lowlands and adjacent low mountains along the north coast. During four months upward of 9,000 specimens were collected, these representing the largest single botanical collection ever procured in Honduras. The material is of unusual interest, since it contains many

new specimens and others not known previously from that region. Professor Bartlett's field work in Formosa and Sumatra, financed from personal funds, was conducted under the joint auspices of the National Museum and the University of Michigan. The period of exploration in Formosa, though short, yielded specimens of many endemic species, chiefly from the higher mountains, which were not previously represented in American herbaria. In Sumatra the field work was continued from December, 1926, to the middle of July, 1927, and resulted in the accumulation of a large collection consisting of about 2,400 numbers, mostly represented by 5 to 10 specimens each. The exploration included the ascent of several volcanoes and lesser mountains and a reconnaissance of the Asahan region. The importance of this collection can scarcely be overestimated in view of the rapid destruction of the Sumatran jungle, whose components are still very imperfectly known.

In connection with current investigations of native plants as potential sources of rubber, the late Dr. J. N. Rose, associate curator of plants, was detailed to field work in Texas during October and November, 1927, through funds supplied by Mr. Thomas A. Edison. From the economic standpoint the results were chiefly negative, but a considerable collection of herbarium material was obtained for use in other current studies, chiefly an investigation of the families Caesalpinaceae and Mimosaceae. In this work Doctor Rose was accompanied by Mr. Paul G. Russell, on detail from the Bureau of Plant Industry.

Field studies of grasses for the United States Department of Agriculture were conducted during the summer of 1927 in the Pacific coast region of the United States by Dr. A. S. Hitchcock, custodian of the section of grasses, and Mr. J. R. Swallen, assistant in the grass herbarium. Doctor Hitchcock spent about 10 weeks in the mountains of Oregon and Washington, in cooperation with the Forest Service, and a similar period was spent in California by Mr. Swallen. In both cases the object of the investigation was to determine the amount and character of variation in the grass species due to environmental and other factors, and to discover differential characters for the various species. Excellent collections of illustrative material were obtained. At the present time Mr. Swallen is absent on a similar field trip in the southwestern United States.

Under an allotment from the Roebling fund, Dr. W. F. Foshag visited several mineral localities in the State of Sonora, Mexico. The chief point of interest was the Chispas mine, near Arispe, where Doctor Foshag procured a series of the magnificent silver minerals found there. During several days spent at Bisbee, Ariz., in collecting minerals and examining material offered for sale, some very interesting specimens were added to the collections. In cooperation with the

mineralogical museum of Harvard University, and accompanied by a representative of that institution, Doctor Foshag spent three months collecting minerals and examining mineral deposits in the States of Guanajuato, Zacatecas, Durango, and Chihuahua, Mexico. A considerable amount of excellent exhibition and study material was obtained, including groups of large gypsum crystals, a fine series of lead and zinc minerals, and complete sets of ores and rocks from all of the important mining districts visited. These will be used as the basis of a report on these districts.

Drs. C. E. Resser and R. S. Bassler spent two months in the Rocky Mountain region in a reexamination of certain Canadian sections for stratigraphic details necessary for the completion of Doctor Walcott's unfinished manuscript summarizing the knowledge gained in his years of extensive research. The area examined was covered by motor and the researches were at various times greatly facilitated by the cooperation of other geologists familiar with local sections. The territory covered included the Wasatch Mountains, Yellowstone National Park and the mountains immediately north, and the area along Newland Creek, Meagher County, Mont. Stops were also made in the Little Belt Mountains. The main objective of the summer's work, however, was the general region of the Bow Valley, Canadian Rocky Mountains, north and west of Banff, Alberta, and certain other localities well known from Doctor Walcott's investigations.

In cooperation with the Milwaukee Public Museum, Dr. Erwin Pohl continued a detailed study of the little known but highly important stratigraphy of the Middle Paleozoic of the mid-Eastern and Central States. The researches of the season covered portions of eastern Wisconsin, southern Michigan, northern Ohio, and southern Ontario. Nearly 2 tons of selected and beautifully preserved fossils resulted from the trip.

Dr. Joseph A. Cushman, collaborator in paleontology, spent the greater part of the summer of 1927 in a field trip through various countries of western Europe primarily to secure collections of fossil foraminifera from classic areas. He was highly successful in his work, and as a result, large numbers of types will come to the Museum upon the completion of his studies.

Late in the fiscal year Mr. Gilmore was detailed for an expedition in the Two Medicine formation in Montana to search for dinosaur and other vertebrate remains, with Mr. George F. Sternberg, who has had long and varied experience in fossil collecting, as his assistant. Incomplete reports to date indicate the finding of valuable material. As the expedition will continue into the next fiscal year, a detailed report will be given later.

Exploratory work in the Pleistocene was again taken up by Dr. J. W. Gidley at Melbourne and other localities in Florida. The

expedition, which covered a little more than two months, was made possible through the generosity of Mr. Childs Frick, who furnished half of the funds necessary for carrying on the work, the remainder coming from the Smithsonian Institution. Doctor Gidley was assisted by Mr. C. P. Singleton, of Melbourne. Two principal problems involved in this research included the further search for evidence on the contemporaneity of man with an extinct fauna in Florida, a much-disputed question, and the collection of additional material for the purpose of fixing more definitely the age of this fauna. The results in both cases are regarded as highly satisfactory.

BUILDINGS AND EQUIPMENT

Minor repairs of various kinds have been required to keep the buildings housing the Museum in proper condition during the year. In the Natural History Building, woodwork of windows on the ground and third floors was repainted, and the interior woodwork on windows on the third floor was refinished. The ceiling and walls in the bird range were pointed up and painted, and wooden floors in rooms occupied by the division of mammals and the Biological Survey and in the office of the assistant secretary were refinished. Tin-lined gutters on the roofs were given a coat of metallic and oil paint; broken glass in various windows was replaced; wooden ladders were installed for use in inspecting the walls supporting the dome on the attic floor, and down pipes leading from the roof were repaired.

In the Arts and Industries Building metal roofs were repainted, ventilating windows were repaired and provided with screens, and wooden window frames and sash recoated with lead and oil paint. The southwest range was repainted, as well as the gallery, and an iron-pipe railing installed on the latter to replace a temporary guard rail formerly in use. The composition floor of the reading room in the library was covered with cork carpet. A wire screen partition was built on the third floor of the northeast pavilion to prevent unauthorized persons from entering the Mechanical Technology Laboratory; a concrete floor was laid about the mine exhibit in the southwest pavilion; and sheet-iron hoods were made for radiators in the Lace Hall to protect the walls from accumulation of dirt.

In the Smithsonian Building a hot-water system was installed; stairs leading to the comfort rooms were repaired; the doors in the disbursing agent's office were remodeled; the east entrance vestibule was repaired and painted; and doors in the storage room were made fireproof by covering with sheet iron.

The exterior of the Aircraft Building was repainted and broken glass replaced.

The work of replacement of the main portion of the concrete service road east of the Natural History Building was continued, 180½ linear feet being laid during the year.

The power plant was in operation from September 21, 1927, until May 29, 1928. The consumption of coal was 3,416 tons, an amount in excess of that used in 1927. The average cost of coal was somewhat greater than for the preceding year, being $5.87 per ton. The Steamboat Inspection Service of the United States examined the boilers during the summer and reported them in good condition, stating that they complied with all regulations governing steam boilers of this type. The elevators have been regularly inspected by the District of Columbia inspector, and are now equipped with all necessary safeguards to protect passengers. The total electric current produced amounted to 603,343 kilowatt-hours, manufactured at a cost of 1.89 cents per kilowatt-hour, including interest on the plant, depreciation, labor, and material. The engineer reports a decided increase in efficiency in the production of electric current, due to installation of new pistons in the operating engines, an essential increase, as the demands for light and power from all the buildings grow larger each year. The ice plant manufactured 354.3 tons of ice at an average cost of $2.41½ per ton, which is slightly less than the cost for the previous year.

During the year 23 exhibition cases and bases, 226 pieces of storage, laboratory, and office furniture, and 2,178 drawers of various kinds were added, practically all of these being manufactured in our shops.

MEETINGS AND RECEPTIONS

The lecture rooms and auditorium of the National Museum during the present year were used for 115 meetings, which covered a wide range of activities. Governmental agencies that utilized these resources for hearings, meetings, lectures, and exhibitions of pictures included the Commission of Fine Arts, the Graduate School of the United States Department of Agriculture, the Federal Horticultural Board, the Forest Service, the Federal Radio Commission, the Bureau of Plant Industry, and the Extension Service of the United States Department of Agriculture.

Members of the Forest Service held a series of meetings during the year dealing with various phases of their work. The Smithsonian staff was convened on February 17, 1928, for an address with motion pictures by Mr. Matthew W. Stirling on his expedition to New Guinea, which was carried on in cooperation with the Smithsonian Institution.

Scientific societies that met regularly in the building included the Entomological Society of Washington, the Society for Philosophical

Inquiry, the Anthropological Society of Washington, the American Horticultural Society, and the Wild Flower Preservation Society. Meetings were held also by the American Society of Mechanical Engineers, aeronautic division: the Washington Society of Engineers; the Potomac Garden Club: the Washington Society of Fine Arts; the Washington Academy of Sciences; the Seymour Club; the District of Columbia Federation of Music Clubs; the District of Columbia Library Association; the American Surgical Association: and the American Association for Thoracic Surgery.

The American Ornithologists' Union was convened for its annual meeting from November 15 to 17, inclusive. The American Society of Mammalogists held its annual meeting from April 11 to 13, and the annual meeting of the American Society of Ichthyologists and Herpetologists was convened on April 16.

The World Unity Foundation held a meeting on February 21 for addresses by Herbert Adams Gibbons, of Princeton University, and Felix Valyi, of Geneva, Switzerland. The Masonic Clubs of the District of Columbia met on February 22, under Gen. Amos A. Fries, for an address by Judge James W. Witten. The American War Mothers, District of Columbia Chapter, met on April 27 for addresses by Representative Royal C. Johnson, of South Dakota, and Gen. Amos A. Fries. Music was furnished by the United States Marine Band.

The Fifth National Oratorial Contest was held in the auditorium on May 10. The Fourth Annual National Spelling Bee came on May 22, with 25 boys and girls entered for the contest. The first prize was won by Miss Betty Robinson, representing the South Bend News-Times.

The Veterans of Foreign Wars of the United States, Federal Post, No. 821, United States Department of Agriculture, met on May 28 for addresses by R. W. Dunlap, Assistant Secretary, United States Department of Agriculture, and Maj. Gen. Charles P. Summerall, United States Army. Music was furnished by the Navy Band.

Other agencies using the auditorium or lecture room included the Washington Times, the National Association of Retired Federal Employees, classes from George Washington University and Howard University, the Boy Scouts, groups from the public schools of the District of Columbia, and the Smithsonian Relief Association.

On January 24, 1928, at 11 a. m., there was held a special memorial meeting under direction of the Board of Regents of the Smithsonian Institution to commemorate the life and work of Charles Doolittle Walcott, fourth Secretary of the Smithsonian Institution. The gathering was presided over by the chancellor of the Institution, the Hon. William Howard Taft, Chief Justice of the United States. Addresses were delivered by Dr. John C. Merriam, representing the

Carnegie Institution of Washington; Dr. Joseph S. Ames, for the National Advisory Committee for Aeronautics; Dr. George Otis Smith, for the United States Geological Survey; and Dr. Charles G. Abbot, for the National Academy of Sciences and the Smithsonian Institution.

Special exhibitions in connection with various meetings included an historical exhibit dealing with ornithology arranged in connection with the convention of the American Ornithologists' Union during November, and one concerned with the work of American artists portraying mammals in connection with the annual meeting of the American Society of Mammalogists from April 1 to 15.

On the evening of February 28 members of the Geological Society of Washington were given a special view of the geological collections in the National Museum. From March 1 to 3 there was a special display of the work in nature study in the fourth to the eighth grades in the District of Columbia schools arranged under Miss Esther W. Scott, teacher of elementary science.

On June 21 there was a special meeting in the Arts and Industries Building of a group of 100 persons representing the Chamber of Commerce of St. Louis and other backers of the Lindbergh flight, who assembled for a ceremony beneath Colonel Lindbergh's plane, the *Spirit of St. Louis*, when a silver medal commemorating the first New York-to-Paris flight was presented to the Smithsonian Institution. The Secretary responded with a brief address, in which he expressed the thanks of the Institution to those closest to Colonel Lindbergh in his great venture for the privilege of exhibiting the plane in the Museum halls.

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 opened Sunday afternoons from 1.30 to 4.30. From January 22 to the close of the year the exhibits in the Smithsonian Building were also opened to the public on Sunday afternoon for the hours indicated. All buildings were closed on Christmas Day and New Year's Day.

Visitors to the Museum during the year totaled 1,413,386 persons, an increase of more than 260,000 over the previous year, an excellent index to the number of Americans who come to visit the National Capital. Attendance in the several buildings was recorded as follows: Smithsonian, 175,190; Arts and Industries, 517,238; Natural History, 618,773; Aircraft, 102,185.

The average daily attendance for week days was 3,901 and for Sundays 3,761. The public has shown great appreciation of the privilege of entrance to our exhibits on Sunday afternoons.

During the year the Museum published 10 volumes and 59 separate papers, while the distribution of literature amounted to 111,405 copies of its various books and pamphlets.

Additions to the Museum library have included 3,015 volumes and 1,165 pamphlets, obtained partly by exchange and partly by donation. The library of the National Museum, as separate from that of the Smithsonian Institution proper, has now 72,315 volumes and 106,881 pamphlets. Though most of the accessions for the present year, as usual, came through an exchange of publications, there may be noted the donation of 595 volumes and many additional separate papers from the American Association for the Advancement of Science, among them many works now out of print and very rare, which have served to complete a number of important sets on our shelves. Mr. William K. Vanderbilt presented a copy of his privately printed work entitled "To Galapagos on the *Ara*." Mr. Thomas A. McCaslin presented a bound manuscript entitled "A Souvenir of Wyoming," including a diary of a trip in Jackson Hole and Yellowstone Park, with many remarks on early history and historical geography. The Librarian of Congress transferred 68 volumes and 47 parts to supplement our reference works, and about 300 volumes, chiefly on the religions of the Old World, were received from the estate of Dr. I. M. Casanowicz, late assistant curator of the division of Old World archeology. During the year the library staff completed the sorting of a large accumulation of reprints, which were placed in the hands of the curators to whose work they were most related. A number of special collections of books, including the Casey, Dall, Gill, Henderson, Lacoe, Roebling, Schaus, Springer, and Teller libraries were listed in preparation for cataloguing.

Dr. Samuel W. Woodhouse, for some time associated with the Institution in connection with the art collections presented to the National Gallery of Art by the late Alfred Duane Pell, was given honorary appointment as collaborator in ceramics. Mr. Robert A. Cushman, of the Bureau of Entomology, United States Department of Agriculture, was made assistant custodian of hymenoptera. Mr. Arthur Cleveland Bent, of Taunton, Mass., well known for his comprehensive volumes on the life histories of North American birds, was appointed collaborator in the division of birds. Dr. Joseph A. Cushman, an international authority on foraminifera, was appointed collaborator in foraminifera in the division of marine invertebrates. Dr. W. T. Schaller was given honorary appointment as associate in mineralogy in the department of geology.

Mr. Ellsworth P. Killip, aide in the division of plants, was advanced on December 1 to assistant curator and, following the resignation of Mr. Paul C. Standley on May 31, to associate curator. On June 1 Mr. Emery C. Leonard was made assistant curator in the division of plants. Miss M. F. Willoughby was appointed senior clerk in the division of stratigraphic paleontology on December 16. The division of Old World archeology, following the death of Dr. Casanowicz, has been placed temporarily under the general supervision of Mr. Neil M. Judd, curator of American archeology.

Turnover on the staff for the year was less than for the similar preceding fiscal period, due to the action of Congress in making possible on July 1, 1927, the first promotions under the efficiency ratings. The Museum force has now become more stabilized, with resultant improvement in morale.

Three employees left the service through the operation of the retirement act: Columbus M. Sorrels, watchman, after 36 years' service; Robert Campbell, a laborer at the Museum for 33 years; and Thomas Hamilton, laborer, after 23 years of service.

Miss Elizabeth Ward Lamon, principal clerk-stenographer in the administrative office, after a Government service of 30 years, was granted an indefinite furlough to permit her to regain lost health.

The Museum lost through death a number of important members of its scientific staff, all of whom had been long associated with its scientific work. Dr. Immanuel Moses Casanowicz, assistant curator of Old World archeology, died September 26, 1927. Dr. Joseph Nelson Rose, assistant curator of plants, died May 4, 1928. Mr. Bradshaw Hall Swales, honorary assistant curator of birds, died on January 23, 1928. Other losses by death included Mr. Joseph Mace, who served the Museum as teamster for over 50 years; Bernard W. Burdine, oiler, with 40 years of service; Samuel J. Lancaster, watchman, with 33 years of service; Carter E. Collins, laborer for 30 years; Edwin J. Weiskoff, electrician for 17 years; Edgar Furbush, watchman for 6 years; and Frank Nash, laborer for 2 years.

Respectfully submitted.

ALEXANDER WETMORE,
Assistant Secretary.

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

APPENDIX 2

REPORT OF 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 fiscal year ending June 30, 1928:

The urgent need of a national gallery building has been a chief concern of the gallery staff and of the commission during the year. The poverty of space for the installation of collections already in hand and for the encouragement of gifts and bequests of art works, the sources of our present riches, has interfered seriously with progress in any direction. It is to be hoped that this condition may soon be remedied. Upward of a year ago it was announced in the public press that, under certain suggested conditions, private funds would become available for the erection of a building. There is naturally less inclination in Congress to consider grants for art while the prospect of private munificence for this purpose is thus definitely foreshadowed. Moreover, the project of a great group of buildings, manifestly necessary to the public welfare and requiring vast expenditure of the public funds, took shape about this time and is now being carried forward with commendable vigor. It is thus apparent that for the present the realization of the gallery's hopes seems dependent on the generous response of public-spirited citizens to a manifest need. Undue delay in the struggle for national art appears as a great misfortune, since we are compelled to remain inactive during a period of exceptional art activity and art production and distribution, and in which the art treasures of the Old World are in a state of unparalleled flux.

THE GALLERY COMMISSION

The art collections of the Institution, which accumulated slowly during the last quarter of a century, and largely within the department of anthropology of the National Museum, had, in 1920, grown so in bulk that the Regents of the Institution found it advisable to establish the National Gallery as a separate bureau of the Institution, and a commission was appointed to consider its interests and promote its welfare. This commission comprises 16 members—5 public men

interested in the fine arts, 5 experts in the fine arts, and 5 artists, the Secretary of the Institution becoming a member ex officio. The membership at present is as follows: W. K. Bixby, Joseph H. Gest, Charles Moore, James Parmelee, Herbert L. Pratt, John E. Lodge, Frank Jewett Mather, jr., Charles L. Borie, jr., Edward Willis Redfield, James E. Fraser, Edmund C. Tarbell, Daniel Chester French, Herbert Adams, Gari Melchers, William H. Holmes, and C. G. Abbot, ex officio.

The Regents' plan provided for two or more meetings of the commission per year, but it was soon found that a single meeting only was necessary to look after the affairs and to consider the problems of the gallery. Meetings were held annually beginning in 1921, and their proceedings are recorded in the annual reports of the Smithsonian Institution.

The seventh annual meeting of the commission was held in the Regents' room of the Institution on December 6, 1927. The members present were Gari Melchers, chairman; Frank J. Mather, jr., vice chairman; W. H. Holmes, secretary; Herbert Adams; James E. Fraser; John E. Lodge; James Parmelee; E. W. Redfield; and C. G. Abbot, Acting Secretary of the Smithsonian Institution.

The annual report of the secretary of the commission reviewing the activities of the gallery for the calendar year 1927 was then presented. There was wide discussion of various matters treated in the report, especially (1) the question of the development of a national portrait gallery as a separately conducted branch of the gallery proper, and (2) the possible assemblage in the gallery at a future date of the Ranger-fund purchases now tentatively held by various galleries throughout the country, the National Gallery having the privilege of claiming such of these works, now numbering upwards of 60, as it may choose, after the lapse of a certain period. The purpose of the proposed assemblage is to enable the commission to keep in touch with the growing collection and to make tentative selection of such works as appear worthy of a place in the National Gallery. On motion of Mr. Adams, it was resolved that in the sense of the meeting it is desirable to hold such an exhibit of the Ranger purchases. On motion, it was further resolved that the Secretary of the Smithsonian Institution be invited to ask the Bureau of the Budget to recommend an appropriation of $1,000 to meet the expenses of the proposed exhibition of the Ranger paintings.

The secretary presented a request of the National Press Club of Washington for the loan of gallery paintings for the embellishment of the club's reception rooms and principal offices, and after discussion, on motion of Mr. Mather, it was *Resolved:* That it is the policy of the National Gallery of Art not to lend works of art of public ownership to private institutions.

Following adjournment at noon the advisory committee visited the gallery rooms in the National Museum Building to consider acceptance of offerings of art works for the year. The following were accepted: (1) Seven water-color paintings of Greek Temples, by Henry Bacon, designed to serve as a nucleus for a prospective architectural department in the gallery; (2) a three-quarters length portrait of Admiral Samuel Francis Du Pont, by Daniel Huntington, for the National Portrait Gallery; and (3) portrait busts of Gen. Winfield Scott and William Cullen Bryant, by Henry Kirke Brown, for the Portrait Gallery.

THE HENRY WARD RANGER FUND PURCHASES

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, which are under certain conditions prospective additions to the gallery collections, are as follows, including the names of the institutions to which they have been assigned:

Title	Artist	Date of purchase	Assignment
63. Cypripedia	Sergeant Kendall, N. A.	December, 1927	
64. The Chief's Canoe	Belmore Browne	do	National Gallery of Art, Washington, D. C.
65. Feeding Cattle, Winter	Harry Leith-Ross	do	Montana State College, University of Montana, Bozeman, Mont.
66. Ice Pond	Aldro T. Hibbard, A. N. A.	do	Phillips Andover Academy, Andover, Mass.
67. A Long Island Garden	Childe Hassam, N. A.	do	The Kansas City Art Institute, Kansas City, Mo.
68. Mlle. Maria Safanoff	Irving R. Wiles, N. A.	April, 1928	

THE ALFRED DUANE PELL COLLECTION

Thirty-six pieces of porcelain were added to the Alfred Duane Pell collection, already installed, by Mrs. Pell, Mr. Pell having died March 6, 1924. The lot includes 10 superb pieces of pate-sur-pate by Solon and 4 by his pupil, A. Birks; 6 pieces of charming Old Worcester ware: 1 piece of the hitherto unrepresented New Hall porcelain; 1 piece of Meissen from a set made for the King of Holland; and examples of Capo di Monti, Doccia, and other Italian porcelains. The pieces by Solon are of special interest in rounding out the gallery's exceptional representation of this great master's work.

THE GEORGE DUPONT PRATT GIFT

The Thomas Moran painting of the Grand Canyon of the Yellowstone which has been exhibited in the gallery for a number of years

as a loan, first by the artist and later by his daughter, Miss Ruth B. Moran, has been added to the gallery's permanent collections. In May of the present year during a visit of Mr. Pratt to the gallery he became deeply impressed with the national importance of this great work, and soon after announced his willingness to contribute $10,000 to its purchase. Miss Moran was so greatly pleased with the prospect of having the picture become the property of the Nation, thus retaining its place in the National Gallery, that she decided to accept this amount. Moran may well be regarded as our greatest master of landscape, marvelously skilled with the pencil, the graver, and the brush, and he was a colorist unsurpassed. After three visits to the Yellowstone he chose this as the subject most worthy of his crowning effort, and prepared the way for its realization by a multitude of studies in pencil and water color. The canvas finally chosen was so large—8 by 14 feet—that it could not be accommodated in his East Hampton studio and a near-by carpenter shop was utilized for the purpose. The acquirement of this work is a triumph for the National Gallery.

SPECIAL EXHIBITS HELD IN THE GALLERY

With the opening of the calendar year 1928 the gallery entered upon a period of exceptional activity. Four important exhibits followed one another in quick succession. The space required for their installation was obtained by removing to storage the contents of four of the main exhibition rooms of the gallery. This was made less embarrassing by the withdrawal at the particular moment of the McFadden collection of British old masters, which had occupied two of the rooms for a number of years awaiting the completion of the Philadelphia Museum of Art, in which institution they are destined to find a permanent resting place.

THE ÖSTERMAN COLLECTION

It happened also at this time that the Henry Cleveland Perkins collection of British and Dutch masters, exhibited for several years in the northeast room of the gallery, was withdrawn, and in this room the first of the series of exhibits, the remarkable collection of portraits with one figure subject, by Bernhard Österman, of Stockholm, Sweden, was installed. This exhibit, held under the patronage of His Excellency, W. Boström, the Swedish minister in Washington, was opened to the public January 11, a private view by special invitation having been given on the 10th. An illustrated catalogue was supplied by the artist, the foreword to which, by Christian Brinton, is in part appropriately quoted in this place.

