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REPORT

OF

S. P. LANGLEY,

SECRETARY OF THE SMITHSONIAN INSTITUTION:

FOR THE

YEAR ENDING JUNE 30, 1889.



WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1889.

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To the Board of Regents of the Smithsonian Institution:

GENTLEMEN: I have the honor to present the report upon the operations of the Smithsonian Institution for the year ending June 30, 1889, together with the customary summary of the work performed by the Bureau of Exchanges, the National Museum, and the Bureau of Ethnology.

THE SMITHSONIAN INSTITUTION.

THE BOARD OF REGENTS.

As the Annual Reports of the Secretary are intended to present a history of the affairs of the Institution, it seems proper to state that by the appointment of the Hon. Melville W. Fuller as Chief Justice of the United States, the latter became *ex officio* a regent of the Institution, and that at the annual meeting of the Board of Regents, held on the 9th of January, 1889, he was unanimously elected its chancellor.

The Hon. Levi P. Morton has become a Regent by his election as Vice-President, the holder of that high office being *ex officio* a Regent of the Institution.

The terms of Senator S. M. Cullom, appointed March 23, 1885, and Senator R. L. Gibson, appointed December 10, 1887, having expired on March 3 of the present year, those gentlemen were re-appointed by the President of the Senate.

The Board has lost from its number by death the Hon. S. S. Cox, long connected with the Institution; but this event having occurred since the expiration of the year which forms the subject of this report, the remarks called out by this great loss will be more properly made in a later communication.

FINANCES.

I have in my last report referred to the fact that owing to the changing value of money, the purchasing power of the Smithsonian fund, in the language of a committee of the Regents—

“while nominally fixed, is growing actually less year by year, and of less and less importance in the work it accomplishes with reference to

the immense extension of the country since the Government accepted the trust ;”

so that it seems most desirable that the fund should be enlarged, if only to represent the original position of its finances relatively to those of the country and institutions of learning, and nothing has occurred in the course of the last year which does not rather increase than diminish the force of such an observation. It is on the Congressional Regents that the Institution must largely depend for making its wants known to Congress, and with reference to the suggestion that the Smithsonian fund should be enlarged by re-contribution from the Government as well as from contributions from private individuals, I desire to repeat the remark of Professor Henry, made in 1872, to the effect that the Government, in equity, should *then* have paid the Institution \$300,000 for the use of the present building. This building, erected wholly out of Smithsonian funds, at the cost of over half a million dollars, has, with the exception of a small portion, continued to be used rent free by the Government ever since that time.

I recall briefly in this connection the well known facts that the will of James Smithson was made on October 23, 1826, and that by an act of Congress approved July 1, 1836, the bequest was accepted, while under the act of August 10, 1846, a definite plan of organization was adopted, and that finally, by the act of February 8, 1867, the Regents were authorized to add to the Smithsonian fund such other sum as they might see fit to deposit, not exceeding, with the original bequest, the sum of \$1,000,000.

The original bequest and the sums since added are as follows :

Bequest of Smithson, 1846	\$515, 169. 00
Residuary legacy of Smithson, 1867	26, 210. 63
Deposits from savings of income, etc., 1867	108, 620. 37
Bequest of James Hamilton, 1874	1, 000. 00
Bequest of Simeon Habel, 1880	500. 00
Deposit from proceeds of sale of bonds, 1881	51, 500. 00

Total permanent Smithsonian fund in the Treasury of the United States, bearing interest at 6 per cent. per annum

703, 000. 00

There may, therefore, be added to the fund nearly \$300,000, on which the Institution is entitled to receive 6 per cent. under the act of February, 1867, while it has received in bequests only the insignificant sum of \$1,500. This is in striking contrast to the liberality which is understood to have endowed more than one American institution of learning within this time with something like ten times the amount of the entire Smithsonian fund. No institution in the country, it is believed, enjoys wider measure of public confidence or is more universally known, and it would seem that some action might well be taken to bring these facts before those who are seeking a trustee for the disposition of means intended for the advancement of knowledge.

In this connection, however, it seems proper to invite the attention of the Regents to the circumstances of the bequest of James Hamilton,

who donated \$1,000 to the Institution in 1874, the interest on which was to be appropriated bi-ennially for a contribution, paper, or lecture on a scientific or useful subject. Your former Secretary, Prof. Joseph Henry, in his report for 1874, states that—

“The first installment of interest on the Hamilton bequest has just been received, and will be appropriated in accordance with the will of the testator at the end of next year, and so on continually at the end of every two years.”

And he adds—

“A statement of the manner of spending this income will be given in the accounts of the operations of the institution with due credit to the donor. His name will therefore appear from time to time in the annual reports and thus be kept in perpetual remembrance.”

Professor Henry continues, in this connection :

“When the public shall become more familiar with the manner in which the income of the additional bequests to the Smithsonian fund is expended, with the permanence and security of the investment, and with the means thus afforded of advancing science and of perpetuating the names of the testators, we doubt not that additions to the fund in this way will be made until it reaches the limit prescribed by law of \$1,000,000.”

Owing, perhaps, to the small amount of this bequest, the intent of the Secretary does not appear to have been fulfilled. No contribution, paper, or lecture seems to have ever been furnished, biennially or otherwise, and with the exception of the exploration of certain bone caves, mentioned in the report of the Secretary for 1876, the income has remained unexpended.