The present exhibition offers a comprehensive résumé of Mr. Bernhard Österman's work. From the early likeness of the ascetic, intellectual Bishop of Lund to the latest products of his brush you observe an increased mastery of the approved elements of pictorial representation. For aristocratic restraint, coupled with clearly realized individuality, special mention must be made of the seated figure of His Majesty the King of Sweden. In sheer vigor of characterization the standing three-quarter length of Herr von Stubenrauch, late president of the Berlin police, occupies a position by itself in the artist's gallery of international celebrities.

It happened that this collection at the close of the exhibition, January 24, was not scheduled for exhibition elsewhere for the remainder of the season and the artist consented to have it remain on view in the gallery until the next exhibition season opens.

ANNUAL EXHIBITION OF THE SOCIETY OF WASHINGTON ARTISTS

Early in 1928 it became known that the Corcoran Gallery, due to the erection of the W. A. Clark Annex and the installation of his great collection, could not hold the accustomed annual exhibits of the local art societies. A plea was made by the artists, who were at a loss for accommodations, to the director of the National Gallery who was glad to grant the request, although the granting implied a very great crowding of the season's exhibits. The annual exhibition of the Society of Washington Artists followed the Österman exhibit and was opened to the public February 4. The society printed its usual catalogue, which listed 119 paintings and 11 works of sculpture. The installation in the three available halls of the gallery proved highly satisfactory to the society and the exhibit met with marked public appreciation.

COLLECTION OF CONTEMPORARY BRITISH ART

The exhibit of the local society was followed by a most interesting collection of paintings, 91 in number, by contemporary British artists, which remained on view from March 5 through April 1. The paintings were assembled in London by Miss Charlotte Pearson with the approval of the president of the Royal Academy, who named as an honorary committee the Earl of Balfour, K. G., the Earl of Birkenhead, K. G., Sir Frederic G. Kenyon, G. B. E., and His Excellency the Hon. Alanson B. Houghton, ambassador of the United States to Great Britain. The committee of selection was composed of Robert Anning Bell, R. A., Sir D. Y. Cameron, R. A., Sir George Clausen, R. A., Julius Olsson, R. A., and Miss Charlotte Pearson, secretary, who accompanied the collection to Washington, and at the close of its presentation here directed its transfer to the Toronto Art Gallery, Toronto, Ontario, Canada.

The exhibit was held under the patronage of His Excellency Sir Esme Howard, G. C. M. G., the British ambassador to the United

States, and was opened by a public reception tendered by the Board of Regents of the Institution. The foreword of the catalogue, by Sir Frederic G. Kenyon, G. B. E., was introduced by the following lines:

> The object of the present exhibition is to bring to the notice of the American people some part of the contemporary work of the artists of Great Britain. It has the support of many of its leading painters, and it is believed that it may fairly claim to be representative of much of the best work that is being done there to-day. Merely as an exhibition of art it is hoped that it has attractiveness and merit.

ANNUAL EXHIBITION OF THE WASHINGTON WATER COLOR CLUB

The annual exhibition of the Washington Water Color Club followed the British exhibit and closed the loan exhibition program for the season. There were 226 exhibits—185 in water colors and 41 etchings, block prints, and drawings. The result in this case, as in that of the local oil exhibit, was highly satisfactory. The works were well shown and the attendance was gratifying.

It may be stated in this place that it is not a definitely authorized privilege of the gallery, which is a Government bureau, to entertain displays for individuals or private organizations of which an essential feature is the privilege of making sales. The admission of the exhibits of the two local societies was, as stated above, due to a serious emergency that had arisen, and no objection has been raised.

THE JOHN ROSS KEY COLLECTION OF PAINTINGS

In January, 1927, the gallery accepted for temporary exhibition a large collection of paintings by John Ross Key, mainly landscapes of the near-by States but including a number of interesting canvases representing colonial mansions of Washington and near-by Maryland and Virginia. These latter paintings have much sentimental interest aside from the subjects represented, being the handiwork of the grandson of Francis Scott Key, the author of our Star-Spangled Banner. At the close of the exhibition the owner, Mrs. Ellenore Dutcher Key, was permitted to continue the exhibition for several months beyond the stipulated period, and the collection is still held in reserve at the close of the fiscal year 1928.

REINSTALLATION OF COLLECTIONS

At the close of the loan exhibition season in July, reinstallation of the gallery collections, largely in storage, was taken up and given very careful attention, so that the appearance of the gallery to-day is more satisfactory and the collections more fully representative than

at any previous period. Paintings of the highest order of merit were chosen, and overcrowding was avoided. Many works are, however, held in reserve, but all of these are hung where they may be seen to advantage by visitors desiring to examine them.

LABELING OF COLLECTIONS

Upward of 100 metal labels have been engraved and attached to the frames of the paintings to which they belong. Aside from these labels, all necessarily of small size, and limited to the simplest essentials of record, framed labels giving fuller data are attached to the background in close proximity to the pictures.

CARE OF COLLECTIONS

Requisite care has been given to all paintings with respect to repair, restoration, varnishing, and glazing, there remaining unglazed only four works which are of such large size that glass can not be introduced. Three paintings requiring expert treatment, Man Wearing a Large Hat, by Rembrandt; portraits of Lord Abercorn, by Lawrence, and of Viscount Hill, by Reynolds, were intrusted to the expert restorer of old masters, Mr. H. E. Thompson, of the Boston Museum of Fine Arts, and have been returned to the gallery in an entirely satisfactory state.

ART WORKS RECEIVED DURING THE 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:

Portrait of Admiral Samuel Francis Du Pont (1803–1865) by Daniel Huntington, P. N. A. (1816–1906); bequest of Mrs. May Du Pont Saulsbury, for the National Portrait Gallery.

A painting entitled "Grand Canyon of the Yellowstone," by Thomas Moran, N. A. (1837–1926); gift of Mr. George Dupont Pratt, of New York City.

A painting by Belmore Browne (1880–), entitled "The Chief's Canoe," purchased from the Henry Ward Ranger fund by the council of the National Academy of Design, trustees of the fund, and assigned to the gallery.

Thirty-six pieces of porcelain including pate-sur-pate by Solon and his pupil, A. Birks; Old Worcester ware; Hall porcelain; Meissen; and Capo di Monto, Doccia, and other Italian porcelains. Gift of Mrs. Alfred Duane Pell as an addition to the Alfred Duane Pell collection.

Miniature painting of Mrs. Harriet Lane Johnston by John Henry Brown (1818–1891); bequest of Miss May S. Kennedy, cousin of Mrs. Johnston, as an addition to the Harriet Lane Johnston collection, "said painting (according to the terms of acceptance) * * * to be placed in the case beside the miniature of President Buchanan and there permanently exhibited, and in case it shall not be so exhibited, it shall revert to the members of the family of May S. Kennedy, in accordance with the terms of her said will."

Thirteen specimens of modern Japanese cloisonné, and a series of nine small vases illustrating the stages of manufacture, with the tools and materials used in the manufacture of cloisonné, all by Yoshichika, of Tokyo, Japan; presented by Seth B., jr., and Thomas Dudley Robinson, of New York City.

Medallion portrait in bronze of Dr. Charles W. Elliot, by W. Clark Noble; gift of the sculptor.

A painting, entitled "The Abbess," by Govaert Camphuysen (1624–1674); bequest of Mrs. Emily H. Edrington.

LOANS ACCEPTED BY THE GALLERY

Portrait of Lady Evelyn Cook, by John Hoppner, N. A. (1758–1810); let by Mrs. Arthur Lee, of Washington, D. C.

A painting entitled "A Farnese Investiture," attributed to Titian (1477–1576); lent by Mrs. Estelle Bakewell-Green, Norwood, Pa.

A painting entitled "The Immaculate Conception with the Mirror," by Bartolomé Estéban Murillo (1617–1682); lent by Mr. De Witt V. Hutchins, Riverside, Calif.

Portraits of Fisher Ames, by Gilbert Stuart, and Alexander Hamilton, by John Trumbull; lent by Mr. George Cabot Lodge, of Washington, D. C.

A painting entitled "The Lido, Venice," by H. Corrodi, Rome (1844–1905); lent by Mr. Arthur T. Brice.

Portrait of Dr. Charles G. Abbot, Secretary of the Smithsonian Institution, 1928– , by S. L. Huntley; lent by Doctor Abbot.

Portrait of Henry, Prince of Wales (or Prince Charles), by C. Janssens van Ceulen (1664); lent by Mr. and Mrs. Marshall Langhorne, Washington, D. C.

DISTRIBUTIONS

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

Portrait of Thomas Amory, of Boston, by Gilbert Stuart; withdrawn by Miss Helen Amory Ernst.

Twenty old masters intrusted to the gallery in 1924 by Mrs. Ralph Cross Johnson for temporary care and display; withdrawn by her

daughter, Mrs. Marshall Langhorne, as follows: Portrait of the Duke of Sussex, by Sir William Beechey; View of St. Paul's and Black Friar's Bridge, by Calcott; Large Landscape, Dedham Vale, and Small Landscape, Heavy Clouds, by Constable; Portrait of Henry, Prince of Wales (or Charles), by Janssens; Portrait of Ruben's Wife, by Jordaens; Self Portrait, by Lawrence; Festive Scene, by Jan Molenaer; Portrait of a Man, by Raeburn; Portrait of Richard Brinsley Sheridan, Portrait of Lord Lifford, Portrait of Mrs. Lloyd, and Portrait of Lord Roth, by Reynolds; Interior of Kings College Chapel, Oxford, by David Roberts; Marine, Approaching Storm, by Stanfield; Dutch Landscape with figures, by Van Strij; Italian Landscape, Classical Landscape, and Small Landscape, by Richard Wilson; Small Seascape, by Guardi.

Fourteen paintings by British and Dutch masters, lent by Henry Cleveland Perkins, Esq., in 1922, withdrawn by the heirs of Mr. Perkins, as follows: Portrait of a Man, by Sir William Beechey; Portrait of a Boy, by John Hoppner; Cottage Scene, by Ladbrooke; Portrait of Henry, First Earl Mulgrave, by Sir Thomas Lawrence; Portrait of a Dutch Lady, by Michael Janson Mierevelt; Portrait of a Girl, by John Opie; Portrait of Frances, Countess of Clermont, by Sir Joshua Reynolds; The Windmill, by Salomon Ruysdael; two Studies of Ruins, and a Landscape, by Richard Wilson; Landscape, by an Unknown Artist; Madonna and Child, attributed to Van Dyck; Portrait of Dutch Lady, by Jan Victoors.

The John H. McFadden collection of 43 British masters, received by the gallery in July, 1922; withdrawn by the trustees of the collection to be transferred to its permanent home in the Philadelphia Museum of Art. The list follows: A Coast Scene, Normandy, by Richard Parks Bonington; The Lock, Hampstead Heath, Storm Coming Up and The Dell in Helmingham Park, by John Constable; Going to the Hayfield, 1849, by David Cox; Blacksmith Shop, near Hingham, Norfolk, and Woody Landscape, at Colney, by John Crome; Henrietta, Lady Rodney, and A Classical Landscape, by Thomas Gainsborough; The Misses Leader, The Leader Children, and Mrs. Weddell and Children, by George Henry Harlow; The Assembly at Wanstead House and The Fountaine Family, by William Hogarth; Mrs. Hoppner, by John Hoppner; Miss West (afterwards Mrs. William Woodgate), by Sir Thomas Lawrence; The Refuge (or The Storm), 1853, by John Linnell, sr.; Old Coaching Days, the Fruits of Early Industry, and The Happy Cottagers, by George Morland; Lady Belhaven, Master Thomas Bissland, Master John Campbell of Saddell, Col. Charles Christie, Lady Elibank, Mr. Lawrie, of Woodlea, Castle Douglas, Alexander Shaw, and Portrait of a Gentleman, by Sir Henry Raeburn; Master Bunbury and The

Right Hon. Edmund P. Burke, M. P., by Sir Joshua Reynolds; Mrs. Crouch, Mrs. De Crespigny, Mrs. Finch, Lady Grantham, Lady Hamilton (study head), Mrs. Tickell, Rev. John Wesley, and Little Bo-Peep, by George Romney; Landscape with Cattle, by James Stark; Laborers—The Brick Cart, 1767, by George Stubbs; Burning of the Houses of Parliament, by J. M. W. Turner; Sir Walter Scott, Bart., by Sir John Watson-Gordon; View on the Thames, by Richard Wilson.

Five paintings by French masters, withdrawn by the Hon. and Mrs. Louis A. Frothingham; The Lake (panel) and Twilight on the River Oise, by C. F. Daubigny; The Little Marauders (panel) and Group of Dogs (Fox Hounds) (panel), by Narcisse Diaz; The Setting Sun (canvas), by J. B. C. Corot.

Mention should be made here of the privilege granted by the gallery to the sculptor Moses W. Dykaar, who has been permitted to temporarily occupy room 29 in the National Museum, which is assigned to the gallery as a studio and workroom.

MISCELLANEOUS

The wall coverings of the gallery, the background for the paintings and other art works, are a consideration of first importance. The burlaps applied to the walls six years ago gradually faded to a golden brown, giving a rich effect to the halls, but later changed to a dull brown so somber that it was removed and replaced in part by burlaps of a light-green tone, a little too positive but contrasting agreeably with the warm tones of the paintings.

A number of burlap-covered screens for gallery use, a prime necessity in accommodating overflow of exhibits, were added to the already large supply. Four easels required for the display of paintings of special note were added, besides one exhibition case of the gem type, eight mahogany settees, and four pedestals for the installation of portrait busts. The gallery to-day is not crowded as heretofore and presents a more finished and restful appearance than at any previous date. Oil paintings, 337 in number, and 82 drawings in various mediums by French artists of note are shown to good advantage on folding screens in the south room, and 70 works worthy of a place in the gallery are held in reserve to be utilized as opportunity occurs.

LIBRARY

The gallery library has added by gift, purchase, and subscription 1,096 numbers to its upward of 1,500 volumes, pamphlets, and periodicals, and 12 water-color paintings by W. H. Holmes, gift of the artist.

It was found possible to enlist the services of Miss Helen V. Barnes, junior librarian, for a period of two months, to assist in the Smithsonian library as a return for work done in that library for the gallery.

PUBLICATIONS

HOLMES, W. H. Report on the National Gallery of Art for the year ending June 30, 1927. Appendix 2, report of the Secretary of the Smithsonian Institution for the year ending June 30, 1927, pp. 53–61.

——— The National Gallery and the Scope and Functions of an Art Museum. No. 5 of the series under Topic 14—Arts, Topical Survey of the Government. United States Daily, Washington, July 17, 1927, Vol. II, No. 106.

Catalogue of A Collection of Portraits by Bernhard Österman, Member of the Royal Swedish Academy of Arts, on view in the National Gallery, Natural History Building, United States National Museum, January 16 to January 24, 1928. Washington, 1928, pp. 1–4; 6 illustrations.

Catalogue of a collection of paintings by contemporary British artists on view in the National Gallery, Natural History Building, United States National Museum, March 5 through April 1, 1928. Washington, 1928, pp. 1–8.

Respectfully submitted.

W. H. HOLMES, *Director.*

Dr. CHARLES G. ABBOT,
Secretary, Smithsonian Institution.

APPENDIX 3

REPORT ON THE FREER GALLERY OF ART

SIR: I have the honor to submit the eighth annual report on the Freer Gallery of Art for the year ending June 30, 1928:

THE COLLECTIONS

Additions to the collections by purchase are as follows:

POTTERY

28.1. Persian, thirteenth century. Rhages. A large jar, with bands of ornament in bold relief. Dark blue glaze with traces of red painting and gilding. A fine specimen of great significance.

28.2. Persian, twelfth-thirteenth century. Rhages. A goblet, with a painted decoration over a white enamel glaze. The colors are red, blue, grayish-yellow, and light green.

PORCELAIN

28.3. Chinese, early eighteenth century. A shallow bowl with a floral decoration painted in enamels over a white glaze. Mark: Yung Chêng in blue enamel.

28.4. Chinese, early eighteenth century. A shallow bowl, covered by a white glaze inside and a light green glaze outside. The floral decoration is painted in enamels over glaze. Mark: Yung Chêng in blue enamel.

28.5. Chinese, early eighteenth century. A small shallow bowl, covered by a white glaze inside and a rose pink glaze outside. The decoration of bamboo is in two tones of green enamel, inlaid in the glaze. Mark: Yung Chêng in blue enamel.

PAINTINGS

28.6. Persian, late thirteenth century. Abbasid School.

28.7. Two leaves from a ms. book, probably a Manāfi-al-Hayawān. Each page bears a painting of birds and foliage, rendered in water colors and gold.

28.8. Persian, sixteenth-seventeenth century. Turkish School. A battle scene, with mounted warriors, foot soldiers with shields, and a phalanx of chariots. It is rendered in pale colors and gold on a long strip inlaid in a page of manuscript.

28.9. Persian, early sixteenth century. Bukhara School. A portrait of a youthful prince, standing. It is painted in opaque white and green pigment and gold on a ground of pale green.

28.10. Persian, early seventeenth century. Rizā 'Abbāsī School. A youth kneeling and holding out a wine cup. It is painted in black outline with areas of color, and slight gold.

28.11. Persian, early fifteenth century. Timurid period. A battle scene, the siege of a fortress, painted in colors and gold; an illustration in a page of manuscript.

The work of the care and preservation of objects in the collection, which goes forward year by year, has this year included the remounting of four Japanese screens, in addition to completing the work on Japanese screen 01.173, which was begun in the spring of 1927. Twenty-two paintings in the American section have been put in condition. Changes in exhibition during the year have involved 168 different objects, itemized as follows:

63 Whistler etchings.
40 Whistler and other oil paintings.
11 Japanese screens.
6 Japanese lacquer and sculpture.
7 Japanese panels.
4 Chinese pottery.
28 Near Eastern paintings.
1 Indian sculpture.
6 Near Eastern pottery.
2 Siamese sculptures.

Two hundred and twenty-four objects have been submitted for an expert opinion upon them, or for translation of their oriental inscriptions. Thirty-four other translations of inscriptions have been made from photographs submitted to the curator.

Additions to the library include 26 volumes, 28 periodicals, and 59 pamphlets. The Chinese library of the eminent oriental scholar, the late William Woodville Rockhill, which was presented by Mrs. Rockhill to the Smithsonian Institution in the autumn of 1927 and deposited in the Freer Gallery, forms an important addition to the Chinese section of the library. The Rockhill collection comprises 1,100 volumes, ranging in date of publication from 1659 to 1913. A list of the new accessions accompanies this report as Appendix A (not printed).

The books of the field staff comprise a separate and movable unit of the general reference library and are at present installed at the gallery. The total number of volumes in this branch is 661; unbound periodicals, 134; pamphlets, 439; catalogues, 36; and bulletins, 9. Thirty-six volumes have been added during the current year. A complete list of books in the field library accompanies this report as Part II, Appendix A (not printed).

As noted in the report of last year, the demand for photographs by special students and others is constantly increasing the store of negatives. The total number of these is now 1,491, in addition to

829 negatives of Biblical MSS. A certain number of prints from these negatives are always kept in stock to meet the popular demand; others can be obtained upon order. The total number of sales of reproductions are as follows: Photographs, 1,089; negatives, 2; a rubbing from a Chinese stone relief, 1; lantern slides, 100; post cards, 2,017. All of the foregoing are sold at their cost prices.

The pamphlets issued by the gallery have been increased by a "List of paintings, pastels, drawings, prints, and copper plates, by and attributed to American and European artists, together with a list of original Whistleriana in the Freer Gallery of Art" (Smithsonian Publ. No. 2963), dated March 20, 1928. Sales of gallery publications were as follows:

F. G. A. Pamphlets		319
Synopsis of History		306
Gallery books:		
Gallery VIII	22	
Gallery IX	28	
Gallery X	20	
Gallery XI	16	
Gallery XII	173	
		259
Outline of Study:		
Course I		28
Course II		13
List of paintings, pastels, etc		95
Floor plans		11

THE BUILDING

The shop has been constantly occupied during the year with the making of necessary stands, frames, and cases, general repair work, and the fitting up of two additional workrooms, namely, an office for the field staff and a room for operating the mimeograph and photograph press. 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. The total attendance for the year was 111,288. The aggregate Sunday attendance was 32,279, with an average of 620. The week-day attendance amounted to 79,009, with an average of 305. It reached its highest totals in the months between April and October, inclusive. The total number of visitors to the office was 1,218. Of these, 171 came for general information; 48 to study the building and museum methods; 64 to submit objects for examination; 262 to see objects in storage; 221 to study in the library; 80 to see the facsimiles of

the Washington MSS; 23 to make drawings; 4 to make photographs; and 182 to purchase photographs. Thirty-three classes were given instruction, four groups were given docent service in the galleries, and two lectures were delivered in the auditorium, as follows:

February 25: Dr. Alfred Salmony, on "Les Problèmes de la Sculpture dans les Indes Orientales." Illustrated.

March 16: Mr. Carl W. Bishop, on "Archeological Research in China." Illustrated. The latter lecture was given under the combined auspices of the Archæological Society of Washington and the Art and Archæology League.

This report marks the close of the fifth year of the Freer Gallery as an institution open to the uses of the public. During these years

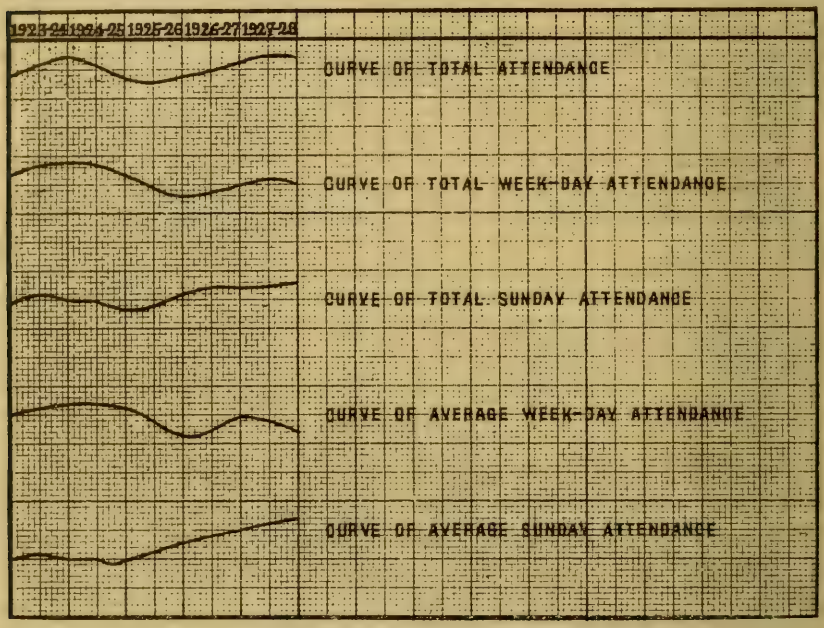


FIG. 1

the total attendance has been fairly constant, that of the first year reaching 111,942; that of the fifth year, 111,288. The Sunday attendance has noticeably increased, being slightly more than twice as great as week-day attendance during the past year. Figure 1 indicates in graphic form the total and average attendance since the gallery was first opened to the public.

Last winter for the space of a month a record was kept of the average length of time spent by visitors in the exhibition galleries. During the time that this observation was being made the longest visit lasted 2 hours and 45 minutes; the shortest, 11 minutes. Figure 2 indicates the average stay.

While the above records give some indication of the response of the general public to the exhibitions, another survey indicates the demand made upon the inner resources of the gallery by that smaller section of the public which has an especial interest in the field of art represented in the collections. It is interesting to note the steady growth of this group with its demands analyzed in Figure 3.

FIELD WORK

Owing in part to conditions in China and in part to the large amount of material already secured for study, Mr. C. W. Bishop, associate curator, was, as stated in the report for last year, temporarily recalled to the gallery. He traveled by way of Egypt and the principal western European countries, where he visited collections and sites of importance and held discussions with a number of prominent archeologists. Since his arrival in Washington he has been engaged principally in working up the material collected during his four years and a half in the field.

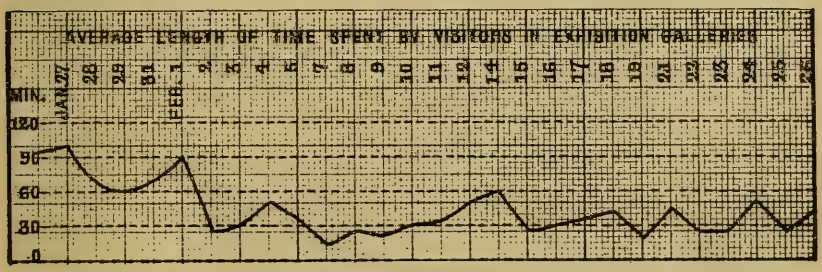
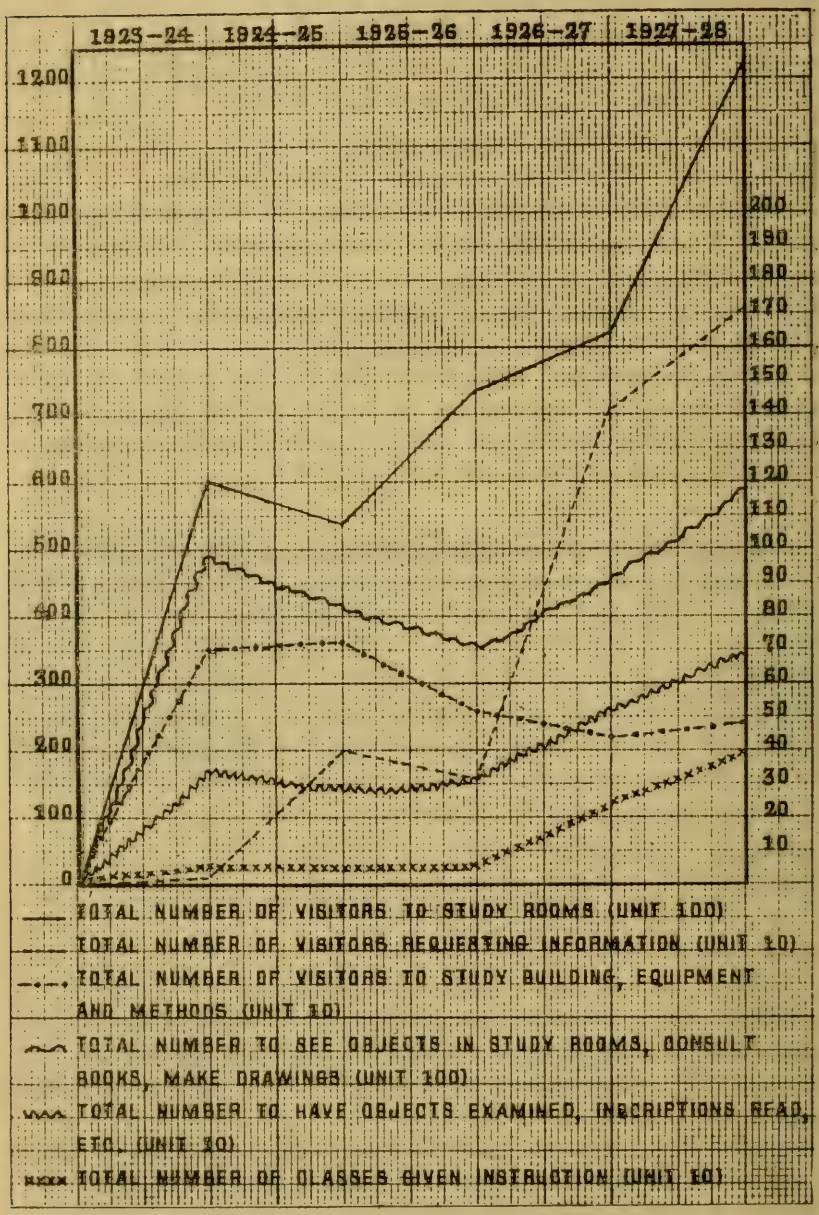


Fig. 2

Dr. C. Li and Mr. K. Z. Tung, the Chinese members of the field staff, were left in China in order to maintain the contacts already established with various Chinese scientific bodies and to prepare the way for further field work at an early date. In both these tasks they have achieved gratifying success. Negotiations are at present being conducted with the newly-founded bureau of scientific research, an organization whose character and aims correspond somewhat closely to those of the Smithsonian Institution, for cooperation in archeological investigation.

Early in the present summer Doctor Li was called to the gallery to discuss future field work and to complete, with the aid of the facilities now available in Washington, his report on his excavations in southwestern Shansi Province. He plans, upon his return to China, to establish a field station as a semipermanent base of operations, thus permitting the uninterrupted prosecution of excavation for much longer periods.


1923-24
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TOTAL NUMBER OF VISITORS TO STUDY ROOMS (UNIT 100)
TOTAL NUMBER OF VISITORS REQUESTING INFORMATION (UNIT 10)
TOTAL NUMBER OF VISITORS TO STUDY BUILDING, EQUIPMENT AND METHODS (UNIT 10)
TOTAL NUMBER TO SEE OBJECTS IN STUDY ROOMS, CONSULT BOOKS, MAKE DRAWINGS (UNIT 100)
TOTAL NUMBER TO HAVE OBJECTS EXAMINED, INSCRIPTIONS READ, ETC. (UNIT 10)
TOTAL NUMBER OF CLASSES GIVEN INSTRUCTION (UNIT 10)

FIG. 3

A detailed account of the activities of the field staff will be found in Appendix B, herewith submitted (not printed).

PERSONNEL

Mr. Herbert E. Thompson, with his assistant, Mr. Finlayson, worked on the preservation of 22 oil paintings.

Mr. Y. Kinoshita, of the Museum of Fine Arts, Boston, worked at the gallery from January 3 to June 16 on the preservation of oriental paintings.

Miss Christabel E. Hill has been added to the field staff as stenographer.

Mr. A. G. Wenley, field assistant, spent the year in study under Pelliot and Élisséeff, in Paris.

Dr. Chi Li, of the field staff, reported at the gallery on May 26 for a stay of two months.

Respectfully submitted.

J. E. Lodge,
Curator, Freer Gallery of Art.

Dr. C. G. Abbot,
Secretary, Smithsonian Institution.

APPENDIX 4

REPORT ON THE BUREAU OF AMERICAN ETHNOLOGY

SIR: 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, 1928, is herewith submitted. This work was conducted in accordance with the act of Congress approved February 11, 1927, which contains the following item:

American ethnology: For continuing ethnological researches among the American Indians and the natives of Hawaii, the excavation and preservation of archeologic remains under the direction of the Smithsonian Institution, including necessary employees, the preparation of manuscripts, drawings, and illustrations, the purchase of books and periodicals, and traveling expenses, $58,720, of which amount not to exceed $48,000 may be expended for personal services in the District of Columbia.

Dr. J. Walter Fewkes, chief of the bureau since March 1, 1918, continued to occupy that position until January 15, 1928, when he retired as chief but continued on the staff of the bureau as associate anthropologist.

The general program of the bureau for the entire year has been similar to that of the last fiscal year.

Doctor Fewkes's scientific work has been mainly devoted to the preparation of a report on his excavations at Elden Pueblo, Ariz., made during the summer of 1926.

Dr. John R. Swanton, ethnologist, completed the proof reading of his papers on the Social Organization and Social Usages of the Indians of the Creek Confederacy, the Religious Beliefs and Medical Practices of the Creek Indians, The Culture of the Southeast, and a paper by the late William E. Myer on Trails of the Southeast, all of which have appeared in the forty-second annual report of the bureau, and of a short paper on the Social and Religious Usages of the Chickasaw Indians which is to appear in the forty-fourth annual report. He spent some time in continuing the preparation of a tribal map of aboriginal North America north of Mexico and the text accompanying, and assisted in the preparation for publication of James Mooney's paper on The Aboriginal Population of America North of Mexico, which appeared as volume 80, No. 7, of the Smithsonian Miscellaneous Collections.

Work in connection with the Timucua dictionary, with the help of Miss Tucker, was continued during most of the year. In 1926,

Miss Irene Wright, in the employ of the Florida State Historical Society, discovered a letter in the archives of the Indies at Sevilla written in the Timucua language. Part of the work of preparing this material for publication by the society has been done by Doctor Swanton, and in the same volume an earlier letter, discovered and published by Buckingham Smith is to be included. Although this publication is being done outside, it will furnish in more convenient and reliable form all of the known material which we have not yet drawn upon for the dictionary, some scattered words alone excepted. Doctor Swanton has been called upon for an unusual amount of advisory and other special work during the past year.

From July 1 to 22 Dr. Truman Michelson, ethnologist, continued ethnological and linguistic work among the Sac and Fox of Iowa. From the latter part of July to the end of August he was engaged in work on the Northern Arapaho, devoting his time mainly to linguistics, and was able to unravel a number of complex phonetic shifts whereby a larger proportion of Algonquian elements in the language were made more certain than hitherto suspected. He also took physical measurements of a number of Arapaho and Shoshoni Indians. As far as the latter is concerned, the cephalic index of his series agrees closely with that obtained under the direction of Doctor Boas more than 20 years ago. After his return to Washington, September 1, he corrected the proofs of his notes on the buffalo-head dance of the thunder gens of the Fox Indians, which will appear as Bulletin 87 of the bureau.

Doctor Michelson submitted for publication a work entitled "Observations on the Thunder Dance of the Bear Gens of the Fox Indians," which is to be issued as Bulletin 89 of the bureau. He has also submitted a manuscript designated "Sketch of the Buffalo Dance of the Bear Gens of the Fox Indians." He worked out a complete translation of a syllabic text supplementary to his paper in the fortieth annual report. A number of technical papers have been prepared by Doctor Michelson and published in various scientific journals. Doctor Michelson from time to time has furnished data to answer official correspondence.

Mr. J. P. Harrington, ethnologist, spent the year in a study of the Mission Indians of the Santa Barbara region of California and of the Taos Tribe of north-central New Mexico.

Leaving for the field in the fall of 1927, Mr. Harrington resumed his field studies at Santa Barbara with great success, securing a mass of important linguistic information from the last few aged survivors of the proud and highly cultured people which only a few decades ago thickly populated the islands and mainland coasts of the Santa Barbara region. The material covered the entire range of knowledge of the informants and included difficult translations into

the Chumashan. These translations now include an almost exhaustive study of the earlier period of Chumashan history. The grammatical material was all perfectly heard and reaches into every corner of phonetic phenomena and grammatical construction. The work contains a new and exhaustive study of the early voyages, proving, among other points that will have great popular interest, that Cabrillo was the discoverer of Monterrey. It also contains translations made by Mr. Harrington of the diaries of the early land expeditions, throwing new light on hitherto dark chapters of the earliest history of Alta California, since this history is here for the first time dealt with from the Indian viewpoint. In this work Mr. Harrington has cooperated with Fr. Zephyrin Engelhardt, custodian of the Santa Barbara Mission archives, and with Dr. H. E. Bolton and other friends at the Bancroft Library of the University of California.

Returning to Washington in March, Mr. Harrington elaborated his recent notes and prepared his Taos material for publication. This consists of a thorough presentation of the documents of Taos Indian history, all of them worked through afresh and provided with new original translations by Mr. Harrington, a presentation of Taos ethnology, and a comprehensive vocabulary of the Taos language, which, as Mr. Harrington has recently pointed out, has close genetic relationship with the Kiowa language.

At the beginning of the fiscal year 1928 Mr. J. N. B. Hewitt, ethnologist, undertook a detailed study and interpretation of certain Onondaga Iroquoian texts recorded by him in former years relating to the wind or air gods, who are in fact disease gods of Iroquoian mythic thought. These texts are Delphic in their brevity, and so are most difficult to interpret and to correlate. They are only brief myths, most of the details of which have been forgotten, and so the mode of telling them has become oracular.

Mr. Hewitt read the galley proof of his paper in the forty-third annual report of the bureau, Iroquoian Cosmology, Second Part. Severe illness during the early winter delayed this work, but upon partial recovery he completed this task and also the final reading in page proofs.

Mr. Hewitt also edited Mr. Edwin Thompson Denig's manuscript, Report on the Indian Tribes of the Upper Missouri to the Hon. Isaac H. Stevens, Governor of Washington Territory. He added an introduction to the report, with a brief biography of the author.

As the representative of the Smithsonian Institution on the United States Geographic Board, Mr. Hewitt attended the meetings of the board and of the executive committee of that board, of which he is also a member.

As custodian of the bureau manuscripts, Mr. Hewitt reports the continuation of the work of recataloguing the manuscript material

and the phonograph music records belonging to the archives. Miss M. W. Tucker typed the cards and stored the material, and also catalogued 250 cylinders of the Osage Indian songs and rituals. These were verified by Doctor LaFlesche with the use of the phonograph, and are therefore authentic. Mr. Harrington has also turned over his collection of 100 cylinders. Miss Densmore has, to date, a total of 1,697 cylinders listed and filed.

There are now 3,079 manuscripts in the archives, and about 626 phonograph records, in addition to those of Miss Densmore.

On May 18, 1928, Mr. Hewitt left Washington to continue his studies among the Iroquoian and Chippewa tribes in Canada. He visited the Chippewa at Garden River to revise certain cosmic texts acquired in 1900 from Mr. John Miscogeon, of Bay View, Mich., and from Mr. George Gabaoosa, of Garden River, in 1921. He also visited the Huron remnant at Loretteville, near the city of Quebec, Canada, to ascertain whether any knowledge of an institution resembling closely the League of the Five Iroquois Tribes formerly extant among the Hurons then dwelling about Lake Simcoe still existed among this remnant of the Hurons. But no remembrance of it was found.

He also visited the Caughnawaga Mohawk living near Montreal, where information regarding the league and its institutions was sought, but he found only a jumble of ideas coming from the old religious thought of the natives, from the so-called Handsome Lake reformation, and from the hazy ideas instilled into them by the missionaries. Here Mr. Hewitt also sought information tending to identify the so-called Seven Nations of Canada, etc., who have recently become a problem for the Canadian Department of Justice and of the law department at Albany, N. Y.

Mr. Hewitt's most fruitful field of research was among the Six Nations of Iroquois living on the Grand River grant not far from Brantford, Canada. Here he undertook the free translation of the historical tradition of the founding of the League of the Five Iroquois Tribes in the closing decades of the sixteenth century, as related by the Mohawk and the Onondaga, which embodies the farewell address of Deganawide, the master mind in the work of establishing that institution. He also revised the seven myths in native Onondaga texts relating to the gods of the air and the wind who control diseases.

He also was fortunate enough to secure the emblem of official authority of the fire keeper of the council of the league to open and to close the sessions of the council.

Mr. Hewitt, as usual, has devoted much time to providing, through careful research, data for replies to the many correspondents of the bureau.

During the fiscal year ended June 30, 1928, Dr. Francis LaFlesche, ethnologist, completed two manuscripts: Wa-sha-be A-thi^{n}, containing 270 pages, and Wa-wa-tho^{n}, or Pipe Ceremony, containing 110 pages. Another manuscript is in the hands of the editor, entitled "The Child-Naming Ritual."

He started a dictionary of the Omaha language, obtaining about 7,000 words with both the Indian and the English meaning and usage. In November he began the compilation of a dictionary of the Osage language. About 20,000 words with their full meanings and usage have been completed.

The month of July, 1927, and the first part of August were spent by Dr. F. H. H. Roberts, jr., archeologist, in the Chaco Canyon, N. Mex., completing the excavation of a late basket-maker site. It was discovered that the latter had been a village consisting of 18 houses, a kiva or circular ceremonial structure; 48 storage bins; and a court. Definite knowledge of the house type was obtained during the progress of these excavations, as well as other information of value concerning one of the lesser known stages in the cultural development of the sedentary, agricultural Indians of the prehistoric Southwest. The work in the Chaco added materially to the information on southwestern archeology.

Two weeks of August were spent in southeastern Utah in a reconnaissance along Montezuma Creek, one of the northern tributaries of the San Juan. The purpose of this reconnaissance was to locate additional late basket-maker sites which might warrant intensive investigation. Despite heavy rains and flooded conditions of the streams, he was able to make his way up Montezuma Creek a distance of 40 miles. Several late basket-maker sites were observed, but in every case the remains were so eroded that it was not deemed advisable to do any excavating. Several ruins were visited which were of interest because they had been noted and described by W. H. Jackson in the Hayden survey report for Colorado and adjacent territory, 1876. Although unique from an architectural standpoint, the ruins belong to the late Mesa Verde era, the period when the pottery characteristic of the large Mesa Verde pueblos and cliff dwellings was in vogue.

At the end of August Doctor Roberts went to Pecos, N. Mex., where he attended the conference of southwestern archeologists and ethnologists held at the Pecos ruins, where the Andover Academy expedition under Dr. A. V. Kidder was completing its extensive investigations of that well-known pueblo. While at the conference he assisted in the drafting of a new outline of the sequence of cultural stages in southwestern prehistoric and early historic development of the sedentary Indian groups.

The first week in September found him at Folsom, N. Mex., where workmen of the Colorado Museum of Natural History, Denver, had uncovered several projectile points in direct association with the bones of an extinct species of bison, *Bison taylori*. Several days were spent in investigating the fossil bed and the surrounding territory. Doctor Roberts was so impressed with the find that he sent for Dr. A. V. Kidder, of the Andover Academy and the Carnegie Institution of Washington, and with him again went carefully over the problem presented. At the conclusion of the investigations Doctor Roberts and Doctor Kidder were convinced that the bones and the projectile points had been deposited in the stratum contemporaneously. He returned to Washington early in October.

The winter was spent in the preparation of a manuscript on the season's work, entitled "Shabikeshchee Village, a Late Basket Maker Site in the Chaco Canyon, New Mexico." Another manuscript on Certain Cave Sites Near El Paso, Tex., was also completed.

In February Doctor Roberts went to Melbourne, Fla., to view, in situ, a projectile point which Dr. J. W. Gidley, of the United States National Museum, had found in a stratum from which he was removing the bones of extinct Pleistocene animals. The projectile point and bones were from the same stratum which in previous work had yielded the crushed skull of a human being. It is around the latter that much anthropological and paleontological discussion has centered during the last two years. Doctor Roberts took advantage of the trip to Melbourne to visit a number of shell heaps and mounds left by some of the earlier Indian inhabitants of the region.

In May, 1928, Doctor Roberts made a reconnaissance along the San Juan River to a point about 10 miles south of Rosa, N. Mex. Returning to Arboles, Colo., a short survey and inspection was made of the ruins and ruin sites along the Piedra River, one of the larger tributaries of the San Juan. As a result of the latter it was determined to excavate a site located on a bluff 100 feet above the river on the east side of the Piedra 15 miles north of Arboles.

The month of June was spent in an intensive investigation of the above site, which proved to be a Pueblo I village. Of the 24 houses excavated, 21 were single-room structures. Of the remaining 3, 2 had been 2-room domiciles, while the third had contained three cell-like rooms. It was found that the structures varied considerably in size, some of them being but 5 to 6 feet square, while others were 25 to 30 feet in length by 6 to 9 feet in width, but all had been constructed in the same manner. In most cases there had been a slight excavation measuring from 6 inches to 1 foot in depth. This pit portion of the dwelling, if the slight excavation may be so called,

was roughly rectangular in shape. At an average distance of 10 inches from each corner a large post had been set in the floor. These four posts appear to have carried at their tops a rectangular framework, which formed the support for the roof and walls. Both the roof and walls had had a framework of small poles, which was covered with adobe plaster averaging 6 inches in thickness. The roof proper seems to have been flat, while the walls had a slight slope due to the fact that the poles which formed them had had their lower ends embedded in the earth around the edges of the shallow pit, while their upper ends leaned against the framework at the tops of the large support posts. In most cases the rooms were entered by means of a small doorway in the center of one of the side walls. One or two of the structures gave the suggestion of a roof entrance. In all cases the doorway seems to have had a large stone slab for a cover.

There seems to have been a definite method of grouping the houses, from four to eight or more of them being grouped in a semicircle around a circular depression. Two of these depressions were excavated and two more were trenched in the hope that they might be found to contain kivas or ceremonial rooms, but in all four cases they were found to be nothing more than pits. It is quite possible that the earth used in making the plaster to cover the wooden framework of the structures was taken out of these pits; possibly the plaster itself was mixed there, while the hole remained to serve as a reservoir for the storing of water. In each case the lower portions of the pits gave distinct evidence of having been filled with water.

Refuse mounds containing burials were found in most cases to lie some distance south or southeast of the house clusters. The burials were of the contracted form, the body being placed in the shallow grave with the knees drawn up to the breast and the lower limbs tightly flexed to the upper. Accompanying each burial were two or three pottery vessels as mortuary offerings.

A good collection of pottery and other specimens was secured from the houses and graves.

An interesting sidelight on the village is that it was destroyed by fire, presumably in the fall or early winter, as practically every vessel found in the structures contained corn, beans, wild cherries, or some other form of vegetal food. It appears that very little of the harvest had been used when through some mischance or other the village was devastated by flames. Two of the inhabitants were trapped in the houses, as the findings of the skeletons on the floor would indicate. In both instances the remaining fragments of bone showed clearly the marks of fire, and there was every evidence to show that the bodies had been consumed in the flames.

SPECIAL RESEARCHES

Research in the music of the American Indians has been carried forward during the past year by Miss Frances Densmore, a collaborator of the bureau. In October, 1927, Miss Densmore visited the Winnebago in Wisconsin, recording songs and interviewing many Indians within a radius of about 20 miles around Black River Falls. Eighty-three songs were recorded, with data concerning their origin and use, and the singers and their environment were photographed. The winter feast (also known as the war-bundle feast) and the buffalo dance received special consideration, as these are distinctively Winnebago ceremonies. Twenty-five winter feast songs were recorded, including those of the night spirit, morning star, sun, bear, and thunderbird bundles. The songs were recorded and information given by men who habitually attend this feast, given annually in Wisconsin and Nebraska. The use of music in the treatment of the sick was found to be similar to that of the Chippewa and, in some respects, to that of other tribes. The principal informant on this subject was John Henry, living at Trempeleau, who recorded the songs used by his grandfather when treating the sick. Additional old healing songs included those formerly used by a Winnebago named Thunder and recorded by his sons. Herb remedies were administered and songs sung to make them effective.

Among the war songs is a group composed by members of the tribe when serving in France with the United States Army during the recent war. These express a high patriotism and are interesting examples of songs composed by several persons in collaboration. This is a phase of musical composition which has been observed among the Sioux and Makah, as well as among Indians of British Columbia. Other classes of recorded Winnebago songs are those of the Heroka (bow and arrow spirits), songs to calm the waves, songs received in dreams, and songs of the moccasin game.

One purpose of the work among the Winnebago was to ascertain whether their songs resembled those of the neighboring Chippewa or the related Sioux. The songs show a distinct resemblance to the Chippewa and to the Menominee. Each tribe has its own songs, and exceedingly old songs of each tribe have been obtained, but there is a general resemblance in the melodic trend.

The study of material obtained at Neah Bay, Wash., and in British Columbia in 1926, as well as Menominee material obtained in 1925, was continued, together with the work on Winnebago songs. Eight manuscripts were submitted with the following titles: "Dance and dream songs of the Makah and Clayoquot Indians"; "Miscellaneous Makah and Clayoquot songs and Makah customs"; "Nitinat

war and dance songs and Menominee songs connected with stories of Manabus, with catalogue numbers of 184 songs"; "Songs of Nitinat medicine men and miscellaneous Nitinat songs, with catalogue numbers of Nitinat songs"; "Songs of Indians living on the Fraser and Thompson Rivers in British Columbia"; "Winnebago songs of the Winter Feast"; "Winnebago songs used in the treatment of the sick"; and "Winnebago war songs, with catalogue numbers of Winnebago songs."

The paper on Makah customs includes a consideration of such topics as the construction of houses and canoes, tools, rope, clothing, fishing, cooking, tatooing, and wedding customs, also methods of making observations of the sun, and beliefs concerning petitions for supernatural help.

Early in June ,1928, Mr. H. Hughes, of Ono, Russell County, Ky., advised the Smithsonian Institution of certain Indian objects recently exhumed from a cave in the bluffs bordering Wolf Creek, a branch of Cumberland River. To examine these objects and the scene of their discovery, Mr. Neil M. Judd, curator of American archeology, United States National Museum, was directed to proceed to Ono.

Accompanied by Mr. Hughes, Mr. Judd called upon the three gentlemen concerned with the discovery of the material in question, examined the specimens, and later visited the shallow cave from which they had been removed. The collection included parts of three skeletons—two adults and an adolescent—a fragment of a buckskin head band with fiber ropes attached, fragments of an olivella shell necklace, a covered basket, and portions of two others. The basket, certainly the most important of the several items, was woven of split reeds; it is about 20 inches long, 8 inches wide, and 8 inches deep, and was provided with a cover of approximately equal size that fitted completely over the container. The basket is doubtless of Cherokee origin; pottery fragments found in the cave tend to confirm this deduction.

Owing to the fact that the site of discovery is only a shallow shelter in a thick stratum of disintegrating shale, it is truly remarkable that these textile fragments should have been so well preserved. Layers of burned clay and ash indicated frequent though intermittent use of the shelter by Indian peoples. Fragments of corncobs, one small red bean, gourd rind, and squash seeds were observed among the shaly deposits covering the narrow floor space.