I shall have elsewhere to speak of the great loss the Institution has sustained in the death of Dr. J. H. Kidder, curator of exchanges; but I refer to it here only in connection with a bequest made by him, constituting the Institution one of his residuary legatees. This bequest, the terms of which are still awaiting the consideration of the Regents, will be more properly described, in detail, after their action upon it, which can not well form a portion of the present report.

At the beginning of the fiscal year the balance on hand of the income from the fund was \$4,809.23. The interest has been \$42,180, while from miscellaneous sources \$3,760.53 have been received. The total expenditures have been \$38,992.29, leaving on July 1, 1889, \$11,757.47, a somewhat larger balance than usual, which has been retained to meet certain delayed expenditures and also for the above-mentioned provision of the Hamilton bequest if the Regents see fit to give it effect.

The Institution is charged by Congress with the disbursement of sundry appropriations through the Secretary, as follows :

For international exchanges.....	\$15,000
For ethnological researches.....	40,000
For preservation of collections, National Museum.....	125,000
For furniture and fixtures, National Museum.....	40,000
For heating and lighting, National Museum.....	12,000

The vouchers for the expenditures from the appropriations are passed upon by the executive committee of the Board of Regents with the exception of those for ethnological researches. The disbursements from the latter appropriation are made under the direction of Major Powell.

The estimates prepared to be submitted for the fiscal year ending June 30, 1889, were as follows:

International exchanges	\$27,050
Ethnological researches	50,000
Preservation of collections	150,000
Furniture and fixtures	40,000
Heating and lighting	13,000

For which Congress appropriated as follows:

International exchanges	15,000
Ethnological researches	40,000
Preservation of collections	125,000
Furniture and fixtures	40,000
Heating and lighting	13,000

Of the first of these items, that of international exchanges, urgent representations were made to Congress to the effect that though it had assumed the charge of this, the expenditures of the Bureau (whose work largely consists of the transportation of Government documents) continue to be met, in part, from the private fund of the Institution, but, as will be seen, no change in this respect has been made.

The estimates prepared to be submitted for the fiscal year ending June 30, 1890, were as follows:

International exchanges.—Twenty-seven thousand and five hundred dollars was asked for; the House committee reported \$15,000; the Senate committee \$20,000; and the amount finally appropriated was 15,000.

North American Ethnology.—The appropriation asked for this service was \$50,000. The House reported \$40,000; the Senate made no change and the amount of the appropriation remained as reported by the House.

Preservation of Collections, U. S. National Museum.—The appropriation asked for this service was \$160,000. The House committee reported \$135,000; the Senate committee \$145,000. The amount finally appropriated was \$140,000.

Furniture and Fixtures, U. S. National Museum.—An estimate of \$35,000 was submitted. The House committee reported \$30,000; the Senate committee also reported \$30,000 and this amount was appropriated.

Heating and Lighting, U. S. National Museum.—The appropriation asked for this purpose was \$12,000. This amount was agreed to by the House and Senate committees. There is a deficiency of \$1,000 for the purchase of coal.

Living Animals, U. S. National Museum.—An estimate of \$5,000 was submitted for this service. The House did not report the same.

Postage-Stamps and Foreign Postal-Cards, U. S. National Museum.—An appropriation of \$1,000 was asked for this service. The same was reported from the Senate favorably, where it originated, and passed the House.

Publications, U. S. National Museum.—An estimate of \$15,000 was submitted for this service. The House reported \$10,000; the Senate

committee reported \$12,000; and in conference the amount as reported by the House was agreed upon.

In my last report I stated that it was desirable that the appropriations for the Museum should be made under the direction of the Institution, and no longer under the Department of the Interior, and I gave a correspondence with the honorable the Secretary of the Interior upon the subject. I am happy to state that the Secretary's assent being given the appropriations were transferred by Congress to the care of the Institution, and are now disbursed under direction of the Regents by a disbursing clerk in the Institution, whose bonds have been accepted by the Treasury Department.

A detailed statement of the expenditures for the fiscal year 1889, under appropriations for International Exchanges, North American Ethnology, and the National Museum is given in the report of the Executive Committee.

BUILDINGS.

It will be remembered that the Board of Regents in their meeting January 17, 1883, recommended to Congress the erection of a new building planned exclusively for museum purposes, and the steps taken in pursuance of their instructions were laid before the Regents in my last report, but I regret now to be unable to report any further progress.

The necessity for additional space for the storage of collections, independent of that demanded for exhibition purposes, is constantly becoming greater, while the assignment by the last Congress to the Fish Commission of the principal parts of the rooms occupied by the Museum in the Armory building has still further aggravated the crowded condition of the Museum exhibition halls and storage rooms, and I deem it my duty again to urge the necessity of the erection of a new building, if only for such requirements of storage as may be inferred from the following statements:

Since the erection of the present Museum building there have been nearly 14,000 accessions to the Museum, chiefly by gifts, such "accessions" representing frequently collections, and the collections including, in many cases, thousands of specimens. From the year 1859 to 1880 the accessions numbered 8,475. It is thus evident that during the last nine years the accessions have exceeded by more than 5,000 those of the previous twenty-one years.