During the summer and early fall of 1927 archeological investigations for the Bureau of American Ethnology were continued by Mr. H. W. Krieger, curator of ethnology, United States National Museum, in the arid section of the Columbia Basin and in the lower valley

of Snake River. During the preceding year the region extending from the mouth of the Yakima River to the Canadian border was explored. During the season of 1927 exploration of archeological sites was continued from the mouth of the Yakima River to Mosier, Oreg., in the vicinity of The Dalles. At this point an appreciable increase in rainfall and forest growth marks the dividing line between the humid northwest coast and the arid plateau of the interior.

In most essentials the early occupants of the upper plateau possessed a remarkably uniform culture. It was found that the subculture area of north-central Oregon appears to be distinguished by the excellent chipping of weapon points and tools from obsidian, jasper, agate, and chalcedony. The subarea of The Dalles and Miller Island, the so-called "Dalles culture," is characterized to a greater degree than is the subarea of north-central Oregon by realistically shaped animal and human figurines executed in stone and wood and appearing on wooden combs, stone pestle heads, stone bowls, and as stone plaques. The subarea of The Dalles is also unique in the possession of a lozenge or ovoid-shape stone knife with beveled lateral surfaces shaped by rubbing. This type of knife was found in abundance at Lyle, Wash. In the Snake River Valley a form of bone or horn knife supplants the knife of chipped stone which prevails elsewhere in the Columbia Basin, except in the areas mentioned.

Materials used as tools or as media on which to execute art designs are characteristic of very restricted localities and vary in many instances from village to village. The distinctions are the more clear cut the more ancient the site and the more free the area from the influence of contiguous culture areas.

At Page, Wash., on the Snake River, about 20 miles from Pasco, were noted definite departures from the general type of archeological remains characteristic of the sites along the Columbia River. No copper ornaments or other objects of metal were found; nor were any objects uncovered, other than dentalium shell, that might indicate intercourse with British Columbia or with the tribes of the lower Columbia. Bone knives and scrapers here displaced those of chipped stone; weaving implements and perforators were of antler or bone instead of rubbed stone as on the Columbia. Pairs of sandstone arrow-shaft rasps; fine-grained, grooved stone polishers; basketry fragments, showing styles of false embroidery, lattice weave, and simple coiling and twining; ovoid stone clubs; and burials either with red paint or of the usual cremation group type—all these characteristics indicate a subculture area transitional between the Shoshoni on the east and south and the Shahaptian tribes of the middle Columbia Basin.

The type of early culture that existed within the arid sections of the Columbia Basin has become definitely established. Many of the

connecting culture and trade relationships are now known. The relationship with the Shoshoni and with other cultures on the south, those of the basket maker and the pueblo, is not yet clearly defined. Further research along the Snake River and its tributaries in southern Idaho, northern Utah, and Nevada will no doubt bring out additional evidence of relationships with the preagricultural peoples of the Southwest.

Mr. Henry B. Collins, jr., assistant curator of ethnology, and Mr. T. Dale Stewart, of the division of physical anthropology, United States National Museum, were detailed to conduct field work along the coast of western Alaska, including the island of Nunivak, for the purpose of observing these people, their manner of life, and their physical type, as well as to collect skeletal and cultural material from inhabited and abandoned villages. From the standpoint of the anthropologist, the section of Alaska from Bristol Bay northward along the coast to the mouth of the Yukon is one of much interest, for here dwell the most primitive group of Eskimo to be found in all of Alaska. The work was conducted under the auspices of the Bureau of American Ethnology, the United States National Museum, the American Association for the Advancement of Science, and the American Council of Learned Societies.

Transportation to Nunivak Island was obtained on the U. S. S. *Boxer*, through the courtesy of the Federal Bureau of Education, which operates this boat in the interest of the native schools it maintains throughout Alaska. The *Boxer* stopped at Unalaska, Akutan, and Ugashik on the Aleutian Islands and the Alaska Peninsula, and later at Kanakanak on the upper part of Bristol Bay.

Leaving Bristol Bay, the journey was continued northward along the coast, stopping at Kukukak, Togiak, Mumtrack, and Tanunuk. The Eskimo here live in small villages, usually along the coast near the mouth of a stream. They subsist principally on fish, seal, and birds, together with berries and a few other native plants. The most important item of their clothing is the parka, a long coatlike garment made of feathers or fur. Their dwellings are semisubterranean, consisting of a square or octagonal excavation from 1 to 3 feet deep, with walls and roof built up of successive tiers of driftwood logs, for there is no timber anywhere along the coast north of Bristol Bay. The outside is completely covered with sod.

For winter travel the Eskimo use sleds and dog teams, while in summer most of their journeys are made in the kayak, the ingeniously made skin boat so typical of the Eskimo everywhere.

On June 21 Mr. Collins and Mr. Stewart landed at Nash Harbor on the northwestern end of Nunivak Island, 48 days after leaving Seattle. Here at the small native village of Kligachimiuny is located

the school of the Bureau of Education. Nunivak Island is 70 miles long and about 45 miles wide, but there are no dependable charts of its shores except for two restricted localities.

While very little was definitely known of them, the Nunivak Eskimo have long been regarded as the most primitive in this remote region. This was found to be true. Women were found still wearing the lip, ear, and nose ornaments of beads and walrus ivory that were given up years ago by the other Eskimo of western Alaska. The elaborate observances and ceremonies relating to the hunting of the seal, and their social and religious life in general, furnish additional evidence of the extreme conservatism of these people.

The first work accomplished at Nash Harbor was the taking of measurements and physiological observations on the natives. Much of the western end of the island was explored on foot, bones and ethnological material being collected from several deserted villages and finally from the village at Nash Harbor. After completion of the work on the western end of the island, camp was removed to Amolowikimiut, a native village at Camp Etolin, some 30 miles to the east.

In August the party left Nunivak Island, Mr. Stewart going to St. Michael with the trader from Tanunuk villege, Nelson Island, while Mr. Collins stopped at Hooper Bay, an Eskimo village on the mainland between Nunivak and the Yukon, where additional collections were secured. From St. Michael the outward trip was made up the Yukon to Nenana, and thence to the coast to Seward, affording an opportunity to observe the Eskimo along the lower Yukon and later the Tinné Indians farther up the river.

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

Forty-second Annual Report. Accompanying papers: Social Organization and Social Usages of the Indians of the Creek Confederacy (Swanton); Religious Beliefs and Medical Practices of the Creek Indians (Swanton); Aboriginal Culture of the Southeast (Swanton); Indian Trails of the Southeast (Myer). 900 pp. 17 pls. 108 figs.

Bulletin 85. Contributions to Fox Ethnology (Michelson). 168 pp.

PUBLICATIONS IN PRESS

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-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 86. Chippewa Customs (Densmore).

Bulletin 87. Notes on the Buffalo-head Dance of the Thunder Gens of the Fox Indians (Michelson).

Bulletin 88. Myths and Tales of the Southeastern Indians (Swanton).

Bulletin 89. Observations on the Thunder Dance of the Bear Gens of the Fox Indians (Michelson).

Bulletin 90. Papago Music (Densmore).

DISTRIBUTION OF PUBLICATIONS

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

Report volumes and separates	1,450
Bulletins and separates	6,870
Contributions to North American Ethnology	23
Miscellaneous publications	783
Total	9,126

There was a decrease of 788 publications distributed, due to the fact that 1 less publication was distributed to the mailing list than in the previous year. The mailing list, after revision during the year, now stands at 1,713 addresses.

ILLUSTRATIONS

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

Drawings made (maps, diagrammatic and graphic illustrations)	55
Photographs retouched, lettered, and made ready for engraving	598
Engraved proofs criticized	582
Color prints examined at Government Printing Office	3,660
Illustrations catalogued for outside publications	350
Photographic negatives	96
Photographic prints	367
Enlargements	2
Development (films)	12
Color print	1

The development and printing of all photographic work was done in the laboratory of the United States National Museum by Dr. A. J. Olmsted in cooperation with the bureau in exchange for work done by Mr. Gill for other branches of the Institution. This arrangement, as in the previous year, has proved eminently satisfactory.

LIBRARY

The reference library has continued under the care of Miss Ella Leary, librarian, assisted by Mr. Thomas Blackwell. The library consists of 27,921 volumes, about 16,177 pamphlets, and several thousand unbound periodicals. During the year 780 books were accessioned, of which 115 were acquired by purchase and 665 by gift and exchange; also 3,980 serials, chiefly the publications of learned societies, were received and recorded, of which only 108 were obtained by purchase, the remainder being received through exchange. A considerable amount of time was given to preparing bibliographic lists for correspondents. Requisition was made on the Library of Congress during the year for an aggregate of 325 volumes for official use. An increasing number of students not connected with the Smithsonian Institution found the library of service in consulting volumes not obtainable in other libraries.

COLLECTIONS

99366. Archeological and human skeletal material collected in Florida by Henry B. Collins, jr., during January and February, 1928. (133 specimens.)

99553. Lots of potsherds collected on the surface of mounds in the vicinity of Greenville, S. C., during the spring of 1927 by Dr. J. Walter Fewkes.

99554. Small archeological collection purchased by the bureau from R. W. Owen, Philadelphia, Pa. (16 specimens.)

99953. Archeological and human skeletal material collected by H. W. Krieger during the late summer of 1927 in the Columbia and Snake River Valleys. (190 specimens.)

101146. Small collection of archeological specimens from Tennessee secured in the spring of 1928 by Henry B. Collins, jr. (6 specimens.)

101340. Archeological material from two sites in Chaco Canyon, N. Mex., collected during 1927 by Dr. F. H. H. Roberts, jr. (199 specimens.)

101524. Potsherds, stone, and shell objects from a shell mound near Melbourne, Fla., collected by Dr. F. H. H. Roberts, jr. (4 specimens.)

101525. Atlatl spearshafts, sandals, netting, etc., from a cave about 20 miles northeast of El Paso, Tex., collected in May, 1927, by Dr. F. H. H. Roberts, jr. (26 specimens.)

PROPERTY

Office equipment was purchased to the amount of $656.89.

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. She also classified and catalogued 2,323 musical records in the possession of the bureau. Mrs. Frances S. Nichols assisted the editor.

Personnel.—Dr. J. Walter Fewkes retired as chief of the bureau January 15, 1928, but continued on the staff of the bureau as associate anthropologist.

Respectfully submitted.

H. W. Dorsey,
Chief Clerk, Smithsonian Institution.

Dr. C. G. Abbot,
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, 1928:

An appropriation was made by Congress for the support of the system of international exchanges between the United States and foreign countries under the direction of the Smithsonian Institution for the fiscal year 1928 of $46,855, an increase of $595 over the appropriation for the preceding year. This increase in the amount made available for the service was to enable the Institution to advance to the next step in their respective grades such of the exchange employees as were eligible for promotion. In addition to the above, $300 was allotted for printing and binding. The repayments from departmental and other establishments aggregated $5,083.14, making the total resources available for exchange purposes during the year, $52,238.14.

The total number of packages passing through the service was 542,223, a decrease from the number for the preceding year of 48,656. This falling off in the number of packages handled was expected. However, it does not signify that the normal work of the office has slackened to any extent, as the number of packages passing through the service during the preceding fiscal year was the largest since its organization in 1850—the increase being over a hundred thousand packages, while the annual increase usually averages five or ten thousand. The increase in that year was due in great measure, as was explained in last year's report, to the action of the Department of Agriculture in turning over to the exchange office large numbers of small packages for distribution abroad that it formerly transmitted through the mails. That department later discontinued sending the material in question to the Institution.

The total weight of the packages was 594,121 pounds—a gain of 40,996 over the weight of those handled during the preceding twelve months.

The number and weight of the packages of different classes are given in the following table:

	Packages		Weight	
	Sent	Received	Sent	Received
			Pounds	*Pounds*
United States parliamentary documents sent abroad	219,968		99,653	
Publications received in return for parliamentary documents		6,320		23,693
United States departmental documents sent abroad	153,373		163,046	
Publications received in return for departmental documents		5,560		23,002
Miscellaneous scientific and literary publications sent abroad	113,448		196,546	
Miscellaneous scientific and literary publications received from abroad for distribution in the United States		43,554		88,181
Total	486,789	55,434	459,245	134,876
Grand total	542,223		594,121	

In a letter to the American legation in Peking regarding the interchange of governmental documents between China and the United States the Metropolitan Library in Peking, which in 1926 was designated by the Chinese Government as the depository library for all official publications of foreign governments received by China through the International Exchange Service, makes the following statement:

Special mention should be made of the monthly consignments of governmental documents received from the Smithsonian Institution. The Metropolitan Library maintains a reference card catalogue containing general and specific information concerning these publications and endeavors to furnish information to inquirers, either in person or by mail, involving the material over which it has custody.

The official publications of the United States forwarded to China previous to 1926 were scattered in different places. The Library of the Foreign Office, Peking; the Library of the Science Society, Nanking; and the Library of the Chamber of Commerce, Shanghai, are the three places where a portion of these publications are kept. It is hoped that these publications will eventually be concentrated in one large library where a complete file is available for reference and research.

The Metropolitan Library further adds in its letter to the legation:

In writing to the Department of State will you be good enough to convey our high appreciation of the efficient service which the Smithsonian Institution has been rendering to the Metropolitan Library.

The Smithsonian occasionally receives letters from its correspondents testifying to the usefulness of the International Exchange Service and expressing appreciation of the help rendered in diffusing knowledge by distributing scientific and literary publications.

Among such communications received during the past year was one from Mr. George S. Godard, Connecticut State librarian. A part of that letter is given below:

Every time I make a call at your department I am the more impressed with the most important service you and those associated with you in the international exchange service are rendering to the several States, institutions, and others scattered throughout the civilized earth.

As a representative of the State of Connecticut in charge of the State, national, and international exchanges of Connecticut, I wish to again express my thanks for the services you have rendered the good State of Connecticut both in forwarding to others and sending to us.

Another correspondent, the Minister of Guatemala, states that:

It is my privilege to express to the Institution the sincere thanks of the Government of Guatemala for the interest manifested by the useful and abundant material furnished.

As an example of aid rendered by the international exchange service in securing publications on some particular subject, a request was received from a correspondent in London for information as to what America has done toward the important subject of enacting laws to provide for compulsory automobile liability insurance, and the Institution succeeded in procuring quite a number of publications on the subject. In acknowledging their receipt, the correspondent wrote in part as follows:

I have not up to the present time had the opportunity of reading more than a few of the publications sent to me, but I should like to tender you my very sincere thanks for sending me all the reports desired and in addition many other highly interesting articles. I assure you I appreciate your action very much indeed.

There were shipped abroad during the year 2,872 boxes, being an increase of 264 over the number for the preceding year. Of the total number of boxes sent abroad 643 contained full sets of United States official documents for foreign depositories and 2,229 included departmental and other publications for the depositories of partial sets and for miscellaneous correspondents.

Occasionally, as explained in previous reports, it is found more economical to forward packages direct to their destinations by mail than to transmit them in boxes by freight. In addition, quite a number of packages are sent by mail to remote places which can not be reached through the existing agencies. During the year the number of packages thus forwarded was 47,851.

The number of boxes sent to each foreign country during the fiscal year 1928 is given below:

Consignments of exchanges forwarded to foreign countries

Country	Number of boxes	Country	Number of boxes
Albania	4	Latvia	4
Argentina	62	Lithuania	6
Austria	67	Mexico	11
Belgium	71	Netherlands	66
Brazil	48	New South Wales	39
Bulgaria	5	New Zealand	32
British colonies	25	Norway	69
Canada	55	Palestine	69
Chile	29	Peru	23
China	55	Poland	41
Colombia	22	Portugal	21
Costa Rica	21	Queensland	26
Cuba	11	Rumania	14
Czechoslovakia	68	Russia	134
Denmark	54	South Australia	30
Ecuador	2	Spain	37
Egypt	2	Sweden	87
Estonia	17	Switzerland	66
Finland	14	Tasmania	20
France	198	Turkey	4
Germany	357	Union of South Africa	36
Great Britain and Ireland	337	Uruguay	19
Greece	9	Venezuela	15
Hungary	49	Victoria	59
India	68	Western Australia	25
Italy	158	Yugoslavia	18
Jamaica	2		
Japan	91	Total	2,872

FOREIGN DEPOSITORIES OF UNITED STATES GOVERNMENT DOCUMENTS

The number of sets of United States official documents forwarded abroad to certain designated depositories is 105, an increase of 2 during the year—Burma and Bombay having been added to the list of those countries receiving partial sets. The partial set of governmental documents which has been sent to Rumania since 1903 has been increased to a full set.

Shipments of governmental documents to Turkey, which were suspended at the beginning of the World War, have been resumed, the Turkish Government having designated the Ministry of Public Instruction at Angora as the depository.

At the request of the Government of Yugoslavia, the depository of the full set of official documents in that country has been changed from the Ministry of Foreign Affairs to the Ministry of Education at Belgrade.

The depository of governmental publications sent to the Netherlands, at the request of that Government, has been changed from the Library of the Second Chamber of the States General to the Royal Library at The Hague.

The Government of the Commonwealth of Australia, which was temporarily located in Melbourne, has moved into the recently founded city of Canberra. The set of United States governmental documents sent to the Library of the Commonwealth Parliament, therefore, is now being forwarded to that city instead of to Melbourne.

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: Biblioteca 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.
WURTTEMBERG: 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: Royal Library, 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: Biblioteca 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: Ministère de l'Instruction Publique, Angora.
UNION OF SOUTH AFRICA: State Library, Pretoria, Transvaal.
URUGUAY: Oficina de Canje Internacional de Publicaciones, Montevideo.
VENEZUELA: Biblioteca Nacional, Caracas.
YUGOSLAVIA: Ministère de l'Education, Belgrade.

DEPOSITORIES OF PARTIAL SETS

AUSTRIA:
VIENNA: Magistrat der Stadt.
BOLIVIA: Ministerio de Colonización y Agricultura, La Paz.
BRAZIL:
MINAS GERAES: Directoria Geral de Estatistica em Minas, Bello Horizonte, Minas Geraes.
RIO DE JANEIRO: Bibliotheca da Assemblea Legislativa do Estado, Nictheroy.
CANADA:
ALBERTA: Provincial Library, Edmonton.
BRITISH COLUMBIA: Legislative Library, Victoria.
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 Reichs- und Auswärtige Angelegenheiten.
HESSE: Landesbibliothek, Darmstadt.
LÜBECK: President of the Senate.
THURINGIA: Rothenberg-Bibliothek, Landesuniversität, Jena.
GUATEMALA: Secretary of the Government, Guatemala.
HAITI: Secrétaire d'État des Relations Extérieures, Port au Prince.
HONDURAS: Secretary of the Government, Tegucigalpa.
ICELAND: National Library, Reykjavik.
INDIA:
BOMBAY: Undersecretary to the Government of Bombay, General Department, Bombay.
BURMA: Secretary to the Government of Burma, Education Department, Rangoon.
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'État, Riga.
LIBERIA: Department of State, Monrovia.
LITHUANIA: Ministère des Affaires Étrangères, Kovno.
LOURENÇO MARQUEZ: Government Library, Lourenço Marquez.
MALTA: Minister for the Treasury, Valetta.
NEWFOUNDLAND: 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 year, three additional foreign depositories were added to the list of those receiving the daily issue of the Congressional Record, the depositories being located in Brazil, Irish Free State, and Turkey.

The two chambers of the National Congress of Spain having been superceded by a national assembly with but one chamber, only one copy of the Record is now forwarded to the Spanish Legislature instead of two. The total number of establishments receiving copies of the daily issue of the Congressional Record is 101.

A complete list of the countries now taking part in this exchange 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, Manáos.
Bahia: Governador do Estado de Bahia, São Salvador.
Espirito Santo: Presidencia do Estado do Espirito Santo, Victoria.
Sergipe: Director da Imprensa Official, Aracaju, Estado de Sergipe.
São Paulo: Bibliotheca Publica do Estado de São Paulo, São Paulo.

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.

GERMANY—Continued.
Prussia: Bibliothek des Abgeordnetenhauses, Prinz-Albrechtstrasse 5, Berlin, S. W. 11.
Schaumburg-Lippe: Schaumburg-Lippische Landesregierung, Bücheburg.
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'État 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).
IRISH FREE STATE: Dail Eireann, Dublin.
LATVIA: Library of the Saeima, Riga.
LIBERIA: Department of State, Monrovia.
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.
Sonora: Gobernador del Estado de Sonora, Hermosillo.
Tabasco: Secretaría General de Gobierno, Sección 3a, Ramo de Prensa, Villahermosa.
Tamaulipas: Secretaría 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: Biblioteca do Congresso da Republica, Lisbon.
RUMANIA:
Bibliothèque de la Chambre des Députés, Bucharest.
Ministère des Affaires Étrangères, Bucharest.
SPAIN:
Biblioteca de la Asamblea Nacional, 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.
TURKEY: Turkish Grand National Assembly, Angora.
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

The Italian Office of International Exchanges, which since its organization had been under the direction of the Victor Emanuel National Library in Rome, was during the latter part of the year placed under the ministry of public instruction.

The Dutch Central Scientific Bureau, which for many years conducted the exchange agency for the Netherlands and was under the direction of various scientific organizations, was made, on January 1, 1928, a subdivision of the Federal organization and placed under the direction of the Royal Library at The Hague. Information has been received from the latter to the effect that the name and address of the agency is now International Exchange Bureau of the Netherlands, Royal Library, Kazernestraat, The Hague. A list of the foreign exchange agencies or bureaus is given below:

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 Échanges Internationaux, Rue des Longs-Chariots, 46, Brussels.

BOLIVIA: Oficina Nacional de Estadistica, La Paz.
BRAZIL: Servicio 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 Tchécoslovaque 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: Hungarian Libraries Board, Budapest, IV.
ICELAND, via Denmark.
INDIA: Superintendent of Stationery, Bombay.
ITALY: R. Ufficio degli Scambi Internazionali, Ministero della Pubblica Istruzione, 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.
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MADEIRA, via Portugal.
MOZAMBIQUE, via Portugal.

NETHERLANDS: International Exchange Bureau of the Netherlands, Royal Library, 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, Asuncion.
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: Secção de Trocas Internacionaes, Biblioteca 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, Caracas.
VICTORIA: Public Library of Victoria, Melbourne.
WESTERN AUSTRALIA: Public Library of Western Australia, Perth.
YUGOSLAVIA: Ministère des Affaires Étrangères, Belgrade.

Dr. Charles G. Abbot, who on his appointment December 16, 1918, as Assistant Secretary of the Institution, was, among other duties, assigned to the general charge of the international exchanges, has retained supervision over the exchanges since his election as Secretary of the Smithsonian Institution on January 10, 1928.

Respectfully submitted.

C. W. SHOEMAKER,
Chief Clerk, International Exchange Service.

Dr. CHARLES G. ABBOT,
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, 1928. The appropriation made by Congress for the regular maintenance of the park was $175,000, and there was the usual allotment of $300 for printing and binding. Of the appropriation, $126,000 was expended for salaries and labor in connection with the maintenance of the park; $22,800 for food for animals; and $4,701 for coal.

There has been no important increase in the collection of animals, though a number of species new to the collection have been added.

ACCESSIONS

Gifts.—There were added to the collection by gift or deposit 138 specimens from 87 different donors. Notable among the gifts are a shoebill stork and two red birds of paradise which were purchased from the Chrysler fund. Mrs. James Cox Brady, of New York City, presented a flock of six of the beautiful Forsten's parrakeets. Col. H. A. Shumaker, of McElhattan, Pa., presented three plains wolves, a pair of which have since bred in the park.

From the United States Biological Survey, through its chief, Mr. Paul G. Redington, the park obtained a beautiful specimen of the young Kadiak bear. The acquisition of young animals is of great importance, for although the national collection is one of the most notable, many of the animals are now very old. The Yakatat bear, for instance, has been here 28 years, and young specimens, especially of the Alaskan species, are highly desirable.

Through Dr. H. C. Kellers, United States Navy, now on duty with the Marine Corps in Nicaragua, the park has received two original collections of Central American birds and animals, among them toucans, a cage of spider monkeys, and a cage of coatimundis, all of which make attractive exhibits.

DONORS

Mrs. Ethel E. Allicoate, Washington, D. C., screech owl.
American Nature Association, Washington, D. C., two European flamingoes.
Mrs. Anne Archbold, Washington, D. C., one kinkajou.
Miss Helen Louise Baldwin, Chevy Chase, Md., horned toad.

Mr. Thomas Barbour, Cambridge, Mass., musk turtle, box turtle, two spotted turtles.

Mrs. A. A. Beck, Washington, D. C., grass parrakeet.

Mr. H. S. Bickel, Brunswick, Md., two alligators.

Mr. John S. C. Boswell, Alexandria, Va., four-lined snake.

Mr. Roy M. Bott, Washington, D. C., black snake.

Miss Betty Bowman, Germantown, Md., kinkajou.

Mrs. James Cox Brady, New York City, six Forsten's parrakeets.

Mrs. Robert Callow, Washington, D. C., Cuban parrot.

Mr. F. G. Carnochan, New York City, wood tortoise, mynah bird.