Among the more recent collections are several of very great extent, such as the bequest of the late Isaac Lea, of Philadelphia, which contains 20,000 specimens of shells, besides minerals and other objects; the Jeffries collection of fossil and recent shells of Europe, including 40,000 specimens; the Stearns collection of mollusks, numbering 100,000 specimens; the Riley collection of insects, containing 150,000 specimens; the Catlin collection of Indian paintings, about 500 in number; the collection of the American Institute of Mining Engineers, for the

transportation of which to Washington several freight-cars were required; the Shepard collection of meteorites; the Wilson collection of archæological objects, more than 12,000 specimens; the Lorrillard collection of Central American antiquities, and very many others nearly as extensive.

In addition to these are the extensive collections obtained at the close of the exhibition in Berlin, London, and New Orleans, the annually increasing collections transferred to the Museum by the U. S. Geological Survey, the U. S. Fish Commission, and the Bureau of Ethnology, besides numerous contributions resulting from Government expeditions as well as those made by officers of the Army and Navy, and other Government officials.

The storage sheds contain many hundreds of boxes of valuable material which we have not room to unpack, and the great vaults under the Smithsonian building, and many of the attic and tower rooms are similarly crowded.

The growth of several of the most important departments in the Museum is seriously retarded owing to the fact that no exhibition space is available for the collections, and that there is not even storage room where incoming material can be properly cared for.

The collection of birds, which so far as North America is concerned, is the finest in the world, and now numbers nearly 60,000 specimens, is very inadequately shown, and requires double the case room now available.

The collection of mollusks, which is one of the most complete in the world, and contains nearly 470,000 specimens, is at present almost entirely unprovided for.

The collection of insects, now numbering over 600,000 specimens, is so far as North America is concerned, equally perfect, but is practically without any exhibition space.

The same is equally true in regard to the collections of birds' eggs (more than 50,000 specimens), of reptiles (nearly 30,000 specimens), of marine invertebrates (more than 515,000 specimens), of invertebrate fossils (more than 160,000 specimens), and of fossil and recent plants (nearly 50,000 specimens).

Many valuable collections elsewhere than in Washington are at the service of the Museum, but lack of space has compelled us to decline to receive them.

It should be borne in mind that under the roofs of the Smithsonian and the new Museum buildings are grouped together collections which, in London, Paris, or any other of the European capitals, are provided for in different museums, for the accommodation of which a much larger number of equally commodious buildings is found needful.

The necessity for additional space then is constantly becoming greater, and there is the further reason that by the action of the last Congress the Armory building, assigned to the uses of the Museum in 1876, and

for several years past occupied in part by the U. S. Fish Commission, as a fish-hatching station, was assigned to this Commission for headquarters. It has been refitted as an office building, and is now almost entirely relinquished by the Museum, four apartments on the third floor being retained for the use of a part of the Museum taxidermists.

From the inadequate exposition of our needs just made, it will be apparent that an extensive additional building is needed, if only for storage, and where purposes of immediate exhibition are not in question.

Irrespective of the construction of this proposed building, however, I beg to urge the necessity of improving the lighting of the second floor of the main hall of the Smithsonian building, and more particularly the indispensability of fire-proofing the west wing, which I have already urged upon the attention of the Regents, and concerning the latter of which, one of their number, Senator Morrill, introduced a bill in the Senate on June 12, 1888, which is referred to in my last report, and on which no further action has been taken by Congress.

In regard to erections of minor importance, it may be mentioned that it is intended to put up a small wooden building of one story, of a temporary character, immediately south of the main building, as a cover for the instruments, which at the same time will render it possible to make certain observations pending the building of the proposed physical observatory, and this is more particularly alluded to under the following head of Research.

RESEARCH.

In my last report I spoke of the preparations made by the late Secretary for securing an astro-physical observatory and laboratory of research, and I mentioned that through his action some friends of the Institution had already offered to give the means for the erection of the simple structure needed for the accommodation of such a special observatory. I added that the site would necessarily be suburban on account of the special need of seclusion and the absence of tremor in the soil.

I have elsewhere referred to the collections of the Institution in connection with the purchase by Congress of a zoological park, which it would appear to have been the first intent of Congress to place under the care of the Regents. It had been my hope in that case to place this observatory somewhere in the park, but in view of the long delay which has already arisen, and of the indefinite further delay which may occur, I have thought it better to put a wooden structure of the simplest and most temporary character in grounds immediately south of the Institution, although this site is quite unsuitable for a permanent building. Such a shelter will probably be erected before the coming winter, and will, while serving as a store-house for the apparatus, enable observations to be commenced.

The promotion of original research has always in the history of the Institution been regarded as one of its most important functions, and the proper object of the personal attention of the Secretary; and I shall be very glad to do something in this direction on the most modest scale, rather than incur the chance of indefinite further delay.

In this connection I desire to say that a valuable collection of recently constructed apparatus, most of it exactly suited to the wants of the proposed laboratory, and which was the property of the late William Thaw, of Pittsburgh, has been, by his wish and the consent of his executors, loaned to the Institution for use in this direction.

Comparatively few of the collections of the Institution or of the Museum have reference to the physical sciences. The apparatus collected by Professor Henry, together with some few archaic instruments illustrating the early history of methods of precision which I have added, are now being placed in the south hall of the main building, and it will gratify me to see this lead to accessions in illustration of the history of research in all branches of science.

EXPLORATIONS.

The Smithsonian Institution has during the year enjoyed the valuable assistance of several persons who have expressed their willingness to prosecute special researches in its behalf, or have generously offered to allow the Museum to share in their results.

In embracing these opportunities it has been the policy of the Institution to endeavor to obtain information and, when possible, to secure specimens, in regard to subjects in which the Museum collections were most deficient, and thus to fill some of the most important gaps in special collections rather than to obtain large collections of miscellaneous material.

Mr. Talcott Williams, of Philadelphia, visited the northern part of Africa early in the present year, and, before going, kindly offered to make special inquiries in regard to the civilization of the modern Arabs and the natural history of the region, and to collect, if possible, linguistic specimens. It was his intention to journey direct to Tangiers, thence to Fez and Mequinez, continuing, if time permitted, as far as Mogador and Morocco. Mr. Williams is familiar with the Arabic language, which will greatly facilitate his investigations in that country. The region has rarely been visited by naturalists, and the Smithsonian Institution will no doubt obtain very important information, and probably also some valuable collections. The special studies to which Mr. Williams intends to devote himself are botany, geology, and archæology. At the time of his arrival the North African flora was in flower, so that his opportunities in the first direction were excellent. The geology of Northern Africa is poorly represented in the National Museum, and characteristic rocks and photographs of feature of physical geology will be very acceptable. The subject of most importance to the Smith-

sonian Institution, however, is the archæology of this region, and it is to this that Mr. Williams has been requested to chiefly direct his attention. It is his intention to visit El Kutel, one of the most striking monolithic remains in Northern Africa, and other ruins of equal interest. Photographs and measurements will be obtained, for which purpose a photographic outfit has been furnished to Mr. Williams, who is thoroughly competent to conduct investigations of this kind. The Smithsonian Institution has also provided an outfit of instruments for taking observations of temperatures and altitudes, and he has been requested to obtain musical instruments of all kinds, as far as the limited sum of money placed at his disposal from the Museum fund will enable him to purchase them.

News has already been received of Mr. Williams's arrival in Africa. He has secured a complete series of musical instruments, from the rudest whistle to stringed instruments of skillful manufacture. In each instance the native names and names of the parts have been ascertained, the proper pitch of each string taken, and a native melody, as played on each kind of instrument, has been noted in our musical notation. He has also succeeded in obtaining a varied collection of objects illustrating the domestic life of the people.

Mr. W. W. Rockhill, of the German legation of Peking, has for several years made himself familiar with the customs of the natives of Thibet, and having recently undertaken a journey through that country, will make a special study of the ethnology of the region. He has been supplied by the institution with a barometer and other instruments desired by him for his journey. His previous investigations have resulted in an exceedingly valuable collection of objects illustrating the religious practices, occupations, and amusements of various peoples in different parts of China, Thibet, Turkestan.

Dr. James Grant Bey, who some years ago established a sanitarium in Cairo, Egypt, and attended the International Medical Congress held in Washington in 1887, became much interested in the work of the National Museum, and has since his return to Egypt devoted his leisure time to special studies of the arts of the ancient Egyptians. Several valuable collections have already been received from him.

During the summer, the Bureau of Ethnology decided to send Mr. Jeremiah Curtin to Hoopa Reservation in California for the purpose of studying the languages and mythology of the tribes of Indians inhabiting the reservation. The Smithsonian Institution was fortunately enabled to secure the assistance of Mr. Curtin in investigating their arts and industries also, and a small sum of money was placed in his hands for the purchase of objects of Indian manufacture.

Dr. John M. Crawford, U. S. consul-general at St. Petersburg, has kindly offered to allow the National Museum to participate in the results of his ethnological researches in Russia and Finland. Dr. Crawford is well known in the United States as a philologist and a student of Scan-

Finlandian antiquities, and as the author of the English translation of the Finnish epic "The Kalevala." His appointment as consul-general at St. Petersburg was made with a special view to enable him to carry on his studies of the traditions and antiquities of the Finnish race and related peoples. He has offered to make collections for the National Museum, and in order to facilitate his work, the Smithsonian Institution has provided him with letters of introduction to several of its correspondents in Russia and Finland. These will no doubt be of great service to him in enabling him to carry out the object which he desires to further.

Rev. Frederick H. Post, an Episcopal clergyman of Salem, Oregon, has recently undertaken missionary work in Alaska, and has taken up his residence at Anvik, on the Yukon River. He has entered into correspondence with the Smithsonian Institution, and has offered to collect information relating to the tribes of the Upper Yukon. He has also proposed to make meteorological observations at Anvik. This offer has been referred to the Signal Office. It is probable that an outfit of alcohol, guns, and ammunition will be sent to Mr. Post next year to enable him to collect the mammals and birds of that region.

Lieut. J. F. Moser, commanding the U. S. Coast Survey steamer *Bache* has continued his explorations for the Museum, and has transmitted a collection of fishes, mollusks, insects, and marine invertebrates from the vicinity of Cape Sable, Florida.

Prof. O. P. Jenkins, of De Pauw University, Indiana, has made arrangements to visit the Hawaiian Islands for the purpose of collecting fishes, and has expressed his intention of presenting a duplicate series of specimens to the National Museum. The Smithsonian Institution has supplied him with seines and has furnished him with a letter of introduction to the curator of the national museum in Honolulu.

Ensign W. L. Howard, U. S. Navy, has kindly offered to collect zoological and ethnological material in Alaska, and has been supplied with collecting apparatus and supplies for use in trading with the Indians.

A large outfit of tanks, bottles, and alcohol was supplied to Mr. W. A. Stearns, of Cambridgeport, Mass., for use in collecting specimens of natural history in northern Labrador. No collections have yet been received from him.