Mr. M. O. Castleman, Castlemans Ferry, Va., woodchuck.

Mrs. Fred K. Chapin, Washington, D. C., two finches.

Mr. W. P. Chrysler, Detroit, Mich., shoe-bill stork, two birds of paradise.

Mr. F. M. Clark, Washington, D. C., red fox.

Mrs. E. Cocksell, Washington, D. C., double-yellow-head parrot.

President Coolidge, White House, bald eagle.

Dr. T. B. Cracroft, Washington, D. C., horned toad.

Mr. C. W. Cramer, Morgantown, W. Va., three banded rattlesnakes.

Mr. C. E. Cummings, Buffalo, N. Y., six hellbenders.

Mr. H. A. Daniel, Orange, Va., red-tailed hawk.

Señor don Pedro Domian, Limon, Costa Rica, two Costa Rica deer.

Lieut. Commander G. W. Dugger, United States Navy, alligator.

Major Erwin, Washington, D. C., gray fox.

Mrs. N. Floyd, jr., Garden City, N. Y., douroucouli.

Mr. C. W. Gaines, horned toad.

Mr. R. D. Harrison, Alexandria, Va., alligator.

Mr. Stephen Haweis, Washington, D. C., two monk parrakeets.

Mr. C. A. Henderson, Washington, D. C., great horned owl.

Mr. Albert Hochbaum, Takoma Park, D. C., barrel owl.

Horne's Zoological Arena Co., Kansas City, Mo., vervet monkey.

Mr. James Hyslop, Silver Spring, Md., copperhead.

Miss Elsie Jardine, Washington, D. C., bull snake.

Mr. L. W. Keesling, Bristol, Va., two skunks.

Dr. H. C. Kellers, United States Navy, Fifth Brigade, Managua, Nicaragua, three gray spider monkeys, two gray coatimundis, agouti, lemon-breasted toucan, two tovi parrakeets, white-throated capuchin.

Mr. John H. Kennard, Newton Center, Mass., Gila monster.

Mr. J. R. King, Takoma Park, Md., rhesus monkey.

Mrs. D. W. Knowlton, Washington, D. C., white Pekin duck.

Mr. Preston Laflin, High Point, N. C., great blue heron.

Mr. J. C. Lannam, Calderwood, Tex., black snake.

Mr. S. J. La Scola, Washington, D. C., alligator.

Mr. G. C. Leach, Bureau of Fisheries, Washington, D. C., opossum.

Mr. Harrison Lee, Bastian, Va., banded rattlesnake.

Mr. R. S. Lindamood, Salem, Va., two American black bears.

Mrs. William M. Mann, Washington, D. C., two nanday parrakeets.

Miss Mary Marsh, Chevy Chase, Md., red fox.

Mr. M. E. Musgrave, Phoenix, Ariz., puma, Bailey's lynx, Berlandier's tortoise.

Mrs. B. H. Myers, Washington, D. C., two white-tailed jack rabbits.

National Park Service, Grand Canyon, Ariz., Gila monster.

Mrs. Rose V. Nolte, Washington, D. C., double-yellow-head parrot.

Mrs. W. P. Norfolk, two brown capuchins.

Mrs. R. B. Patterson, Washington, D. C., alligator.

Pearson & Hauke, Clifton, Tex., red-tailed hawk.

Hon. Gifford Pinchot, Washington, D. C., yellow and blue macaw.

Mr. Paul G. Redington, Chief U. S. Bureau of Biological Survey, Washington, D. C., Kadiak bear.

Mr. E. B. Reid, Culpeper, Va., gray fox.

Mr. E. D. Reid, National Museum, black snake.

Lieut. E. J. Richards, United States Navy, rosella parrakeet.

Mr. Siegfried Scharbau, Washington, D. C., crimson-headed parrot.

Mr. Charles Shelby, Washington, D. C., American black bear.

Mr. H. A. Shumaker, McElhattan, Pa., and New York City, three plains wolves.

Mr. M. B. Slemmer, Centerville, Md., alligator.

Miss Stella Snell, New York City, canary.

Mrs. Sockrell, Washington, D. C., red-tailed hawk.

Mr. J. H. Stieg, Washington, D. C., osprey.

Mr. Robert F. Taylor, Washington, D. C., raccoon.

Mrs. Thomas, Garrett Park, Md., copperhead.

Miss Frances Tooke, Washington, D. C., opossum.

Mr. B. R. Torrance, Silver Spring, Md., three skunks.

Mr. G. Townsend, Colonial Beach, Va., great horned owl.

Mrs. E. M. Tracy, Washington, D. C., two coyotes.

United States Biological Survey, through Stanley G. Jewett, Portland, Oreg., albino coyote.

United States Coast Guard, New London, Conn., black bear.

United States Marine Corps, through Dr. H. C. Kellers, United States Navy, three gray spider monkeys, two gray coatimundis, agouti, lemon-breasted toucan, two tovi parrakeets, white-throated capuchin.

United States National Museum, Washington, D. C., coach-whip snake.

Miss Mabel Van Alstyne, New Rochelle, N. Y., red-fronted parrakeet.

Mr. G. H. Vega, Fort Humphreys, Va., gray fox.

Mr. A. E. Vinsen, Port au Prince, Haiti, Haitian snake.

Mr. C. T. Vorhies, Tucson, Ariz., three Gila monsters.

Mr. Edward White, Washington, D. C., two alligators.

Mr. W. L. Whiting, Takoma Park, Md., raccoon.

Mr. J. S. Williams, Widewater, Va., green guenon.

Mr. W. C. Williams, Franklin, Tenn., banded rattlesnake.

Unknown donors, great blue heron, turkey vultures, broad-winged hawk, two alligators.

The office of the Chief Coordinator has again transferred certain useful and appreciated equipment and supplies to the park.

Births.—Among the births of the park this year have been yak, tahr, American elk, Alpine ibex, mouflon, barasingha deer, hog deer, fallow deer, red deer, Sika deer, bison, mountain sheep, llama, gray wolves, aoudads, wart hogs, agouti, rhesus monkey, and leopards. Both pairs of leopards secured by the Smithsonian-Chrysler expedition mated in the zoo and each produced a litter of two cubs, which are doing well. An American white pelican was raised in the pelican pond near the Harvard Street entrance, which is the first breeding record of this bird in captivity, and two more blue geese have been hatched. The herd of Rocky Mountain sheep was augmented by

2 lambs, and at the close of the year there were 10 individuals—8 born in the park and 4 of them grandchildren.

Exchanges.—The most important of the animals received in exchange were a mate to the Mongolian wild horse which we already had, a pair of South African big-eared foxes, and a collection of eight species of lories.

Purchases.—The principal purchases of the year were a young South African buffalo; an inyala, the first of its kind to reach America; a pair of brown hyena, also unique of their kind in America; three wolverines secured by Dr. W. H. Chase, of Cordova, Alaska; a rhinoceros hornbill; and a hyacinthine macaw.

La Société Nationale d'Acclimatation de France during the year awarded the park its medal in recognition of the raising of the blue goose.

Removals.—Losses by death include the two giraffes, Hi-boy and Dot, both of which died of nephritis with complications. Other serious losses are a Kadiak bear, which had lived in the park from December 15, 1903, to August 28, 1927; white-tailed gnu, arrived June 23, 1914, died November 21, 1927; a sambar deer, received May 22, 1912, died January 2, 1928; our last cheetah, which had arrived August 8, 1913, died September 6, 1927; an American bison, born in the zoo May 24, 1907, died September 4, 1927; jaguar, arrived May 1, 1915, died June 28, 1928; European black stork, arrived May 18, 1902, died May 13, 1928; West African crowned crane, arrived May 25, 1905, died February 21, 1928; gila monster, received September 21, 1910, died January 11, 1928; anaconda, received August 17, 1899, died August 26, 1927.

The long life of the cheetah is a record for an individual of its species living in the North, and the anaconda, having lived for 28 years in the park, provides a most notable record for longevity of this snake, which is usually not hardy in captivity.

The loss in the reptile collection has been great, as we have no suitable quarters for them.

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:

CAUSES OF DEATH

MAMMALS

Carnivora: Acute peritonitis, 1; intestinal obstruction, 1; gastritis, 2.

Primates: Chronic nephritis, 1; pneumonia, 5; gastroenteritis, 3; cachexia senilis, 1.

Artiodactyla: Nephritis, 2; gastroenteritis, 1; septic metritis, 1; pneumonia, 3; old age, 1.

Rodentia: Pneumonia, 1.

BIRDS

Sphenisciformes: Peritonitis, 1.
Ciconiiformes: Ruptured liver, 1; edema of heart, 1.
Charadriiformes: Pneumonia, 1.
Coraciiformes: Aspergillosis, 1.
Psittaciformes: Acute enteritis, 1.

The animals lost by death which were valuable for museum purposes were transferred to the United States National Museum for preservation. A number of rare birds' eggs were also sent to the Museum.

A few mammals especially desired by the department of anatomy of the Johns Hopkins Medical School were sent, after death, to that institution.

ANIMALS IN THE COLLECTION JUNE 30, 1928

MAMMALS

MARSUPIALIA

Virginia opossum (*Didelphis virginiana*)	4
Flying phalanger (*Petaurus breviceps*)	5
Bush-tailed rock wallaby (*Petrogale penicillata*)	1
Wallaroo (*Macropus robustus*)	2
Wombat (*Phascolomys mitchelli*)	1

CARNIVORA

Kadiak bear (*Ursus middendorffi*)	2
Alaska Peninsula bear (*Ursus gyas*)	4
Yakutat bear (*Ursus dalli*)	1
Kidder's bear (*Ursus kidderi*)	2
European bear (*Ursus arctos*)	7
Grizzly bear (*Ursus horribilis*)	1
Apache grizzly (*Ursus apache*)	1
Himalayan bear (*Ursus thibetanus*)	1
Black bear (*Euarctos americanus*)	7
Cinnamon bear (*Euarctos americanus cinnamomum*)	4
Glacier bear (*Euarctos emmonsii*)	1
Sun bear (*Helarctos malayanus*)	1
Polar bear (*Thalarctos maritimus*)	2
Dingo (*Canis dingo*)	2
Gray wolf (*Canis nubilus*)	13
Florida wolf (*Canis floridanus*)	1
Texas red wolf (*Canis rufus*)	1
Coyote (*Canis latrans*)	5
Hybrid coyote (*Canis latrans-rufus*)	4
California coyote (*Canis ochropus*)	1
Black-backed jackal (*Thos mesomelas*)	1
Fennec (*Fennecus zerda*)	2
Rough fox (*Cerdocyon cancrivorus*)	2
Red fox (*Vulpes fulva*)	7
Silver-black fox (*Vulpes fulva*)	1
European fox (*Vulpes vulpes*)	1
Kit fox (*Vulpes velox*)	2
Gray fox (*Urocyon cinereoargenteus*)	5
Bush dog (*Icticyon venaticus*)	1
Cacomistle (*Bassariscus astutus*)	1
Raccoon (*Procyon lotor*)	16
Florida raccoon (*Procyon lotor elucus*)	1
Gray coatimundi (*Nasua narica*)	4
Kinkajou (*Potos flavus*)	2
Mexican kinkajou (*Potos flavus aztecus*)	1
Fisher (*Martes pennanti*)	1
Skunk (*Mephitis nigra*)	7
Wolverine (*Gulo luscus*)	3
American badger (*Taxidea taxus*)	2
Ratel (*Mellivora capensis*)	1
Florida otter (*Lutra canadensis vaga*)	2
Indian civet (*Viverra zibetha*)	1
Palm civet (*Paradoxurus hermaphroditus*)	1
Egyptian mongoose (*Herpestes ichneumon*)	1
Neumann's genet (*Genetta dongalana neumanni*)	5
Aard-wolf (*Proteles cristatus*)	1
Spotted hyena (*Crocuta crocuta*)	1
East African spotted hyena (*Crocuta crocuta germinans*)	5
Striped hyena (*Hyæna hyæna*)	1
Brown hyena (*Hyæna brunnea*)	2
Lion (*Felis leo*)	5
Bengal tiger (*Felis tigris*)	1
Manchurian tiger (*Felis tigris longipilis*)	3
Leopard (*Felis pardus*)	1
Black leopard (*Felis pardus*)	1
East African leopard (*Felis pardus suahelicus*)	8
Serval (*Felis serval*)	1
East African serval (*Felis capensis hindei*)	2
Ocelot (*Felis pardalis*)	2
Brazilian ocelot (*Felis pardalis brasiliensis*)	1
Gray tiger-cat (*Felis chrysothrix*)	1
Mexican puma (*Felis azteca*)	4

Mountain lion (*Felis hippolestes*)	1
Yaguarundi (*Felis yagouaroundi*)	1
Indian caracal (*Lynx caracal*)	1
Abyssinian caracal (*Lynx caracal nubica*)	1
Canada lynx (*Lynx canadensis*)	1
Bay lynx (*Lynx rufus*)	3
Bailey's lynx (*Lynx baileyi*)	1
Clouded leopard (*Neofelis nebulosa*)	1

PINNIPEDIA

California sea-lion (*Zalophus californianus*)	1
Leopard seal (*Phoca richardii var.*)	2
San Geronimo harbor seal (*Phoca richardii geronimensis*)	1

RODENTIA

Woodchuck (*Marmota monax*)	7
Prairie dog (*Cynomys ludovicianus*)	11
Albino squirrel (*Sciurus carolinensis*)	2
American beaver (*Castor canadensis*)	2
East African porcupine (*Hystrix galeata*)	2
Malay porcupine (*Acanthion brachyurum*)	2
Viscacha (*Lagostomus trichodactylus*)	1
Central American paca (*Cuniculus paca virgatus*)	4
Trinidad agouti (*Dasyprocta rubrata*)	4
Guinea pig (*Cavia porcellus*)	10

LAGOMORPHA

Domestic rabbit (*Oryctolagus cuniculus*)	10

INSECTIVORA

European hedgehog (*Erinaceus europæus*)	1

PRIMATES

Zanzibar lemur (*Galago garnetti*)	1
Red-fronted lemur (*Lemur rufifrons*)	1
Black lemur (*Lemur macaco*)	1
Douroucouli (*Aotus trivirgatus*)	1
Gray spider monkey (*Ateles geoffroyi*)	7
White-throated capuchin (*Cebus capucinus*)	2
Brown capuchin (*Cebus fatuellus*)	1
Margarita capuchin (*Cebus margaritæ*)	1
Chacma (*Papio porcarius*)	2
Anubis baboon (*Papio cynocephalus*)	6
Olive baboon (*Papio neumanni*)	3
Hamadryas baboon (*Papio hamadryas*)	1
Mandrill (*Papio sphinx*)	3
Drill (*Papio leucophæus*)	1
Moor monkey (*Cynopithecus maurus*)	3
Black ape (*Cynopithecus niger*)	1
Barbary ape (*Simia sylvanus*)	2
Japanese macaque (*Macaca fuscata*)	3
Brown macaque (*Macaca arctoides*)	1
Pig-tailed monkey (*Macaca nemestrina*)	1
Burmese macaque (*Macaca andamanensis*)	1
Rhesus monkey (*Macaca rhesus*)	7
Crab-eating macaque (*Macaca irus*)	1
Philippine macaque (*Macaca syrichta*)	2
Javan macaque (*Macaca mordax*)	3
Sooty mangabey (*Cercocebus fuliginosus*)	3
Green guenon (*Lasiopyga callitrichus*)	2
Vervet (*Lasiopyga pygerythra*)	1
Johnston's vervet (*Lasiopyga pygerythra johnstoni*)	5
Mozambique monkey (*Lasiopyga* sp.)	2
Sykes' guenon (*Lasiopyga albigularis*)	5
Mona guenon (*Lasiopyga mona*)	2
De Brazza's guenon (*Lasiopyga brazzæ*)	1
Lesser white-nosed guenon (*Lasiopyga petaurista*)	1
Patas guenon (*Erythrocebus patas*)	1
White-handed gibbon (*Hylobates lar*)	1
Gray gibbon (*Hylobates leuciscus*)	1
Chimpanzee (*Pan satyrus*)	2
Orang-utan (*Pongo pygmæus*)	1

ARTIODACTYLA

Wart hog (*Phacochœrus æthiopicus*)	3
River hog (*Potamochœrus africanus*)	4
Collared peccary (*Pecari angulatus*)	2
Hippopotamus (*Hippopotamus amphibius*)	2
Pigmy hippopotamus (*Chœropsis liberiensis*)	1
Bactrian camel (*Camelus bactrianus*)	1
Arabian camel (*Camelus dromedarius*)	1
Guanaco (*Lama huanachus*)	2
Llama (*Lama glama*)	6
Reindeer (*Rangifer tarandus*)	9
Fallow deer (*Dama dama*)	10
White fallow deer (*Dama dama*)	1
Axis deer (*Axis axis*)	2
Hog deer (*Hyelaphus porcinus*)	5
Barasingha (*Rucervus duvaucelii*)	6
Burmese deer (*Rucervus eldii*)	1
Japanese deer (*Sika nippon*)	12
Red deer (*Cervus elaphus*)	15
Kashmir deer (*Cervus hanglu*)	2
Bedford deer (*Cervus xanthopygus*)	5
American elk (*Cervus canadensis*)	5
Costa Rican deer (*Odocoileus sp.*)	2
Guatemala deer (*Odocoileus sp.*)	1
Mule deer (*Odocoileus hemionus*)	3
Blesbok (*Damaliscus albifrons*)	1
White-tailed gnu (*Connochætes gnu*)	1
Brindled gnu (*Connochætes taurinus*)	1
White-bearded gnu (*Connochætes taurinus albojubatus*)	2
Lechwe (*Onotragus leche*)	1
Inyala (*Tragelaphus angasi*)	1
Sable antelope (*Egocerus niger*)	1

Reed buck (*Redunca bohor*)	1
East African impalla (*Æpyceros melampus suara*)	2
Indian antelope (*Antilope cervicapra*)	2
Nilgai (*Boselaphus tragocamelus*)	2
Mountain goat (*Oreamnos americanus*)	3
Tahr (*Hemitragus jemlahicus*)	10
Alpine ibex (*Capra ibex*)	2
Aoudad (*Ammotragus lervia*)	3
Rocky Mountain sheep (*Ovis canadensis*)	11
Mouflon (*Ovis europæus*)	7
Greenland musk-ox (*Ovibos moschatus wardi*)	1
Zebu (*Bos indicus*)	1
Yak (*Poëphagus grunniens*)	6
American bison (*Bison bison*)	14
Anoa (*Anoa depressicornis*)	1
Indian buffalo (*Bubalus bubalis*)	2

PERISSODACTYLA

Malay tapir (*Tapirus indicus*)	1
Brazilian tapir (*Tapirus terrestris*)	1
Baird's tapir (*Tapirella bairdii*)	1
Mongolian horse (*Equus przewalskii*)	2
Mountain zebra (*Equus zebra*)	2
Chapman's zebra (*Equus quagga chapmani*)	2
Zebra-horse hybrid (*Equus grevyi-caballus*)	1
Zebra-ass hybrid (*Equus grevyi-asinus*)	1

PROBOSCIDEA

Abyssinian elephant (*Loxodonta africana oxyotis*)	1
Sumatran elephant (*Elephas sumatranus*)	1

BIRDS

STRUTHIONIFORMES

South African ostrich (*Struthio australis*)	3
Somaliland ostrich (*Struthio molybdophanes*)	1
Nubian ostrich (*Struthio camelus*)	1

RHEIFORMES

Rhea (*Rhea americana*)	1

CASUARIIFORMES

Australian cassowary (*Casuarius australis*)	1
Single-wattled cassowary (*Casuarius uniappendiculatus*)	1
Sclater's cassowary (*Casuarius philipi*)	1
Emu (*Dromiceius novæhollandiæ*)	2

CICONIIFORMES

American white pelican (*Pelecanus erythrorhynchos*)	9
European white pelican (*Pelecanus onocrotalus*)	2
Roseate pelican (*Pelecanus roseus*)	1
Australian pelican (*Pelecanus conspicillatus*)	2
Brown pelican (*Pelecanus occidentalis*)	6
California brown pelican (*Pelecanus californicus*)	5
Florida cormorant (*Phalacrocorax auritus floridanus*)	2
Brandt's cormorant (*Phalacrocorax penicillatus*)	1
Great white heron (*Ardea occidentalis*)	1
Great blue heron (*Ardea herodias*)	3
Hybrid great blue and white heron (*Ardea herodias-occidentalis*)	1
Goliath heron (*Ardea goliath*)	1
East African heron (*Ardea melanocephala*)	1
Black-crowned night heron (*Nycticorax nycticorax nævius*)	79
Boatbill (*Cochlearius cochlearius*)	1
White-necked stork (*Dissura episcopus*)	2
Indian adjutant (*Leptoptilus dubius*)	2
Shoe-bill (*Balæniceps rex*)	1
Wood ibis (*Mycteria americana*)	1
Sacred ibis (*Threskiornis æthiopicus*)	1
Black-headed ibis (*Threskiornis melanocephalus*)	3
White ibis (*Guara alba*)	8
Scarlet ibis (*Guara rubra*)	3
European flamingo (*Phœnicopterus roseus*)	1

ANSERIFORMES

Mallard (*Anas platyrhynchos*)	26
Black duck (*Anas rubripes*)	7
Australian black duck (*Anas superciliosa*)	1
Gadwall (*Chaulelasmus streperus*)	12
Falcated teal (*Eunetta falcata*)	1
European widgeon (*Mareca penelope*)	3
Baldpate (*Mareca americana*)	7
Green-winged teal (*Nettion carolinense*)	3
European teal (*Nettion crecca*)	4
Baikal teal (*Nettion formosum*)	5
Blue-winged teal (*Querquedula discors*)	1
Garganey (*Querquedula querquedula*)	6
Shoveller (*Spatula clypeata*)	1
African pintail (*Dafila erythrorhyncha*)	2
Pintail (*Dafila acuta*)	11
Wood duck (*Aix sponsa*)	8
Mandarin duck (*Dendronessa galericulata*)	8
Canvasback (*Marila valisineria*)	7
European pochard (*Marila ferina*)	3
Redhead (*Marila americana*)	11
Ring-necked duck (*Marila collaris*)	2
Tufted duck (*Marila fuligula*)	1
Lesser scaup duck (*Marila affinis*)	1
Greater scaup duck (*Marila marila*)	3

Rosy-billed pochard (*Metopiana peposaca*) 4
Egyptian goose (*Chenalopex ægyptiacus*) 1
Hawaiian goose (*Nesochen sandvicensis*) 2
Blue goose (*Chen cærulescens*) 7
White-fronted goose (*Anser albifrons*) 4
American white-fronted goose (*Anser albifrons gambeli*) 1
Bean goose (*Anser fabalis*) 2
Pink-footed goose (*Anser brachyrhynchus*) 2
Chinese goose (*Cygnopsis cygnoides*) 3
Bar-headed goose (*Eulabeia indica*) 2
Canada goose (*Branta canadensis*) 9
Hutchins's goose (*Branta canadensis hutchinsii*) 3
White-cheeked goose (*Branta canadensis occidentalis*) 15
Cackling goose (*Branta canadensis minima*) 2
Brant (*Branta bernicla glaucogastra*) 10
Barnacle goose (*Branta leucopsis*) 4
Emperor goose (*Philacte canagica*) 1
Spur-winged goose (*Plectropterus gambensis*) 4
Muscovy duck (*Cairina moschata*) 3
Black-bellied tree duck (*Dendrocygna autumnalis*) 1
Eyton's tree duck (*Dendrocygna eytoni*) 5
Mute swan (*Cygnus gibbus*) 1
Whistling swan (*Cygnus columbianus*) 1
Black swan (*Chenopis atrata*) 4

FALCONIFORMES

Condor (*Vultur gryphus*) 1
California condor (*Gymnogyps californianus*) 3
Turkey vulture (*Cathartes aura*) 6
Black vulture (*Coragyps urubu*) 1
King vulture (*Sarcoramphus papa*) 2
Secretary bird (*Sagittarius serpentarius*) 1
Griffon vulture (*Gyps fulvus*) 1
African black vulture (*Torgos tracheliotus*) 1
Cinereous vulture (*Ægypius monachus*) 2
White-headed vulture (*Trigonoceps occipitalis*) 1
Caracara (*Polyborus cheriway*) 3
Wedge-tailed eagle (*Uroaëtus audax*) 2
Golden eagle (*Aquila chrysaëtos*) 4
Tawny eagle (*Aquila rapax*) 2
Bald eagle (*Haliæetus leucocephalus leucocephalus*) 10
Alaskan bald eagle (*Haliæetus leucocephalus alascanus*) 2
Red-tailed hawk (*Buteo borealis*) 12
Broad-winged hawk (*Buteo platypterus*) 1
East African chanting goshawk (*Melierax poliopterus*) 1
Pigmy falcon (*Poliohierax semitorquatus*) 1
Sparrow hawk (*Falco sparverius*) 3
Osprey (*Pandion haliaëtus carolinensis*) 2