PUBLICATIONS.

Under an arrangement made by the late Secretary, Prof. E. D. Cope was engaged at the time of my last report in completing and preparing for publication an investigation upon the Reptilia and Batrachia of North America, which has been in progress, under the direction of the Smithsonian Institution, for more than twenty years. The monograph on the Batrachia, mentioned in my last report as having been received, is now in type, though not yet published, but that on the Reptilia is still

delayed. I have positive assurance from Professor Cope that it will be completed within the present year, but the expense entailed in the publication has continued to prove far greater than the late Secretary had anticipated, and I am sorry that the expectation of its completion during the past year has not been fulfilled.

I have referred in my last report to the demand for greater economy in publication, and to the probability that some change would be requisite in the form of the annual reports. It will be remembered that the Smithsonian Institution has three classes of publications:

The Contributions to Knowledge.

The Miscellaneous Collections.

The Annual Reports.

A brief review of the past and present condition of each of these publications may here be made, with special reference to the latter. For details concerning these different classes, and for the matter actually presented under each, reference may be made to the appendix.

Smithsonian Contributions to Knowledge.—The first work of original research published by the Institution was the well-known treatise by Messrs. Squier and Davis, in 1848, on Ancient Monuments of the Mississippi Valley. This was the commencement of the quarto series entitled "Smithsonian Contributions to Knowledge," which now numbers twenty-five volumes. This series is designed to record the results of original research, offering positive additions to human knowledge, either undertaken by agents of the Institution or encouraged by its assistance. In general character these contributions correspond somewhat with the more elaborate transactions of learned societies. From causes briefly adverted to in my last report, original memoirs deemed worthy of a place in this series have been much rarer in later years than in the earlier portion of the Institution's history.

Smithsonian Miscellaneous Collections.—In 1862, a second series of publications was commenced by the Institution, in octavo form, with the Meteorological and Physical Tables of Professor Guyot, under the title of "Smithsonian Miscellaneous Collections." This series embraces papers or treatises of a more practical character than those of the Contributions, including résumés of existing knowledge in special departments, systematic lists or classifications of species in the animal, botanical, or mineral kingdoms of nature, tabular collections of natural constants, scientific bibliographies, and other summaries, of value to the students of physical or biological science. These collections now number thirty-three volumes.

Among the subjects heretofore included in this series have been the proceedings or transactions of several scientific societies of Washington (the Philosophical, the Anthropological, and the Biological), which were organized under the auspices of officers of the Smithsonian Institution. To promote their usefulness the stereotyping of their several published

journals was undertaken by the Institution and a large extension of their distribution was thus effected by including their re-issue in the Miscellaneous Collections, of which series they constitute three volumes. These societies having now severally attained a highly successful and self-supporting condition of active membership, it has been thought that this form of patronage might well be withdrawn without detriment to the welfare of the societies and with advantage to the Institution. These publications are accordingly no longer stereotyped by the Institution, or included in its issues.

The Bulletins and Proceedings of the U. S. National Museum, published by an appropriation of Congress, have also been heretofore reprinted by the Institution and this supplementary edition has occupied five volumes of the Miscellaneous Collections. It has been decided in like manner to hereafter omit these publications from the series.

Smithsonian Annual Reports.—A provision of the act of Congress organizing the Smithsonian Institution (Revised Statutes, Title 73, Sec. 5593) requires that "the Board shall submit to Congress at each session thereof a report of the operations, expenditures, and condition of the Institution." These annual reports have been accompanied with a "general appendix," giving summaries of lectures, interesting extracts from the correspondence, and accounts of the results of explorations undertaken by the Institution or aided and promoted by it, as well as of new discoveries in science. In the annual report for 1880 and the following years my lamented predecessor undertook to give a more systematic character to the history of discoveries, by engaging a number of able collaborators in various fields of knowledge, to furnish a general summary or record of scientific progress for the year. Appropriate as the scheme appears, it has not been found to work as satisfactorily as is desirable, and as had been hoped for. It has seldom been possible to collect as complete summaries as were originally contemplated; and the delay of publication deprives the record of much of the freshness and interest it would otherwise possess, while in all these the rapid increase of scientific literature demanded such a corresponding increase in the corps of reporters and such a correlatively increasing expenditure as the fixed Smithsonian fund was growing quite unable to afford. It will be remembered that of this appendix there are distributed through members of Congress as many as 9,000 copies, forming the larger part of the whole edition, and that it is thus incumbent on us to observe that it reaches a large class of readers unable to follow the work of specialists in original memoirs.

After serious consideration it has been finally determined to restrict, if not forego, the scheme of a general annual survey of scientific literature and progress, and to recur in large part to the system of Henry of selecting memoirs of a special interest and permanent value, which have already appeared elsewhere and which are sufficiently untechnical

to be readily apprehended by readers fairly representative of the intelligent and educated class among the constituents of the members of Congress, by whom they are chiefly distributed.

If, as I have already suggested, Congress sees fit to make a small appropriation for the editing as well as the publication of this appendix, so as to enable it to include, for instance, information relative to the progress of scientific discovery and its useful application in the United States, such a record would be in keeping with the objects of this Institution, and would maintain for this report the popularity and the educational character just referred to, while promoting industrial interests in the country.

In this connection I beg to repeat the remark that it would be desirable to have the supplementary matter of the report placed under a special clause for the avoidance of all question as to the "necessity and entire relation to the public business" of such information, a question which has arisen by the construction given by the Public Printer to the act of Congress of August 4, 1886.

Publications of the National Museum.—These publications (already referred to as being issued by Government appropriations) comprise two series: First, the "Proceedings of the National Museum," consisting of short essays giving early accounts of recent accessions, or newly ascertained facts in natural history, and promptly issued to secure the earliest diffusion of the information, of which series ten annual volumes have now been issued; and secondly, the "Bulletins of the National Museum," consisting of more elaborate memoirs relative to the collections, such as biological monographs, taxonomic lists, etc., of which series thirty-six numbers have been issued. These bulletins vary greatly in size from pamphlets of fifty pages to works of many hundred pages.

Publications of the Bureau of Ethnology.—The principal publication of this Bureau is the "Annual Report." This series consists of large royal octavo volumes, detailing researches relative to the aborigines of North America, handsomely printed and illustrated with numerous cuts and lithographic plates. The fifth Annual Report has been issued during the year, and the series may be referred to, as at the same time creditable to the Government and as fitted to engage public attention by matter of an interest beyond what is ordinarily found in any Government document.

Distribution of Smithsonian Publications.—It is manifestly impossible for the Institution, with its fixed and limited income, to keep pace in its issues and their distribution with the increase of popular interest in scientific productions. The ordinary edition of 1,500 copies of each of the Smithsonian publications which has been produced from the beginning, cannot be enlarged without seriously impairing the efficiency

of the fund for other services ; although it would be a great satisfaction to be able to supply more liberally the growing demand for the works as published. The impracticability, however, of furnishing these to all interested in scientific pursuits, has required the adoption of more formal regulations to secure the most judicious application of the available stock of publications. These are presented, first, to those learned societies of the first class which give to the institution in return complete sets of their own publications ; secondly, to colleges of the first class furnishing catalogues of their libraries and students, and publications relative to their organization and history ; thirdly, to public libraries in this country having 25,000 volumes ; fourthly, in some cases to still smaller libraries, especially if no other copies of the Smithsonian publications are given in the same place and a large district would be otherwise unsupplied ; lastly, to institutions devoted exclusively to the promotion of particular branches of knowledge, such of its publications are given as relate to their special objects. These rules apply chiefly to distribution in the United States. The number sent to foreign countries, under somewhat different conditions, is about the same as that distributed in this country.

A small number of copies not otherwise disposed of has been usually reserved for sale ; although such returns have of course contributed but little toward the cost of production. As an experiment (which had been tried in the early history of the institution), I have placed a small edition of one of our works in the hands of a large publishing house, the well-known firm of MacMillan & Co., of London and New York. The work selected for this purpose is the newly revised "tables of specific gravity for solids and liquids," by Prof. F. W. Clarke, Chemist of the U. S. Geological Survey. This being a valuable work of reference for all practical chemists, as well as for many others, was thought to be a very suitable subject for trial as to its commercial success. An edition of 1,000 copies having been reserved for the regular gratuitous distribution, 500 copies were prepared with the imprint of Messrs. MacMillan & Co. on the title page, to be disposed of as one of their own publications, and by their regular business methods.

Facilities afforded to others.—A few instances of assistance in the direction of printing, etc., granted in special cases, may here be mentioned. The widow of Dr. Asa Gray having about 80 imperfect copies on hand of her husband's "Flora of North America," desired, in order to complete her sets and render them available for sale, a corresponding number of copies of the first part of the second volume. The request was cheerfully complied with, and Messrs. Wilson & Son, of Cambridge, Mass., were authorized by the Regents to print the desired small edition at the expense of the Institution.

Prof. M. W. Harrington, of Ann Arbor, Mich., made application for the use of the stereotype plates of Professor Henry's meteorological

essays (included in his published scientific writings), with a view to the publication of a cheap popular edition of this treatise. In the belief that such a republication would be in the interests of science and its wider diffusion, permission to use the plates was readily granted.

A similar request was made by Dr. George H. Horn, of Philadelphia, who, as joint author with the late Dr. John L. Le Conte of a work of 600 pages on the "Classification of the Coleoptera of North America" (published by the Institution in 1883, and now out of print), desired the use of the stereotype plates, from which to print an edition of the book. This request was also favorably entertained, and the privilege sought was conceded.—

The Eighth International Congress of Orientalists, appointed to be held at Stockholm and at Christiania, in September, 1889, solicited through its officers the co-operation of the Smithsonian Institution. In furtherance of its laudable aims the Institution undertook to print and distribute in this country 1,000 copies of its circular of announcement and information.

In compliance with the request of Mr. Sylvester Baxter, secretary of the Hemenway Expedition of exploration, the privilege of the Smithsonian exchange system was granted for the distribution of the report of the expedition, giving an account of its researches in the Southwest.

These various allowances are believed to be in the spirit of the Smithsonian foundation, and of its ancient maxim—"Co-operation, rather than rivalry or monopoly."

Storage of the Smithsonian Stereotype Plates.—The stereotype plates of the Smithsonian publications now constitute a very large collection, and as the printing of the works had been done in various cities, as appeared most economical or convenient, a considerable portion of this material had been stored in Boston, and especially in Philadelphia. As the fire-proof renovation of the eastern portion of the Smithsonian building furnished a safe and suitable depository in the basement rooms, these plates have now all been collected within its store-rooms.