GALLIFORMES

Panama curassow (*Crax panamensis*) 2
Spix's wattled curassow (*Crax globulosa*) 3
Razor-billed curassow (*Mitu mitu*) 2
Crested guan (*Penelope boliviana*) 1
Chestnut-winged guan (*Ortalis garrula*) 1
Vulturine guinea fowl (*Acryllium vulturinum*) 2
Grant's crested guinea fowl (*Guttera granti*) 1
Reichenow's helmeted guinea fowl (*Numida mitrata reichenowi*) 12
Peafowl (*Pavo cristatus*) 10
Albino peafowl (*Pavo cristatus*) 4
Javan jungle fowl (*Gallus varius*) 2
Argus pheasant (*Argus giganteus*) 2
Silver pheasant (*Gennæus nycthemerus*) 2
Edward's pheasant (*Gennæus edwardsi*) 1
Golden pheasant (*Chrysolophus pictus*) 5
Lady Amherst's pheasant (*Chrysolophus amherstiæ*) 1
Ring-necked pheasant (*Phasianus torquatus*) 11
Migratory quail (*Coturnix coturnix*) 10
Valley quail (*Lophortyx californica vallicola*) 1
Scaled quail (*Callipepla squamata*) 4
Crowned wood partridge (*Rollulus cristatus*) 2

GRUIFORMES

Florida gallinule (*Gallinula chloropus galeata*) 1
East Indian gallinule (*Porphyrio calvus*) 1
Pukeko (*Porphyrio stanleyi*) 1
Black-tailed moor hen (*Microtribonyx ventralis*) 2
American coot (*Fulica americana*) 1
African moor hen (*Fulica cristata*) 4
African black crake (*Limnocrax flavirostra*) 1
Lesser rail (*Hypotænidia philippensis*) 2
South Island weka rail (*Ocydromus australis*) 2
Short-winged weka (*Ocydromus brachypterus*) 2
Sandhill crane (*Megalornis mexicana*) 4
Little brown crane (*Megalornis canadensis*) 3
White-necked crane (*Megalornis leucauchen*) 1

Indian white crane (*Megalornis leucogeranus*) 1
Lilford's crane (*Megalornis lilfordi*) 1
Australian crane (*Mathewsena rubicunda*) 2
Demoiselle crane (*Anthropoides virgo*) 3
East African crowned crane (*Balearica regulorum gibbericeps*) 5
Kagu (*Rhynochetos jubatus*) 2

CHARADRIIFORMES

Ruff (*Philomachus pugnax*) 3
South American stone plover (*Œdicnemus bistriatus vocifer*) 1
Pacific gull (*Gabianus pacificus*) 1
Great black-backed gull (*Larus marinus*) 2
Western gull (*Larus occidentalis*) 6
Herring gull (*Larus argentatus*) 3
Silver gull (*Larus novæhollandiæ*) 30
Laughing gull (*Larus atricilla*) 2
Inca tern (*Noddi inca*) 1
Victoria crowned pigeon (*Goura victoria*) 1
Nicobar pigeon (*Calœnas nicobarica*) 2
Bronze-wing pigeon (*Phaps chalcoptera*) 2
Bleeding-heart dove (*Gallicolumba luzonica*) 9
Wood pigeon (*Columba palumbus*) 7
Triangular spotted pigeon (*Columba guinea*) 3
Fiji Island pigeon (*Janthoenas vitiensis*) 1
Mourning dove (*zenaidura macroura carolinensis*) 1
Mexican dove (*Zenaidura graysoni*) 1
White-fronted dove (*Leptotila fulviventris brachyptera*) 4
Necklace dove (*Spilopelia tigrina*) 3
Emerald-spotted dove (*Turtur chalcospilos*) 22
Ringed turtledove (*Streptopelia risoria*) 5
East African ring-necked dove (*Streptopelia capicola tropica*) 31
Masai mourning dove (*Streptopelia decipiens perspicillata*) 12
Zebra dove (*Geopelia striata*) 3
Bar-shouldered dove (*Geopelia humeralis*) 1
Cape masked dove (*Œna capensis*) 12
Inca dove (*Scardafella inca*) 1
Cuban ground dove (*Chœmepelia passerina aflavida*) 1
Pacific fruit pigeon (*Globicera pacifica*) 1
Bronze fruit pigeon (*Muscadivores œnca*) 1

PSITTACIFORMES

Kea (*Nestor notabilis*) 1
Violet-necked lory (*Eos variegata*) 2
Forsten's lorikeet (*Trichoglossus forsteni*) 4
Great black cockatoo (*Microglossus aterrimus*) 1
Roseate cockatoo (*Kakatoe roseicapilla*) 13
Bare-eyed cockatoo (*Kakatoe gymnopis*) 1
Leadbeater's cockatoo (*Kakatoe leadnopis*) 1
White cockatoo (*Kakatoe alba*) 1
Sulphur-crested cockatoo (*Kakatoe galerita*) 6
Great red-crested cockatoo (*Kakatoe moluccensis*) 1
Mexican green macaw (*Ara militaris mexicana*) 2
Severe macaw (*Ara severa*) 1
Blue and yellow macaw (*Ara ararauna*) 9
Red and blue and yellow macaw (*Ara macao*) 4
Illiger's macaw (*Ara maracana*) 2
Hyacinthine macaw (*Anodorhynchus hyacinthinus*) 1
Blue-winged conure (*Pyrrhura picta*) 2
Nanday paroquet (*Nandayus nenday*) 3
Gray-breasted paroquet (*Myopsitta monachus*) 3
Petz's paroquet (*Eupsittula canicularis*) 5
Golden-crowned paroquet (*Eupsittula aurea*) 2
Weddell's paroquet (*Eupsittula weddellii*) 3
Blue-winged parrotlet (*Psittacula passerina*) 12
Golden paroquet (*Brotogeris chrysosema*) 1
Tovi paroquet (*Brotogeris jugularis*) 4
Yellow-naped parrot (*Amazona auropalliata*) 2
Mealy parrot (*Amazona farinosa*) 1
Orange-winged parrot (*Amazona amazonica*) 5
Blue-fronted parrot (*Amazona æstiva*) 1
Red-crowned parrot (*Amazona viridigenalis*) 4
Double-yellow-head parrot (*Amazona oratrix*) 13
Yellow-headed parrot (*Amazona ochrocephala*) 7
Festive parrot (*Amazona festiva*) 3
Lesser white-fronted parrot (*Amazona albifrons nana*) 1
Santo Domingo parrot (*Amazona ventralis*) 3
Cuban parrot (*Amazona leucocephala*) 6
Maximilian's parrot (*Pionus maximiliani*) 1
Dusky parrot (*Pionus fuscus*) 1
Blue-headed parrot (*Pionus menstruus*) 1
Amazonian caique (*Pionites xanthomera*) 3
Hawk-head parrot (*Deroptyus accipitrinus*) 1

Yellow-fronted parrot (*Poicephalus flavifrons*) 1
East African brown parrot (*Poicephalus meyeri matschiei*) 2
Congo parrot (*Poicephalus gulielmi*) 1
Lesser vasa parrot (*Coracopsis nigra*) 1
Greater vasa parrot (*Coracopsis vasa*) 1
Red-faced love bird (*Agapornis pullaria*) 7
Gray-headed love bird (*Agapornis madagascariensis*) 8
Yellow-collared love bird (*Agapornis personata*) 5
Fischer's love bird (*Agapornis fischeri*) 4
Nyassa love bird (*Agapornis lilianæ*) 11
Blue-crowned hanging paroquet (*Loriculus galgulus*) 1
Blue-bonnet paroquet (*Psephotus hæmatorrhous*) 1
Pennant's paroquet (*Platycercus elegans*) 1
Rosella paroquet (*Platycercus eximius*) 1
Crimson-winged paroquet (*Aprosmictus erythropterus*) 1
Ring-necked paroquet (*Conurus torquatus*) 1
Nepalese paroquet (*Conurus nepalensis*) 2
Long-tailed paroquet (*Conurus longicauda*) 1
Blossom-head paroquet (*Conurus cyanocephala*) 1
Grass paroquet (*Melopsittacus undulatus*) 12

CORACIIFORMES

Rhinoceros hornbill (*Buceros rhinoceros*) 1
Jackson's hornbill (*Lophoceros jacksoni*) 1
Sulphur-breasted toucan (*Ramphastos carinatus*) 2
Emin Pasha's barbet (*Trachyphonus emini*) 1
Barred owl (*Strix varia varia*) 11
Florida barred owl (*Strix varia alleni*) 1
Snowy owl (*Nyctea nyctea*) 1
Screech owl (*Otus asio*) 4
Great horned owl (*Bubo virginianus*) 15
Eagle owl (*Bubo bubo*) 1
American barn owl (*Tyto alba pratincola*) 7
African barn owl (*Tyto alba affinis*) 2
Red-shafted flicker (*Colaptes cafer collaris*) 1

PASSERIFORMES

Cock of the rock (*Rupicola rupicola*) 1
Naked-throated bell-bird (*Chasmorhynchus nudicollis*) 1
Red-billed hill-tit (*Liothrix luteus*) 19
Black-gorgeted laughing thrush (*Garrulax pectoralis*) 2
White-eared bulbul (*Otocompsa leucotis*) 3
Red-eared bulbul (*Otocompsa jocosa*) 3
Black-headed bulbul (*Molpastes hæmorrhous*) 3
Piping crow-shrike (*Gymnorhina tibicen*) 1
White-necked raven (*Corvultur albicollis*) 1
European raven (*Corvus corax*) 1
American raven (*Corvus corax sinuatus*) 5
Australian crow (*Corvus coronoides*) 1
American crow (*Corvus brachyrhynchos*) 1
White-breasted crow (*Corvus albus*) 2
American magpie (*Pica pica hudsonia*) 1
Yucatan jay (*Cissilopha yucatanica*) 1
Blue jay (*Cyanocitta cristata*) 2
Green jay (*Xanthoura luxuosa*) 2
Pileated jay (*Cyanocorax pileatus*) 2
Blue honey-creeper (*Cyanerpes cyaneus*) 1
Blue-winged tanager (*Tanagra cyanoptera*) 1
Blue tanager (*Thraupis cana*) 1
Giant whydah (*Diatropura progne*) 1
Paradise whydah (*Steganura paradisea*) 2
Red-crowned bishop bird (*Pyromelana sylvatica*) 12
Red-billed weaver (*Quelea quelea*) 5
Buffalo weaver (*Textor albirostris*) 2
Black-winged coral-billed weaver (*Textor niger nyassae*) 25
Madagascar weaver (*Foudia madagascariensis*) 6
Black-headed weaver (*Hyphanturgus nigriceps*) 30
Emin's scaly-headed finch (*Sporopipes frontalis emini*) 25
St. Helena waxbill (*Estrilda astrilda*) 4
Orange-cheeked waxbill (*Estrilda melpoda*) 1
Rosy-rumped waxbill (*Estrilda rhodopygia*) 1
Blue-headed blue waxbill (*Uræginthus bengalus cyanocephalus*) 3
East African fire-throated finch (*Pytilia kirki*) 10
Strawberry finch (*Amandava amandava*) 24
Nutmeg finch (*Munia punctulata*) 50
White-headed nun (*Munia maja*) 1
Black-headed nun (*Munia atricapilla*) 18
Chestnut-breasted finch (*Munia castanothorax*) 2
Java finch (*Munia oryzivora*) 27
Masked grass finch (*Poëphila personata*) 5
Diamond finch (*Steganopleura guttata*) 1
Zebra finch (*Tæniopygia castanotis*) 15
Cutthroat finch (*Amadina fasciata*) 14
Tanganyika cutthroat finch (*Amadina fasciata alexanderi*) 12

Red-headed finch (*Amadina erythrocephala*)	2
Yellow-headed marshbird (*Agelaius icterocephalus*)	1
Australian gray jumper (*Struthidea cinerea*)	1
Shining starling (*Lamprocorax metallicus*)	1
Southern glossy starling (*Lamprocolius pestis*)	4
Crested starling (*Galeopsar salvadorii*)	1
White-capped starling (*Heteropsar albicapillus*)	1
Indian mynah (*Acridotheres tristis*)	1
Crested mynah (*Æthiopsar cristatellus*)	1
Malay grackle (*Gracula javana*)	1
Bar-jawed troupial (*Gymnomystax melanicterus*)	1
Hooded oriole (*Icterus cucullatus*)	1
Yellow-tailed oriole (*Icterus mesomelas*)	1
Purple grackle (*Quiscalus quiscula*)	1
Greenfinch (*Chloris chloris*)	3
European goldfinch (*Carduelis carduelis*)	4
Brambling (*Fringilla montifringilla*)	4
Yellowhammer (*Emberiza citrinella*)	1
House finch (*Carpodacus mexicanus frontalis*)	2
San Lucas house finch (*Carpodacus mexicanus ruberrimus*)	2
Canary (*Serinus canarius*)	6
Little yellow serin (*Serinus icterus*)	15
Gray singing finch (*Serinus leucopygius*)	9
White-throated sparrow (*Zonotrichia albicollis*)	1
San Diego song sparrow (*Melospiza melodia cooperi*)	2
Coastal pale-bellied sparrow (*Passer griseus suahelicus*)	20
Saffron finch (*Sicalis flaveola*)	9
Blue grosbeak (*Guiraca cærulea*)	2
Chinese grosbeak (*Eophona migratoria sowerbyi*)	1
Red-crested cardinal (*Paroaria cucullata*)	3

REPTILES

Alligator (*Alligator mississipiensis*)	27
Horned toad (*Phrynosoma cornutum*)	9
Gila monster (*Heloderma suspectum*)	8
Beaded lizard (*Heloderma horridum*)	1
Gould's monitor (*Varanus gouldii*)	1
Egyptian monitor (*Varanus niloticus*)	1
Philippine monitor (*Varanus salvator*)	1
West Indian iguana (*Cyclura cornuta*)	1
Ball python (*Python regius*)	1
Rock python (*Python molurus*)	1
Regal python (*Python reticulatus*)	1
African python (*Python sebæ*)	10
Anaconda (*Eunectes murinus*)	2
Boa constrictor (*Constrictor constrictor*)	3
Porto Rican tree-boa (*Epicrates angulifer*)	5
Brazilian tree boa (*Epicrates crassus*)	1
Black snake (*Coluber constrictor*)	1
Corn snake (*Elaphe guttata*)	1
Pine snake (*Pituophis melanoleucus*)	2
King snake (*Lampropeltis getulus*)	1
Four-lined snake (*Elaphe 4-vittata*)	1
Hog-nosed snake (*Heterodon platyrhinos*)	1
Water snake (*Natrix sipedon*)	2
Egyptian cobra (*Naja haie*)	2
Black-necked spitting cobra (*Naja nigricollis*)	1
Copperhead (*Agkistrodon mokasen*)	5
Fer-de-lance (*Bothrops lanceolatus*)	1
Florida rattlesnake (*Crotalus adamanteus*)	2
Western diamond rattlesnake (*Crotalus atrox*)	1
Banded rattlesnake (*Crotalus horridus*)	4
Snapping turtle (*Chelydra serpentina*)	2
Florida snapping turtle (*Chelydra osceola*)	1
African mud terrapin (*Pelusius nigricans*)	26
African snake-necked terrapin (*Pelomedusa galeata*)	40
Brazilian snake-necked terrapin (*Hydraspis hilarii*)	1
Diamond-back terrapin (*Malaclemys centrata*)	2
Geographic terrapin (*Graptemys geographica*)	1
Musk turtle (*Sternotherus odoratus*)	1
Mexican musk turtle (*Kinosternon sonoriense*)	1
South American musk turtle (*Kinosternon scorpioides*)	5
Pennsylvania musk turtle (*Kinosternon subrubrum*)	2
Wood turtle (*Clemmys insculpta*)	3
Leprous terrapin (*Clemmys leprosa*)	1
Muhlenberg's terrapin (*Clemmys muhlenbergi*)	2
Blanding's terrapin (*Emys blandingii*)	2
European pond turtle (*Emys orbicularis*)	3
South American terrapin (*Nicoria punctularia*)	1
Reeves turtle (*Geoclemys reevesi*)	1
Loochoo turtle (*Geoemyda spengleri*)	1
Ceylon terrapin (*Geoemyda thermalis*)	6
Painted turtle (*Chrysemys picta*)	2
Western painted turtle (*Chrysemys belli*)	1
Gopher tortoise (*Gopherus polyphemus*)	1
Duncan Island tortoise (*Testudo ephippium*)	3

Indefatigable Island tortoise (*Testudo porteri*)	1
Albemarle Island tortoise (*Testudo vicina*)	2
South American tortoise (*Testudo denticulata*)	1
Angulated tortoise (*Testudo angulata*)	1
Bell's tortoise (*Testudo belli*)	3
Leopard tortoise (*Testudo pardalis*)	6
Agassiz's tortoise (*Testudo agassizii*)	1
Berlandier's tortoise (*Testudo berlandieri*)	1
Iberian tortoise (*Testudo iberia*)	1
Soft-shelled tortoise (*Testudo loveridgei*)	8
Chicken turtle (*Deirochelys reticularia*)	1

BATRACHIANS

African smooth-clawed frog (*Xenopus mulleri*)	28
Giant salamander (*Megalobatrachus japonicus*)	2

Statement of the collection

	Mammals	Birds	Reptiles and batrachians	Total
Presented	47	40	51	138
Born	49	29		78
Received in exchange	16	16	3	35
Purchased	30	76	6	112
Transferred from other Government departments	3			3
Total	145	161	60	336

SUMMARY

Animals on hand July 1, 1927	2,366
Accessions during the year	366
Total animals handled	2,732
Deduct loss (by death, return of animals, and exchange)	459
	2,273

Status of collection

	Species	Individuals
Mammals	186	529
Birds	329	1,481
Reptiles and batrachians	67	263
Total	582	2,273

VISITORS

The estimated attendance as recorded in the daily reports of the park was somewhat smaller than last year, when the interest of the public in the Smithsonian-Chrysler expedition brought great crowds of visitors; however, it is higher than any other year in the history of the zoo, and from observation the number of out-of-town visitors was unusually great. One morning there were 1,100 visitors from the State of Pennsylvania and another morning 750 from the same State. Automobile license tags show that visitors come from every State in the Union.

Attendance by months was as follows:

1927		1928	
July	303,800	January	65,150
August	266,900	February	68,875
September	307,300	March	122,750
October	238,650	April	286,624
November	134,700	May	211,250
December	40,300	June	252,150
		Total for year	2,298,449

During the year the park has been the center of a number of scientific activities. The American Society of Mammalogists, the American Ornithologists' Union, and the Society of Ichthyologists and Herpetologists all visited the park officially and had their annual smoker at the administration building. The Vivarium Society has held monthly meetings at the park.

The attendance of organized classes of students was 27.959, from 445 different schools.

IMPROVEMENTS

The bird house was completed in June and the installation of the birds commenced, so the building will be opened to the public early in the summer. This building is unique of its kind in providing four rooms under one roof, with 145 indoor cages. The great flight cage in the center room is 58 feet long by 22 feet wide and 30 feet high, with rock work and running water at one end, a large pool in the middle, and a fine tree at the opposite end, and makes, with its contents, a remarkably fine exhibit. Mr. Harris, the District architect, and Arthur L. Smith, the contractor, deserve great credit for this building, which has been highly praised by visitors from other zoological parks and by the public in general.

Outdoor cages will be built during the coming fall, which will make the bird house the center of the ornithological section of the park. It is planned to develop the area about this building as runs for outdoor birds.

In connection with the bird house, the maintenance force of the park has done a great deal of work, cutting down a considerable hill to permit a good approach to the building, building walks and roads, installing sewers, and other details necessary to the new building, so that in general we have been able to make few improvements in other parts of the park.

NEEDS OF THE ZOO

At present a considerable part of the appropriation has to be spent each year in repairing temporary structures. (Report of June 30, 1902.)

The inadequacy of the appropriations for the proper equipment of the park has made it necessary to exercise an unwise economy in the construction of its

buildings and other shelters, the majority of which are of a cheap and temporary character, and sooner or later must be replaced. (Report of June 30, 1906.)

It should be remembered that at the inception of the park the funds provided for buildings and improvements were entirely inadequate for its proper equipment and that consequently the management was forced to construct cheap, temporary shelters, roads, walks, and inclosures. These have now arrived at about their limit of usefulness and do not admit of further economical repair. (Report of June 30, 1909.)

The buildings mentioned in the above reports are still being used.

For more than 20 years earnest, but at the same time modest, appeals have been made in each annual report for adequate housing of the animals. Our buildings have been for years a source of most unfavorable comment on the part of visitors. While other zoos throughout the United States have been improving and enlarging, the National Zoological Park, with the exception of the bird house, has been able to do almost nothing in the way of construction, so that at present, in comparison with a half dozen other American zoos, our equipment is extremely shabby. It is impossible to maintain the collection at its present status if this condition is ignored. The fine new bird house just completed is an indication of the conditions that should be provided for other animals.

To house a collection of animals properly, suitable buildings are needed, and the following building program is presented. This program is limited to strictly essential buildings:

1. Exhibition house for reptiles, amphibians, and invertebrates, with proper heating and lighting apparatus (based on cost of recent reptile houses elsewhere)	$220,000
2. Ape, lemur, and small mammal house—this to house the collection of small mammals of the world and to have a wing for the great apes	150,000
3. Pachyderm house—this to include also quarters for giraffe	250,000
4. To make permanent one wing of the carnivore house and to remodel the one wing which is of sufficient value to repair	100,000
5. Antelope, buffalo, and wild-cattle house	100,000
6. To add wing to bird house and develop areas about with open-air aviaries, pheasant and game-bird runs	100,000
7. A proper fence around the park (a high iron fence on a concrete base)	85,000

The above items are most necessary. To these should be added:

8. Open, barless exhibition quarters for bears, lions, and tigers. Such exhibitions are most popular and some of the newer zoological parks are specializing in them. It is our desire to have only a limited number of these	80,000
9. Monkey pit—a barless, open village for monkeys	10,000

Respectfully submitted.

W. M. Mann, *Director.*

Dr. Charles G. Abbot,
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 February 11, 1927:

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, $32,060, of which amount not to exceed $29,000 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*) *Reduction of observations.*—Three field stations—Table Mountain, Calif., Montezuma, Chile, and Brukkaros, South West Africa—are now steadily sending results of daily observations of the intensity of solar radiation to the Smithsonian Institution. The work of comparing these observations, of detecting and determining sources of error, and correcting therefor, and the care of keeping the three

stations, thousands of miles away in the wilderness, supplied with material and personnel has occupied much time of the director and staff in Washington.

Several years having gone by since the station at Table Mountain began its regular work, enough data had accumulated to justify a statistical study over the whole period, to detect any systematic errors. Minute systematic errors in the uncorrected results are inevitable. We are attempting to determine the intensity of the sun's energy not only as it is received at the observatory but also as it was in free space outside the atmosphere. Humidity and dust produce effects which it is impossible to ascertain precisely on any given individual day by any method. Hence only by comparing the average run of the results over a term of years with the average run of atmospheric conditions during the same interval can these not quite negligible residual systematic errors be determined and allowed for. Such a study of the Table Mountain work has been in progress. When completed there were revealed certain discordances between Table Mountain and Montezuma which, though small, demanded still further study.

As so often has happened in the history of science, this study by my colleague, Mr. Fowle, of a perplexing discordance has brought a new discovery of some importance. It is that the ozone existing in the atmosphere at a level of 30 to 50 kilometers (18 to 30 miles), and which is formed from the atmospheric oxygen by the action of invisible ultra-violet sun rays, is variable in amount over Table Mountain, though nearly constant in amount over Montezuma. The discrepancy in the final results of radiation work between the two stations appears to be due mainly to this variability of atmospheric ozone at Table Mountain. Regular observations of ozone are now in progress there in cooperation with Doctor Dobson, of Oxford, England.

The tedious but necessary computations and statistical comparisons involved in the work of systematizing and correcting the preliminary results of the observations, only part of which is indicated in the discussion above, have employed Mr. Fowle and two computers continually during the year.

(*b*) *Apparatus.*—Under the direction of the writer and his colleague, Mr. Aldrich, the instrument maker, Mr. Kramer, has continued to make apparatus for radiation investigations. One instrument upon which much attention has been lavished is a new form of pyrheliometer to measure more accurately and conveniently the sun's radiation. So accurate and stable is the silver-disk pyrheliometer which we have employed for nearly 20 years, and of which over 50 copies have been furnished by the Smithsonian at cost to other insti-

tutions at home and abroad, that it is hard to prepare a new instrument superior to it. Yet there are two or three slight sources of error, and a certain slowness of reading characteristic of the silver-disk instrument which it is hoped to improve upon. Thus far the new instrument, of a compensating electrical type, has not quite reached expectations, but it is still hoped to overcome its deficiencies and retain its advantages.