THE SMITHSONIAN EXCHANGE SYSTEM.

The international exchange system was established early in the history of the Institution, at first purely as a channel for the interchange of scientific publications and specimens, and therefore as a direct means for "the diffusion of knowledge," a means which has proved to be a great benefit to the scientific institutions of the world, and incidentally to Congress in building up the unequalled collection of works of reference deposited in its Library.

Of late years, however, the Government, having assumed the charge of this system, has made the Institution its agent not only for this scientific distribution but for the much larger distribution of the publications of the United States Government abroad, and also for the receipt and transmission to the Library of Congress of the publications

of other countries sent in return. In this twofold service it is now performing an important public duty, for which such inadequate provision is made, that in spite of the efforts for an economical and efficient administration of this department the best interests of the Government as well as those of the Institution are seriously suffering.

In reviewing the past year it is necessary to mention first of all the serious loss in the death of Dr. Jerome H. Kidder, which however has been more fully referred to elsewhere. At the date of his death, which occurred on the 6th of April, 1889, owing to the efficient condition of the division due to the hearty co-operation of all in it with the labors of its lamented chief, the office was free from any parcels whatever, and was ready to close its book accounts completely for the first time.

I regret to record, also, the death on June 17, 1889, of Mr. George Hillier, superintendent of the New York Custom-House. Mr. Hillier had for more than thirty years attended to the transmission of Smithsonian exchange packages, rendering the Institution most valuable and efficient service without compensation. In response to a request made to the Secretary of the Treasury, Mr. Quackenbush, chief entry clerk of the New York Custom-House, has been designated to receive and transmit cases addressed to the Smithsonian Institution in future.

Dr. Kidder was succeeded as curator of exchanges by Mr. William C. Winlock, who was appointed May 15, 1889. The curator's report to the Secretary, containing the usual statistics for the fiscal year, will be found in the appendix.

In order to convey an idea of the present magnitude and character of the exchange transactions it may be stated that during the year, 17,218 packages were mailed to correspondents in the United States and 693 boxes, containing 58,035 packages, were shipped to our agents abroad for distribution to correspondents in nearly every civilized nation of the earth. The total number of packages received was 75,966, of which 34,996, or nearly one-half, were governmental exchanges.* The services of eleven clerks and packers have been required in handling and accounting for this material and in conducting the extensive correspondence that such a business involves. The societies and individuals upon the exchange list now number 13,130.

The entire expense of "international exchanges" for the fiscal year was \$17,152.10.† Of this sum \$15,000 were appropriated directly by Congress, \$1,363.54 were repaid by several of the Government Depart-

*It should be noted that almost from the very beginning of the exchange system the publications of several of the scientific bureaus of the Government were voluntarily transmitted by the Smithsonian Institution; but it was not officially designated for the service till 1878.

† It is not superfluous to repeat that these are engaged in addition to the proper personnel of the Institution, the services of whose officers are given without charge.

‡ The items \$2,329.99, under the head of expenditures for exchanges, and \$2,189.52 repayments, in the report of the executive committee, include receipts and expenditures made on account of the preceding fiscal year.

ments to which appropriations had been granted for payment of freight on publications sent abroad through the Institution, leaving a deficit of \$788.56, which was paid from the Smithsonian fund.

With reference to this deficiency let me observe that in the history of the Government's connection with the exchanges three periods may be distinguished. The first was in 1867 and 1868, when, after twenty years of useful work in the interests of knowledge, a new duty was imposed upon the service by acts of Congress* which established for the benefit of the Congressional Library an international exchange of works published by the Government and made the Smithsonian Institution the agency for this exchange. The second was in 1878, when the Institution was distinctly recognized† by the Department of State as the agent of the United States in the exchange of all Government publications (including exchanges for the benefit of Bureau libraries) and *also* in the exchange between learned societies.

The Institution possessed unequalled experience and facilities for such work, and though the new class of books brought to the exchange department was partly foreign to its original object, the propriety of its assuming such a service, if the Government's interest could be promoted by this experience, is evident. It certainly, however, was not to have been anticipated that the Institution should conduct a purely administrative work of the General Government out of its private funds, as it appears to have done for thirteen years, from 1868 to 1881, when the first appropriation of \$3,000 was made by Congress.

In the act‡ of March 3, 1881, making this appropriation it appears to have been the intent of Congress to apply the amount indifferently to all exchanges, whether to those which it undertakes for the Library of Congress, to those of Governmental bureaus, or to other literary and

* Statutes at Large, vol. 14, p. 573, Thirty-ninth Congress, second session, resolution 55. Statutes at Large, vol. 15, pp. 260, 261, Fortieth Congress, second session, resolution 72.

† Letter from Hon. Wm. M. Evarts, Secretary of State, to the Secretary of the Smithsonian Institution. Smithsonian Annual Report for 1881, p. 785.

‡ "International exchanges, Smithsonian Institution, 1882: For the expense of exchanging literary and scientific productions with all nations by the Smithsonian Institution, \$3,000 (act March 3, 1881)." This was changed in 1883 to the following: "International exchanges, Smithsonian Institution, 1883: For expenses of the international exchanges between the United States and foreign countries, in accordance with the Paris convention of 1877, including salaries and compensation of all necessary employes, \$5,000 (sundry civil act August 7, 1882)," and in 1886 it again was changed to "International exchanges, Smithsonian Institution, 1886: For expenses of the system of international exchanges between the United States and foreign countries, under the direction of the Smithsonian Institution, including salaries or compensation of all necessary employes, \$10,000 (sundry civil act March 3, 1885)."

scientific objects, thus constituting a third change* in the relations of the Smithsonian to the Government in regard to the Exchange Bureau.