Attention was also paid to the improvement of the radiometer for measuring the energy of the spectra of the stars. In this instrument it was proposed to seal the sensitive element in a truly circular, optically figured quartz tube containing a small pressure of hydrogen, and to adjust the position and direction of the system by moving and rotating the inclosing cylinder. The device was made ready for use by the writer during the summer of 1928 at Mount Wilson, Calif., with good results, which will properly be described in next year's report.

In connection with a research by Mr. Aldrich on the radiation and convection of the normally clothed human body, a number of instrumental appliances were also made.

(*c*) *Research on the loss of heat from the human body.*—Inquiry was made of the writer by Mr. T. J. Duffield, secretary to the New York Commission on Ventilation, as to the proportion of the loss of heat of the normally clothed human body which should be ascribed to radiation rather than to convection by the air. The subject needed investigation, and at the writer's suggestion a grant of $1,000 was made by the New York Commission on Ventilation to the Smithsonian to promote it. My colleague, Mr. Aldrich, undertook the work and made several long series of novel and valuable experiments, the results of which will shortly be published. He employed principally two instruments: First, the melikeron, or honeycomb pyranometer, for observing radiation of bodies at low temperature, first described in these reports for the years 1919 and 1920; and second, a special thermoelectric temperature tester constructed for the research.

Mr. Aldrich sums up his results as follows:

(1) The radiation from the skin and clothing is approximately that of a "black body" or perfect radiator.

(2) Skin temperatures computed from melikeron radiation measurements are about 1° C. higher than skin temperatures measured directly with the thermoelement. This is not true on clothing of calorimeters. Apparently the melikeron sees deeper into the pores of the skin than the level observed by the thermoelement.

(3) A cloth-covered, vertical, cylindrical calorimeter at body temperature loses in still air 60 per cent by radiation, 40 per cent by convection. A similar horizontal calorimeter loses 54 per cent by radiation, 46 per cent by convection. The human body convection

loss is probably similar to this; that is, the convection loss is roughly one-third less than the radiation loss in still air and normal room temperatures.

(4) Increasing air motion rapidly decreases the percentage radiation loss and increases the convectional. With the vertical calorimeter:

Air motion:	Per cent radiation loss
0	60
75 feet per minute	41
130 feet per minute	35
190 feet per minute	25

(5) Total body radiation similarly decreases with air motion:

Air motion:	Radiation loss (mean for 10 subjects)
50 feet per minute	30.7 large cal. per sq. m. per hour.
50 to 100 feet per minute	29.3 large cal. per sq. m. per hour.
100 to 150 feet per minute	25.7 large cal. per sq. m. per hour.
180 to 250 feet per minute	23.2 large cal. per sq. m. per hour.

(6) Increase in room temperature (which also means increase in wall temperature) produces a progressive lowering of radiation loss. The ratio $\frac{\text{Radiation loss}}{\text{Basal metabolism}}$ decreases with increase of room and wall temperature:

Radiation loss

	Room temperature	Basa metabolism
Table L	21°.3	0.80 (mean of 10 subjects).
	24°.1	.75 (mean of 10 subjects).
Table J	22°.1	.84 (mean of 3 subjects).
	24°.5	.74 (mean of 4 subjects).
	25°.6	.66 (mean of 3 subjects).

(7) Keeping room and wall temperatures unchanged, the temperature of the skin and clothing decreases with increasing air motion, the decrease being greatest on the side facing the wind and about one-half as great on the side away from the wind. The clothing temperature drop on the side toward the wind is about one-third greater than the corresponding skin temperature drop. Summary of 10 subjects:

Air motion (feet per minute)	Skin temperature drop		Clothing temperature drop		
	Away from wind	Toward wind	Away from wind	Toward wind	Perpendicular to wind
0 to 100	−°.4	−°.8	−°.6	−1°.3	−°.5
100 to 250	−°.7	−1°.2	−°.4	−1°.7	−°.5

(8) At normal indoor temperature, in still air and with the subject normally clothed and at rest, body heat losses are distributed as follows:

	Per cent
Evaporation of water	24
Radiation	46
Convection	30

(9) Tests with the thermoelement show that the air temperature falls to room temperature very rapidly as the distance from the body increases. That is, there is a steep temperature gradient in the first centimeter or so from the body surface. With the thermoelement 30 cm. away no effect of the presence of the body could be detected.

(10) The Abbot-Benedict work (Table A) indicates that the radiation loss from a nude subject is about twice as great for a room temperature of 15° as it is for a room temperature of 26°. This evidence does not entirely support the "suit-of-clothes" theory referred to by DuBois. In explanation of this theory, he says (p. 385, 1927 ed. Basal Metabolism): "A constriction of the peripheral blood vessels (occurs) and the amount of heat carried to the surface is relatively small in proportion to the heat produced. * * * The patient really changes his integument into a suit of clothes and withdraws the zone where the blood is cooled from the skin to a level some distance below the surface."

(11) Normal fluctuations in humidity indoors produce negligible effect upon the radiation loss. This is to be expected. Our bodies, about 300° absolute, radiate almost wholly between the wave lengths 4μ and 50μ with a maximum at 10μ. Water vapor absorption is so strong for much of this range and so nearly negligible near the maximum, that its possible effect is so fully produced, even by the humidity of an ordinary room, that the effect of changes of the quantity of water vapor in the ordinary room is small. Were the air of the room exceedingly dry, changes might be noticeable.

WORK IN THE FIELD

(*a*) *Solar radiation work at three desert mountain stations.*—As far as possible, daily measurements of the intensity of solar radiation have been made at the Smithsonian stations at Table Mountain, Calif., and Mount Montezuma, Chile. Also similar measurements have gone on regularly at the cooperating station of the National Geographic Society on Mount Brukkaros, South West Africa.

Pending completion of the statistical investigations of the results of the two last-named stations, as mentioned above, only the results obtained at Mount Montezuma are being published at present. By continued cooperation of the United States Weather Bureau, the daily

telegraphed values of the solar constant of radiation are being regularly published on the Washington daily weather map.

As tentatively and privately forecasted in November, 1927, on the basis of hitherto observed periodicities in solar phenomena, the "solar constant" values reached a high level in the spring months of 1928, and were expected to reach a low level in the autumn.[1] Much interest attaches to these tentative forecasts of the solar energy to be expected for long periods in advance, but several years must yet elapse before (if ever) they can be made with sufficient confidence to justify publication.

Although the solar radiation measurements have been reduced to a routine for several years at all our stations, the very high degree of accuracy now demanded and generally achieved is occasionally marred by new and unexpected accidents and difficulties. Thus internal evidence disclosed that some obscure error of very considerable amount began in August, 1927, to affect the sky radiation measurements of the pyranometer on Table Mountain. Our best thought and many experiments had failed to disclose the obscure cause up to the close of the period of this report, but by anticipation I may say that at this time of writing (October 3) the error has been detected, cured, and a beginning has been made to eliminate its influence from the final results of the observations. This circumstance has prevented us from making public Table Mountain results hitherto.

(*b*) *Measurements of atmospheric ozone.*—Doctor Dobson, of Oxford, England, having perfected a spectroscopic method for determining the quantity of atmospheric ozone, has found that quantity variable in most interesting relations to solar phenomena and to weather. He has established a chain of cooperating observatories in Europe, and, by aid of a grant from Mr. John A. Roebling, the Smithsonian was able to equip the Montezuma station with the necessary apparatus. For about one year daily measurements were made at Montezuma by Field Director Freeman, aided by Mrs. Freeman. The photographs taken were reduced in England by Doctor Dobson and his colleagues, but, contrary to European experience, showed almost zero variation. They also showed a much smaller quantity of atmospheric ozone at Montezuma than in Europe.

Finding further observations at Montezuma unnecessary because of the uniformly constant results, the apparatus was returned to Oxford, restandardized, and sent to Table Mountain, Calif., where it is now installed for daily observing.

(*c*) *Expeditions to Mount Wilson.*—As stated in last year's report, the writer undertook at Mount Wilson, in the autumn of 1927, to

[1]At this writing (October 3), this latter forecast also has been supported by September results.

continue radiometer measurements of the distribution of energy in the spectra of the stars. This work was made possible by the availability of the 100-inch telescope of the Mount Wilson Observatory. It had been proposed to substitute hydrogen for air in the radiometer, on the theory that the radiometer reaction would be nearly the same, but the damping and consequent sluggishness of action would be much diminished in so light and free-moving a gas as hydrogen.

Arriving in July, 1927, at Pasadena, the writer constructed the radiometer vanes from bits of house-flies' wings. Incidentally it was observed that it requires about 6,000,000 house-flies' wings to weigh one pound. With a fragment of microscope cover glass (ground and polished to about one-third the usual thickness) the mirror of the radiometer system was prepared. Two such systems of unequal, but both of almost microscopic size, were hung upon quartz fibers so fine as usually to be invisible, and were tested in air and in hydrogen at various pressures. With them was used also a bolometric element designed to give basis for an estimate of the comparative rise of temperature of the radiometer vanes, when exposed to a constant source of radiation, but contained in the different test gases.

Hydrogen proved somewhat less efficient in regard to rise of temperature and radiometer reaction than air, but abundantly justified the expectation that its damping properties were much less objectionable. On the whole, hydrogen appeared greatly superior as the radiometer gas, and a carefully built system, with vanes 0.35 milimeters wide and 1 millimeter tall, was constructed. It had three vanes in parallel on either side of the stem, separated 1 millimeter between centers. This system was sealed into a glass [1] case in hydrogen under 0.23 millimeter pressure of mercury. Provision had been made to rotate the system by a magnetic device.

After many trials, the device proved useless, because the mechanism required to rotate the system so as to bring it to face in the proper direction so stirred up the gas that wholly unexpected motions resulted. After much labor the experiment was given up for the year 1927.

For use in 1928, at Doctor Adams's suggestion, there was prepared an optically figured quartz cylindrical vessel. This fused quartz cylinder, of beautiful clearness, was made to my order by the General Electric Co., and was figured within and without at the Mount Wilson Observatory shop. Being truly a circular cylinder with optically figured concentric walls, it mattered not at all in what direction the radiometer looked out. Thus by mounting the whole cylinder from a

[1] I am greatly indebted to the director and staff of the Bureau of Standards, especially Mr. Sperling, and to the director and staff of the Mount Wilson Observatory, especially Mr. Pompeo, for the construction of the special glass apparatus and the preparation for its use on Mount Wilson.

brass support, rotatable in a ground joint, the radiometer could be inclosed in an airtight outside case of brass having windows, toward which the radiometer could at any time be made to look out by merely rotating the brass piece in its well-ground seat.

With this simple but adequate apparatus the Mount Wilson expedition was renewed by the writer in 1928, with a high degree of success, which must be related in next year's report.

Personnel.—During the year the personnel has been as follows:

At Washington:
- *Director*, Dr. C. G. Abbot.
- *Research assistants*, F. E. Fowle, Jr., L. B. Aldrich.
- *Temporary assistant*, M. K. Baughman.
- *Computers*, Mrs. A. M. Bond, Miss M. A. Marsden.
- *Instrument maker*, A. Kramer.

At Table Mountain:
- *Field director*, A. F. Moore.
- *Field assistants*, H. H. Zodtner, H. B. Freeman.[1]

At Mount Montezuma:
- *Field directors*, H. B. Freeman, H. H. Zodtner.
- *Field assistants*, E. E. Warner, M. K. Baughman.

At Mount Brukkaros:
- *Field director*, W. H. Hoover.
- *Field assistant*, F. A. Greeley.

Summary.—A novel research on the relative cooling of the human body by radiation and by air convection has yielded unexpected and valuable results. Improvements in instruments include a new form of sensitive radiometer in which by the substitution of hydrogen for air a great increase in quickness of response permits the use of excessively light systems and promises a great development of sensitiveness. Continued progress in the reduction and systematization of the results of solar radiation work have brought the study of the ozone content of the atmosphere as a new element in the determination of the solar constant of radiation. Daily observations have been continued at Table Mountain, Calif., Mount Montezuma, Chile, and (in cooperation with the National Geographic Society) at Mount Brukkaros, South West Africa. By cooperation with the United States Weather Bureau, daily publication of the values of the solar constant of radiation for the use of meteorologists has been effected.

C. G. Abbot,
Director, Astrophysical Observatory.

The Secretary,
The Smithsonian Institution.

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[1] Mr. Freeman assisted for a short time after his return from South America, pending other assignment.

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, 1928:

Since actual publication of the International Catalogue was suspended in 1922, owing to the inability of the foreign bureaus to contribute their quota of the necessary financial support, it has been the policy of this bureau to keep its expenditures at the lowest possible amount consistent with the need of keeping the organization operating sufficiently to compile the necessary records of current scientific publications. This policy has been explained each year to the Bureau of the Budget and to congressional appropriation committees, the understanding being that until publication was resumed some part of the appropriation would revert to the surplus fund of the Treasury. Each year a surplus has reverted, and this year it was found possible to allow the classifier to take seven months' furlough without seriously interfering with the necessary routine. By this means an additional saving of $1,225 was made, the gross expenditures of the year being $5,867.29 out of the appropriation of $7,260, the remainder, $1,392.71, reverting to the Treasury.

As the financial status of a number of the cooperating foreign countries now appears to be established on a firmer basis than at any time since the war, this bureau is making an effort, through correspondence, to formulate a practical plan whereby the necessary support may be had to enable the Central Bureau to resume publication. To this end letters were sent to the several members of the executive committee of the catalogue and to the director of the London Central Bureau in whose hands control of the organization is vested. As these letters outline the situation and are self-explanatory, I submit copies herewith.

MAY 22, 1928.

DEAR SIR: As a member of the executive committee of the International Catalogue of Scientific Literature, to which the International Convention in Brussels in July, 1922, referred the question of the future of the undertaking, I beg to submit the following:

Among the resolutions adopted, 4 and 5 read as follows:

(4) That the convention is of opinion that the international organization should be kept in being through mutual agreement to continue as far as possible the work of the regional bureaus until such time as it may be economically possible to resume publication.

(5) That it be referred to the executive committee to consider and, after full consultation with interested bodies, to make proposals as to the form of future publication and to report with some definite scheme to a meeting of the international council, to be summoned as soon as it appears possible that publication can be resumed.

From the implied agreement in resolution 4, I assume that the organization may still look to the regional bureaus to take up again their former work when called on by the central bureau to do so, and from resolution 5 it is clearly the duty of the executive committee to formulate a definite scheme as soon as it appears possible that publication can be resumed.

As a preliminary step to the preparation of such a scheme an exchange of views by correspondence among the several members of the executive committee seems desirable, in order that all local and personal ideas may be assembled and coordinated before summoning a meeting of the international council.

Among the questions which might be satisfactorily settled through correspondence are the following:

To what extent could the central bureau depend on each regional bureau (1) to supply classified data and (2) to secure subscriptions for the support of the Catalogue.

Could an edition of 1,000 sets be disposed of at $50 per set?

Could a catalogue aggregating 10,000 pages be produced for $50,000 per year?

I am of the opinion that this sum would be sufficient, and submit with this copies of two letters sent to Doctor Morley and Professor Armstrong on January 12, 1928, outlining the present condition as I see it and giving an estimate of the probable cost of publication.

I would appreciate detailed suggestions which would further in any way our common aim and, as I think, duty to prepare and report a definite scheme whereby this unique and valuable international work may be enabled to resume publication.

I am most anxious also to have such a definite and well-considered plan available to submit to possible donors, should any appear, before a meeting of the international council is held.

Trusting that this move may meet with your approval and gain your cooperation, I am

Sincerely yours,

LEONARD C. GUNNELL.

JANUARY 12, 1928.

Dr. H. FORSTER MORLEY,

Director, International Catalogue of Scientific Literature,

London, England.

DEAR DOCTOR MORLEY: I am sending with this a copy of a letter sent to-day to Professor Armstrong and trust that you and he will be able to outline some plan of action whereby the Catalogue may again be published. With 10,000 pages to be printed each year, or about 33 pages per day of printed matter that could be made simple and uniform in character, I believe that the organization could profitably run a plant of its own and issue classified cards, or advance sheets, of the material to be later assembled and published in annual catalogues.

* * * I have just consulted a practical printer and he states that our requirements could be met with two typesetting machines and one high-grade press, costing approximately a total of $10,000. * * * I believe the whole yearly cost of printing could be met for $17,500. These are American estimates and the cost should be materially less in England, but even this figure is half the estimated cost at $3.50 per page. Although the figures are necessarily only approximate they are encouraging enough to warrant looking into the matter in detail. With your central bureau and printing plant under one roof the organization would certainly be in a position to overcome the most serious faults charged against the Catalogue, high price, and delayed publication.

I did not want to complicate my letter to Professor Armstrong, but the cost of production is the only really serious question to confront us for there is no question in my mind as to the need of the Catalogue, and as we produced it once we can produce it again. Every dollar cut from the subscription price will, without doubt, increase the number of subscribers, therefore I am most anxious to get your opinion of this phase of the problem. Editing, assembling, and printing in our case is a question of uniform and continuous production and can certainly be greatly simplified and cheapened if we consider it in that light.

With kindest regards, I am

Sincerely yours,

LEONARD C. GUNNELL.

JANUARY 12, 1928.

Prof. HENRY E. ARMSTRONG,

Chairman, Executive Committee International Catalogue of Scientific Literature, Royal Society of London, London, England.

DEAR PROFESSOR ARMSTRONG: I feel that if the International Catalogue is ever to resume publication some definite steps should be taken looking to that end. Assuming that the agreement made by the delegates at the Brussels convention of 1922 to keep the organization in being is still in force, the question of resumption is in the hands of the executive committee named at that time and authorized to report with some definite scheme. As I am one of that committee, of which you are the chairman, I feel that any steps I might take, after consulting you, in an attempt to forward the interests of the Catalogue would be within my province and can be taken quite independently of the Smithsonian Institution, which need not appear in the matter until some assurance of success is evident.

The situation as I see it is: That the International Catalogue of Scientific Literature, to supply an authors' and classified subject catalogue of the current literature of pure science, is as much a necessity now as it was in 1900, since no similar service or publication has taken its place.

That the organization still exists duly authorized to prepare and publish such a catalogue.

That the enterprise can be made self-supporting if financial support sufficient to cover one year's editorial and printing expenses can be procured.

That if an edition of 1,000 sets can be sold at $50 a set the publication costs can be covered.

I am led to this opinion by the fact that a prominent American publisher has offered, if furnished regularly with manuscript to fill 10,000 pages of printed matter, to print, publish, and bind, in paper, an edition of 1,000 for $3.50 a page, or $35,000. Adding $15,000 as the approximate cost of a central bureau staff, the total would be $50,000 needed for an edition of 1,000. I believe that regular subscribers to take this edition of 1,000 sets could be readily enrolled at a price of $50 per set and the organization would thus become self-supporting. I assume

that if American publishers could print the Catalogue for $3.50 per page, in an edition of 1,000, some English printer would do the work for that sum or less.

Before any financial aid could be reasonably applied for the "definite scheme," which the executive committee was authorized to prepare, would have to be submitted, and I think that it is time for the committee to take some action.

A definite scheme could be prepared after taking the matter up with the regional bureaus and determining the probable support each could be depended on to provide in material for the Catalogue and subscribers. It would then be necessary to prepare revised schedules of classification and lists of journals to be indexed. From previous experience I am sure that you will agree with me that the schedules should be far more simple than those previously used and that the journals and papers indexed should be limited strictly to pure science, else the whole undertaking would be too ponderous at the very beginning. I feel that after a start has been made an allied though supplementary index of the applied sciences would be feasible and certainly most desirable, but this could not be attempted until the more simple index to pure science is provided and put on a paying basis. What in your opinion would be the attitude of the Royal Society and the Zoological Record?

The plan published in the acta of the convention of 1922 included disposal of the stock of complete sets at a reduced price, when publication should be resumed, as a means of repaying the debt to the Royal Society, and this plan would still hold.

With kindest regards, I am

Sincerely yours, LEONARD C. GUNNELL.

While it is as yet too soon to forecast what the result of this move toward reorganization will be, it seems probable that the various countries previously represented will again cooperate by furnishing the necessary bibliographical data to the central bureau, but it is doubtful if they are in a position to subscribe to the capital fund necessary to start the operations of the central bureau.

The French bureau's reply, dated June 22, 1928, seems to bear out this idea, the reply stating: "If therefore the Catalogue were resumed we could immediately furnish everything relating to France." The French bureau, however, could promise nothing toward the support of the central bureau, but has requested the director of public instruction to canvass the French universities for subscribers.

If during the coming year a definite scheme can be agreed upon by the countries formerly cooperating in the work, it appears likely that the comparatively small sum needed to begin publication could be raised in the United States. It would appear both fitting and proper to have aid extended from this country to reestablish a great and useful enterprise originally founded on the idea and suggestion of an American pioneer in science, Joseph Henry, first secretary of the Smithsonian Institution.

Respectfully submitted.

LEONARD C. GUNNELL,
Assistant in Charge.

DR. CHARLES G. ABBOT,
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, 1928:

THE LIBRARY

The Smithsonian library, or, more properly speaking, the Smithsonian library system, is comprised of the Smithsonian deposit in the Library of Congress, which is the main library of the Institution, the library of the United States National Museum, the Smithsonian office library, the Langley aeronautical library, the technological library, and the libraries of the Astrophysical Observatory, the National Gallery of Art, the Freer Gallery of Art, and the National Zoological Park, together with the 36 sectional libraries of the National Museum. To these may later be added a tenth divisional library, namely, that of the Bureau of American Ethnology. With its 700,000 volumes, pamphlets, and charts, chiefly scientific in character, including especially society and serial publications, the Smithsonian library not only is an invaluable instrument in the work of the Institution and indirectly of other research institutions throughout the country, but represents an important link in the chain of libraries in the service of the Federal Government.

THE STAFF

It is gratifying to report that during the last fiscal year a way was found of providing for a second position of assistant librarian—the first, that of chief of the reference department, having been established two years before. This new position will be set up immediately and will be filled by the appointment of a chief for the accessions department—the department which acquires publications for the library, partly by purchase and gift but mainly by exchange; which carries on an extensive correspondence, particularly with the learned societies and institutions of the world, keeps a file of this correspondence and a record of the items acquired, with their sources, and assigns them to the divisions and sections of the library in which they promise to be of most use.

Several changes occurred in the personnel during the year. Mrs. Natalie M. Bennett, junior librarian, resigned and her place was filled by the appointment of Miss Gertrude L. Woodin, a graduate of Wellesley College and of the Albany Library School, who has had many years of experience in library work. Miss Woodin is directing the preparation of the union catalogue. Mr. R. Webb Noyes, junior librarian, also resigned and was succeeded by Miss Elisabeth Hobbs, a graduate of George Washington University and of Simmons College Library School. At various times during the year the following persons were members of the staff on temporary appointment: Miss Helen V. Barnes, Mrs. Adella E. Blanchard, Mr. Arthur W. Gerth, Miss Elisabeth Hobbs, Miss Josephine H. Kinney, Miss Mary Ladd, Mrs. M. Landon Reed, Mrs. Hope H. Simmons, and Mr. Giles E. Taggart.

EXCHANGE OF PUBLICATIONS

Since its founding in 1846 the Smithsonian Institution and its branches as one by one they have come into being have sent their publications to other learned institutions and societies and to editors of scientific journals throughout the world, and have received their publications in return. Although from the beginning the increase of the Smithsonian library has been due partly to purchases and gifts, it has been due chiefly to this exchange. These publications have come to the library direct, or through the International Exchange Service, which is administered by the Institution. During the last fiscal year 26,316 packages, of one or more publications each, came by mail, and 6,231 through the exchange. After these 32,547 packages had been opened the items were stamped, entered, and sent to the appropriate units of the library, but chiefly to the Smithsonian deposit in the Library of Congress and the library of the United States National Museum. In connection with the acquiring of this material the library wrote about 1,100 letters, sent out thousands of acknowledgments, and took up exchange relations with many new societies.

As usual dissertations were received from various universities and technical schools both at home and abroad.

GIFTS

The gifts for the year were many. Two were especially noteworthy. One was the Chinese library of the late Hon. William Woodville Rockhill, well-known traveler, scholar, and United States minister to China. This was presented to the Institution by Mrs. Rockhill, and was deposited in the Freer Gallery of Art. It consisted of 1,100 volumes on the history, geography, literature, and

culture of Central Asia, particularly of Mongolia and Thibet, and included a number of rare items, several in manuscript, and various works of general reference, among which was a copy of the Palace Edition of the Imperial Dictionary issued in 1716 in 40 volumes by a commission of scholars under the personal supervision of Emperor K'ang Hsi. This gift constitutes a most valuable supplement not only to the Chinese works in the library of the Freer Gallery but to those in the oriental division of the Library of Congress.

The other noteworthy gift came from the American Association for the Advancement of Science. It comprised approximately 3,500 volumes of serial and society publications, from all parts of the world and in nearly all languages, many in almost unbroken sets extending over years. From this collection have already been selected more than 1,500 volumes and parts needed in the Smithsonian deposit and the libraries of the National Museum and the Astrophysical Observatory. Among these were some that were out of print and very rare, including not a few that these libraries had been trying for some time to get to complete their sets. The gift is one of the most useful that the library has received in recent years.

Among other gifts worthy of especial mention were scientific publications in 68 volumes and 47 parts, lacking in the Smithsonian library, from the Library of Congress; North American Wild Flowers, volumes 1 to 3, by Mary Vaux Walcott, from the artist-author; a collection of 70 volumes and 174 pamphlets, mainly on art, from Dr. William H. Holmes, director of the National Gallery; various works, in 50 volumes, chiefly on Egyptian art and archeology, from Mrs. George Cabot Lodge; To Galápagos on the Ara, 1926, by William K. Vanderbilt, from the author; A Souvenir of Wyoming—an illustrated manuscript in 3 volumes, with text by John G. White, being a diary of a fishing trip in Jackson Hole and Yellowstone Park, with remarks on early history and historical geography—from Thomas A. McCaslin; the Ronald Aeronautic Library, in 12 volumes, presented by the publishers at the suggestion of Mr. Paul E. Garber, assistant curator of the divisions of mineral and mechanical technology; and about 300 volumes, pertaining largely to the religions of the Old World, from the estate of Dr. I. M. Casanowicz, late assistant curator of the division of Old World archeology.

Many other gifts were also received, especially from Secretary Abbot, Assistant Secretary Wetmore, Mr. A. H. Clark, Dr. Walter Hough, Dr. Aleš Hrdlička, Dr. W. R. Maxon, Mr. J. U. Perkins, Miss M. J. Rathbun, Dr. C. W. Richmond, Mr. Robert Ridgeway, the late Dr. J. N. Rose, Mr. R. C. Smith, Dr. L. Stejneger, Mr. B. H. Swales, and Dr. J. R. Swanton.

SMITHSONIAN DEPOSIT

The Smithsonian deposit, which, as has been said, is the main library of the Institution, dates from 1866, when by an act of Congress the Institution was authorized to deposit its library of 40,000 volumes in the Library of Congress. It is, of course, distributed according to classification, but because of its prevailingly scientific nature it is chiefly in the Smithsonian division, which was established in 1900 to take care of the scientific publications in the deposit, together with the works of like character belonging to the Library of Congress.

The deposit has grown steadily by additions from the Institution, and is now recognized as one of the outstanding collections of its kind. It is especially rich in serial publications and in the reports, proceedings, and transactions of the learned societies and institutions of the world.

During the fiscal year just ended the Institution sent to the deposit 13,558 publications, of which 2,292 were volumes, 9,773 parts of volumes, 988 pamphlets, and 505 charts. Documents of foreign governments, largely statistical in character, to the number of 7,376, were also sent, without being stamped or entered, to the document division of the Library of Congress. In addition to these, 13,187 dissertations, most of which had been received in previous years from forty or more universities and technical schools in different parts of the world, but which the Institution, for lack of help, had not been able to catalogue, were forwarded to the deposit, that they might be made available to scholars at the earliest possible moment. Short title cards for these dissertations will be sent to the Institution as soon as they are prepared for filing in the union catalogue.

In response to special requests from the Library of Congress for publications wanted for the deposit, the Smithsonian library was able to obtain, as usual, many volumes and parts of volumes by exchange. It is expected that this service will be greatly enlarged in the course of a few months, as the result of the reorganization of the accessions department of the library.

OFFICE LIBRARY

The office library consists of some of the more important society publications that the Institution needs to have continually at hand, a set of its own publications and of those of its branches, the art-room collection, the employees' library, and various reference books, some 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 108 volumes and 34 pamphlets.

The progress made on the union catalogue of the Smithsonian library, which was kept until lately in the office reading room—the room that now has become the catalogue room of the Institution—was notable, especially in connection with the material in the Smithsonian deposit, the office library, the Langley aeronautical library, and the libraries of the National Museum and the Astrophysical Observatory. Cards were also added to the catalogue for the Rockhill collection of 1,100 volumes in Chinese recently given to the Institution and deposited in the library of the Freer Gallery of Art. This progress is shown in detail by the following statistics:

Volumes catalogued	3,137
Volumes recatalogued	3,913
Pamphlets catalogued	1,766
Pamphlets recatalogued	2,846
Charts catalogued	504
Typed cards added to catalogue	3,337
Library of Congress cards added to catalogue	6,372

MUSEUM LIBRARY

The library of the United States National Museum, which ranks next in size and importance to the Smithsonian deposit in the library system of the Institution, is composed principally of works on the different branches of natural history represented in the Museum. Its collections increased during the year by 3,015 volumes and 1,165 pamphlets, totaling more by several hundred than the increase even of the year before when there was an unusually large gain in accessions. The library now numbers 72,315 volumes and 106,881 pamphlets. Some of the additions came, of course, by purchase, but most came, as usual, by exchange and gift. The outstanding gift, which, with other gifts to various divisions of the library of the Institution, is described earlier in this report, was received from the American Association for the Advancement of Science.

In the course of the year 10,526 parts of periodicals were entered, 821 volumes and 1,039 pamphlets were catalogued, and 2,382 cards were added to the shelf list. The number of books and pamphlets sent to the sectional libraries was 6,683. The loans to members of the scientific staff numbered 5,013, of which 2,113 were borrowed from the Library of Congress and 236 elsewhere. The other loans totaled 89. These were made chiefly to Government libraries, but a score or more to libraries outside of Washington, including those of the American Museum of Natural History, Archeological Institute of America, Berkshire Atheneum, Carnegie Museum, E. I. du Pont de Nemours & Co. Experimental Station, Rockefeller Institute, Westfield Normal School, Williams College, and the following universities: Maryland, North Carolina, Princeton, and Toronto. The number of

books sent back to other libraries was 2,451, of which 2,262 were returned to the Library of Congress. The volumes prepared for binding numbered nearly 2,200; of these 1,701 were sent to the bindery during the fiscal year. As usual, thousands of publications were consulted in the reading room, not merely by members of the Museum staff, but by investigators from other departments of the Government and elsewhere, including some from abroad. In connection with their work an increased reference service was rendered by the library staff, as was the case in connection with the many inquiries for information that were received from different parts of the country.

The sectional libraries, which now number 36, were brought into closer working relation with the main library of the Museum and with the other units of the Smithsonian library system. The work of completing their sets of society and serial publications was continued, their binding was considerably advanced, and marked progress was made in cataloguing their collections. The sectional libraries are as follows:

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

TECHNOLOGICAL LIBRARY

The reorganization of the technological library, which is housed in the Arts and Industries Building, received particular attention. Many thousands of Government publications not related directly to the work of the institution and its branches, which had been accumulating in the library for years, were returned to the Superintendent of Documents, thus releasing space for the much needed rearranging and expanding of the collections now going on. The most noticeable change was made in the reference room. The cement floor was covered with a cork carpet, many new shelves were built in, some

of the furniture was done over, and, to make the room still more attractive, several ferns, palms, and other plants—the generous gift of the Bureau of Plant Industry—were placed on the floor and in the gallery. The collections in this room were entirely reorganized, the less used books being removed to other parts of the library, and those in constant demand by the curators put where they would be immediately available. Among the latter were the standard reference works that belong to the library and a set of Smithsonian publications. To this room were also transferred from the Smithsonian Building the current files of scientific and popular periodicals, and the employees' library. Finally, a trained assistant was put in charge, and the room opened to the public, with the result that the library increased its usefulness many fold, not only by making its collections more accessible to the curators, but by providing material and information, both directly and indirectly, for the readers and other visitors who came to it daily.

The accessions for the year are included among those to the Museum library.

ASTROPHYSICAL OBSERVATORY LIBRARY

The library of the Astrophysical Observatory, which occupies part of the main hall of the Smithsonian Building and part of the observatory itself, comprises about 3,767 volumes and 2,725 pamphlets, chiefly on astrophysics and meteorology. It is one of the most important of the smaller units of the Smithsonian library system, and is of especial value in connection with the well-known researches in solar radiation that are being carried on by the Institution. During the past year the catalogue for this library, which was begun the year before, was finished, and the collections were labeled and rearranged. The accessions to the library were 130 volumes, 64 parts of volumes, and 25 pamphlets. The number of volumes bound was 121.

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 27,921 volumes and 16,177 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

The Langley aeronautical library, as the aeronautical collection of the Institution is now called, is rapidly coming to be a prominent division of the Smithsonian library. While it is still comparatively small, numbering only 1,612 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 gift as it came from Samuel Pierpont Langley, the third secretary of the Institution, after whom the library was named, and others among the additions made since by Alexander Graham Bell, Octave Chanute, and James Means. During the last year the recataloguing of this library was begun, and well advanced. The accessions were 12 volumes. Much use was made of the collection, especially by Government experts and others from different parts of the United States and Europe, who were investigating matters of aeronautical interest.

NATIONAL GALLERY OF ART LIBRARY

The library of the National Gallery of Art, which occupies for the present part of the Natural History Building, concerns itself chiefly with the art of the United States and Europe. The collection, while small, totalling only 848 volumes and 1,024 pamphlets, constitutes a carefully chosen nucleus for the larger library that will be formed when a special building is provided for the gallery. The library was increased during the last year by 144 volumes, 714 parts of volumes, and 238 pamphlets. The most important gift was received from Dr. William H. Holmes, director of the gallery. This is mentioned in more detail earlier in this report.

FREER GALLERY OF ART LIBRARY

The library of the Freer Gallery of Art holds a unique place in the Smithsonian library system. It contains many works in the Chinese and Japanese languages, some of which are very rare, and for purposes of research supplements to an important degree the oriental division of the Library of Congress. It has to do mainly with 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 McNeill Whistler and of certain other American painters whose pictures are owned by the gallery; and, further, to a very limited extent, by the Biblical manuscripts of the fourth and fifth centuries, which, as the possession of the Freer Gallery, are known as the Washington manuscripts. Additions to the library during the year numbered 1,126

volumes and 59 pamphlets. These included the William Woodville Rockhill collection of 1,100 volumes in Chinese, which was given to the Smithsonian Institution by Mrs. Rockhill and deposited in the library of the gallery. This valuable gift is described elsewhere in this report. The library now has a total of 4,038 volumes and 2,578 pamphlets. It also has a special collection of about 700 volumes and 500 pamphlets for the use of the field staff of the gallery.

NATIONAL ZOOLOGICAL PARK LIBRARY

The library of the National Zoological Park, which is housed in the administration building at the park, consists of about 1,200 volumes and 300 pamphlets on animals and other subjects of special interest to the curators there. Its accessions during the last year were 11 volumes and 2 pamphlets.

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	130	25	155
Freer Gallery of Art	1,126	59	1,185
Langley aeronautical library	12		12
National Gallery of Art	144	238	382
National Zoological Park	11	2	13
Smithsonian deposit, Library of Congress	2,292	14,680	16,972
Smithsonian office	108	34	142
United States National Museum, including the technological library	3,015	1,165	4,180
Total	6,838	16,203	23,041

The estimated 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, 1928, was as follows:

Volumes	527,941
Pamphlets	156,983
Charts	24,660
Total	709,584

This number does not include the many thousands of volumes in the library still uncatalogued or awaiting completion.

SPECIAL ACTIVITIES

It was possible for the staff to undertake a number of special tasks during the year, several of which may be mentioned.

One of the larger accumulations of reprints was sorted according to subject and distributed to the curators. This was an important step in disposing of material valuable to the Institution but not needed for cataloguing. As soon as help becomes available another accumulation, much larger than the first, will be treated in like manner.

A list was made, in preparation for cataloguing, of some of the special collections, including the Casey, Dall, Gill, Henderson, Lacoe, Roebling, Schaus, Springer, Teller, and Vaux, and of the volumes in the John Donnell Smith botanical collection and the Watts de Peyster library that had not already been catalogued. To expedite this work the Library of Congress was generous enough to contribute for a few weeks the services of two typists, in return for which the Smithsonian library will later provide manuscript cards for the items in these collections, as well as in its other collections, that are not in the library of Congress. These cards will be prepared primarily for the national catalogue that is in progress there under the direction of Dr. Ernest C. Richardson, consultant in bibliography and research.

The generous contribution of material (see "Gifts," p. 124) that was received during the year from the American Association for the Advancement of Science was carefully checked up and many of the items were selected to fill gaps in the sets of serial and society publications. The rest of the contribution will be used in various ways later.

Most of the uncatalogued Russian publications were looked over and those with Roman titles were entered in the catalogue; the rest were put aside, to be sent, with other publications in Russian, Turkish, and Japanese, and probably some in Hungarian, Polish, and Bohemian, to the Smithsonian deposit, that they may be made available to scholars, and cards prepared for them in due course and returned to the Institution.

The organization of the west stacks in the Smithsonian Building was considerably advanced. Many thousands of college and university publications, not needed by the library, were sent to the Bureau of Education, where they would be at hand for completing sets and for exchange. The files of popular and semipopular periodicals, which had for many years been kept in these stacks, were transferred, through the courtesy of the curator of textiles, to a room in the basement, to await final disposal. The geological material was brought together and arranged. The publications that lay in heaps on the floors were grouped roughly on the shelves. This work was all preliminary to the final step in organizing this heterogeneous mass, which contains almost countless items of value, many of which,

it will probably be found later, will serve a purpose either in the library of the Institution or in other Washington libraries. Those that will not, will be used for exchange toward further completing the Smithsonian collections.

During the year the librarian gave 14 public lectures and addresses, 2 on the Smithsonian Institution, the others on literary and educational subjects. In addition to his three regular reports, namely, to the Secretary of the Institution, the Assistant Secretary in charge of the National Museum, and the Librarian of Congress, he prepared for the Secretary two special reports, entitled, respectively, "The Smithsonian Library—an Interpretation" and "Accomplishments of the Smithsonian Library, 1924–1928." In connection with the latter he checked up and listed the special collections in the library. He also contributed descriptions of the various libraries in the Smithsonian library system to the "Handbook of Washington's Informational Resources"—a recently published directory of libraries in the District of Columbia; and prepared a bibliography of significant works in American history and literature for one of the French colleges.

Respectfully submitted.

WILLIAM L. CORBIN, *Librarian.*

Dr. CHARLES G. ABBOT,
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, 1928:

The Institution proper published during the year 11 papers in the series of Smithsonian Miscellaneous Collections, 1 annual report, and pamphlet copies of the 31 articles contained in the report appendix, and 4 special publications. The Bureau of American Ethnology published one annual report and one bulletin. The United States National Museum issued 1 annual report, 3 volumes of proceedings, 5 complete bulletins, 2 parts of a bulletin, 1 complete volume in the series Contributions from the United States National Herbarium, and 57 separates from the proceedings.

Of these publications there were distributed during the year 183,196 copies, which included 102 volumes and separates of the Smithsonian Contributions to Knowledge, 26,099 volumes and separates of the Smithsonian Misscellaneous Collections, 29,720 volumes and separates of the Smithsonian Annual Reports, 5,783 Smithsonian special publications, 111,405 volumes and separates of the various series of National Museum publications, 9,126 publications of the Bureau of American Ethnology, 178 publications of the National Gallery of Art, 28 volumes of the Annals of the Astrophysical Observatory, 42 reports of the Harriman Alaska Expedition, and 713 reports of the American Historical Association.

SMITHSONIAN MISCELLANEOUS COLLECTIONS

Of the Smithsonian Miscellaneous Collections, volume 78, the title-page and table of contents, was issued; volume 79, one paper (whole volume) and title-page and table of contents; and volume 80, 10 papers and title-page and table of contents, as follows:

VOLUME 78

Title-page and table of contents. (Publ. 2920.)

VOLUME 79

World Weather Records. Collected from official sources by Dr. Felix Exner, Dr. G. C. Simpson, Sir Gilbert Walker, H. Helm Clayton, and Robert C. Moss.

man. Assembled and arranged for publication by H. Helm Clayton. Published under grant from John A. Roebling. August 22, 1927. vi+1,199 pp. (Publ. 2913.) (Whole volume.)

Title-page and table of contents. (Publ. 2918.)

VOLUME 80

No. 3. Fossil Footprints from the Grand Canyon: Second Contribution. By Charles W. Gilmore. July 30, 1927. 78 pp., 21 pls., 37 text figs. (Publ. 2917.)

No. 4. Religion in Szechuan Province, China. By David Crockett Graham. February 4, 1928. 83 pp., 25 pls., 16 text figs. (Publ. 2921.)

No. 5. Drawings by A. De Batz in Louisiana, 1732–1735. By David I. Bushnell, jr. December 1, 1927. 14 pp., 6 pls. (Publ. 2925.)

No. 6. Yakṣas. By Ananda K. Coomaraswamy. May 8, 1928. 43 pp., 23 pls. (Publ. 2926.)

No. 7. The Aboriginal Population of America North of Mexico. By James Mooney. February 6, 1928. 40 pp. (Publ. 2956.)

No. 8. Fossil Footprints from the Grand Canyon. Third Contribution. By Charles W. Gilmore. January 28, 1928. 16 pp., 5 pls., 7 text figs. (Publ. 2956.)

No. 9. Aboriginal Wooden Objects from Southern Florida. By J. Walter Fewkes. March 26, 1928. 2 pp., 3 pls. (Publ. 2960.)

No. 10. Drawings by John Webber of Natives of the Northwest Coast of America, 1778. By David I. Bushnell, jr. March 24, 1928. 12 pp., 12 pls. (Publ. 2961.)

No. 11. The Legs and Leg-bearing Segments of Some Primitive Arthropod Groups, with Notes on Leg-segmentation in the Arachnida. By H. E. Ewing. April 23, 1928. 41 pp., 12 pls. (Publ. 2962.)

No. 12. Charles Doolittle Walcott, Secretary of the Smithsonian Institution, 1907–1927. Memorial Meeting, January 24, 1928. May 12, 1928. 37 pp., 1 pl. (Publ. 2964.)

Title-page and table of contents. (Publ. 2969.)

SMITHSONIAN ANNUAL REPORTS

Report for 1926.—The complete volume of the Annual Report of the Board of Regents for 1926 was received from the Public Printer October 4, 1927.

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, 1926. xii+551 pp., 125 pls., 21 text figs. (Publ. 2879.)

The appendix contained 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.

Report for 1927.—The report of the executive committee and proceedings of the Board of Regents of the Institution, and the report of the acting secretary, both forming parts of the annual report of the Board of Regents to Congress, were issued in December, 1927.

Report of the Executive Committee and Proceedings of the Board of Regents of the Smithsonian Institution for the Year Ending June 30, 1927. 12 pp. (Publ. 2924.)

Report of the Acting Secretary of the Smithsonian Institution for the Year Ending June 30, 1927. 131 pp. (Publ. 2923.)

The general appendix to this report, which was in press at the close of the year, contains the following papers:

The Accomplishments of Modern Astronomy, by C. G. Abbot.

Recent Developments of Cosmical Physics, by J. H. Jeans.

The Evolution of Twentieth-Century Physics, by Robert A. Millikan.

Isaac Newton, by Prof. Albert Einstein.

The Nucleus of the Atom, by J. A. Crowther.

The Centenary of Augustin Fresnel, by E. -M. Antoniadi.

Soaring Flight, by Wolfgang Klemperer.

The Coming of the New Coal Age, by Edwin E. Slosson.

Is the Earth Growing Old? By Josef Felix Pompeckj.

Geological Climates, by W. B. Scott.

Geologic Romance of the Finger Lakes, by Prof. Herman F. Fairchild.

Fossil Marine Faunas as Indicators of Climatic Conditions, by Edwin Kirk.

Paleontology and Human Relations, by Stuart Weller.

At the North Pole, by Lincoln Ellsworth.
Bird Banding in America, by Frederick C. Lincoln.
The Distribution of Fresh-water Fishes, by David Starr Jordan.
The Mind of an Insect, by R. E. Snodgrass.
The Evidence Bearing on Man's Evolution, by Aleš Hrdlička.
The Origins of the Chinese Civilization, by Henri Maspero.
Archeology in China, by Liang Chi-Chao.
Indian Villages of Southeast Alaska, by Herbert W. Krieger.
The Interpretation of Aboriginal Mounds by Means of Creek Indian Customs, by John R. Swanton.
Friederich Kurz, Artist-Explorer, by David I. Bushnell, jr.
Note on the Principles and Process of X-Ray Examination of Paintings, by Alan Burroughs.
Lengthening of Human Life in Retrospect and Prospect, by Irving Fisher.
Charles Doolittle Walcott, by George Otis Smith.
William Healey Dall, by C. Hart Merriam.

SPECIAL PUBLICATIONS

Classified List of Smithsonian Publications Available for Distribution, September 15, 1927. Compiled by Helen Munroe. 29 pp. (Publ. 2922.)

List of Paintings, Pastels, Drawings, Prints, and Copper Plates by and attributed to American and European Artists together with a list of Original Whistleriana in the Freer Gallery of Art. March 20, 1928. 51 pp. (Publ. 2963.)

Handbook of the Health Exhibits of the United States National Museum under direction of the Smithsonian Institution. April 6, 1928. 39 pp., 19 figs.

Explorations and Field-work of the Smithsonian Institution in 1927. April 7, 1928. 188 pp., 213 figs. (Publ. 2957.)

REPRINTS

Phonetic Transcription of Indian Languages. Report of American Anthropological Association (Reprint). September, 1916. 15 pp., 2 charts. (Publ. 2415.)

The Origin and Antiquity of the American Indian. By Aleš Hrdlička. From the Smithsonian Report for 1923, pp. 481–494, 16 pls. Revised edition. (Publ. 2778.)

PUBLICATIONS OF THE UNITED STATES NATIONAL MUSEUM

The editorial work of the National Museum is in the hands of Dr. Marcus Benjamin. During the year ending June 30, 1928, the Museum published 1 annual report, 3 volumes of proceedings, 5 complete bulletins, 2 parts of a bulletin, 1 complete volume in the series Contributions from the United States National Herbarium, and 57 separates from the proceedings.

The issues of the bulletin were as follows:

Bulletin 76. Asteroidea of the North Pacific and Adjacent Waters. Part 2. Forcipulata (Part). By Walter Kenrick Fisher.

Bulletin 100. Contributions to the Biology of the Philippine Archipelago and Adjacent Regions. Volume 6, part 4. Report on the Echinoidea collected by the United States Fisheries Steamer "Albatross" during the Philippine Expedition, 1907–1910. Part I. The Cidaridae. By Theodor Mortensen. Volume 7. The Fishes of the Families Pomacentridae, Labridae, and Callyodontidae, collected by the United States Bureau of Fisheries Steamer "Albatross," chiefly in Philippine Seas and Adjacent Waters. By Henry W. Fowler and Barton A. Bean.

Bulletin 141. Collection of Heating and Lighting Utensils in the United States National Museum. By Walter Hough.

Bulletin 142. Life Histories of North American Shore Birds. Order Limicolae (Part 1). By Arthur Cleveland Bent.

Bulletin 143. Biological and Taxonomic Investigations on the Mutillid Wasps. By Clarence E. Mickel.

Bulletin 144. The American Bats of the Genera *Myotis* and *Pizonyx*. By Gerrit S. Miller, jr., and Glover M. Allen.

Of the separates from the proceedings, 12 were from volume 71, 25 from volume 72, and 20 from volume 73.

PUBLICATIONS OF THE BUREAU OF AMERICAN ETHNOLOGY

The editorial work has continued under the direction of the editor, Mr. Stanley Searles.

During the year one annual report and one bulletin were issued.

Forty-second Annual Report. Accompanying papers: Social Organization and Social Usages of the Indians of the Creek Confederacy (Swanton); Religious Beliefs and Medical Practices of the Creek Indians (Swanton); Aboriginal Culture of the Southeast (Swanton); Indian Trails of the Southeast (Myer). 900 pp., 17 pls., 108 figs.

Bulletin 85. Contributions to Fox Ethnology (Michelson). 168 pp.

Publications in press 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-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 86. Chippewa Customs (Densmore).

Bulletin 87. Notes on the Buffalo-Head Dance of the Thunder Gens of the Fox Indians (Michelson).

Bulletin 88. Myths and Tales of the Southeastern Indians (Swanton).

Bulletin 89. Observations on the Thunder Dance of the Bear Gens of the Fox Indians (Michelson).

Bulletin 90. Papago Music (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.

Part 2 of the annual report for 1922 was issued during the year. The annual reports for 1923, 1924, and 1925 and the supplemental volumes to the reports for 1924, 1925, and 1926 were in press at the close of the year.

REPORT OF THE NATIONAL SOCIETY, DAUGHTERS OF THE AMERICAN REVOLUTION

The manuscript of the Thirtieth Annual Report of the National Society, Daughters of the American Revolution, was transmitted to Congress, in accordance with the law, December 15, 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. Seven meetings were held during the year and 107 manuscripts acted upon.

Respectfully submitted.

W. P. True, *Editor.*

Dr. C. G. Abbot,
Secretary, Smithsonian Institution.

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APPENDIX 11

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