An approximate estimate of the cost of the exchange for the Library of Congress from 1868 to 1878, together with the cost of the "Governmental" exchange (the Congressional and Departmental) for 1879 and 1880, shows that about \$20,000 were paid from the Smithsonian funds for handling Government property alone. Regarding the whole expense of international exchanges since 1881 as a charge on the Government, the entire amount paid out of the funds of the institution on account of the General Government is somewhat over \$50,000, exclusive of office rent and minor expenses.

In the report that I had the honor to submit to the Board of Regents at their last meeting the expenses and needs of the exchange department were dwelt upon at some length, and it was stated that a revised estimate of \$27,050 had been submitted through the Secretary of the Treasury for the purpose of meeting the expenses of contemplated improvements in the service during the fiscal year 1888-'89. The amount finally appropriated was \$15,000, an increase of only \$3,000 over the sum appropriated for the year preceding. As I have already remarked, in spite of efforts for an economical and efficient administration of the department, slow transportation and free ocean freight, this was \$2,152.10 less than the service actually cost, and the interests of both the Government and the Institution suffer from the entire inadequacy of the appropriation.

Although all of the Government bureaus that have occasion to transmit their publications through the Institution are not provided with funds available for defraying the cost of the service, it seems to have been the intention of Congress that its specific appropriation for the exchange business should be supplemented by special appropriations to some of the bureaus and departments of the Government, so that the charge of 5 cents per pound weight imposed by the regents in 1878 might be met by them. The average amount annually repaid to the Institution in this way during the past eleven years has been about \$1,400, and does not represent all the cost to the Institution which has been made up from its private fund.

It has been repeatedly urged that this procedure, for which sufficient reasons existed at the time of its adoption, may now be discontinued as no longer advantageous or economical.

By the present system the cost of the service is actually larger than appears in the specific appropriations for exchanges, and as the special appropriations to the different departments vary from year to year, and are often omitted altogether, a burden which can not be accurately foreseen continues to be imposed upon the Smithsonian fund.

* A convention, at which the United States was represented, was concluded at Brussels March 15, 1836, for establishing a system of international exchanges of the official documents and of the scientific and literary publications of the states adhering thereto.

In order to effect the change contemplated, that is, to collect in a single item the entire appropriation for international exchanges and at the same time to make allowance for a needed compensation to the ocean steam-ship companies for freight and for like necessary expenses, tending to secure to the United States a return of many times what they now receive from foreign governments, with a prompt delivery, an estimate of \$27,500 was submitted for the fiscal year 1889-'90.

It should be premised that only about one-third of the Government's publications are actually received from the office of the Public Printer and elsewhere for transmission abroad, and that while special application on our part might call out the remainder, we can not undertake to do this while only partly paid the actual outlay for the portion we carry already, while a sufficient appropriation to justify the employment of a special exchange agent in Europe, as has been frequently and earnestly recommended by the Librarian of Congress, would bring back in return probably about eight times what we now receive. Accordingly, in the subjoined estimate of what could be done if Congress paid the actual cost of efficient service (the services of the officers of this Institution being given without charge), more packages appear under the new plan than under the old.

Statement of exchanges during the fiscal year ended June 30, 1889, together with estimates for proposed new departure.

I. *Amount of exchanges sent abroad.*

	Old plan, 1888-'89.	New plan (esti- mated).
Congressional.....	22, 673	40, 000
Departmental.....	2, 998	30, 000
Society and private.....	32, 364	35, 000
	58, 035	105, 000

The receipts from abroad would then probably be more than double.

II. *Time.—Average time in transit to western Europe.*

	Slow freight.		Fast freight.
	Extremes.	Average.	
	<i>Days.</i>	<i>Days.</i>	<i>Days.</i>
England.....	47 to 21	37	16
Germany.....	47 to 30	36	15
France.....	47 to 24	36	17

This sum of \$27,500 asked for would have been divided somewhat as follows :

Salaries	\$16,600
Transportation :	
From Washington to sea-board	\$2,280
Ocean freight	5,000
From point of debarkation to destination	1,750
	9,030
Boxes	950
Incidentals	920
	27,500

No increase, however, over the amount appropriated for 1887-'88 (\$15,500) was granted, and it is probable that the deficiency for the coming year will be at least \$2,000.

Recurring now to one of the effects of the insufficient appropriations the writer repeats that there are too many and too great delays in the transit of packages sent by international exchanges. These delays do not occur in the office at Washington, nor in those of the agents of the Institution at London and Leipzig. They are due, broadly speaking, to the fact just stated, that the Institution has not the means to pay for rapid transit on land or sea, and that for what it obtains on the latter it is dependent upon the courtesy of several ocean steam-ship companies, with the natural result that the free freight is often delayed to make room for that which is paid for. A subordinate cause, however, lies in the apathy or indifference, or possible insufficient clerical force, of most of the foreign exchange bureaux.

The employés of the bureau are paid much lower salaries than similar services command in other branches of the public service, and the Government pays no rent for the rooms in which they labor, in which even the office furniture forms a part of the charge on the private funds of this Institution.

The convention between the United States of America, Belgium, Brazil, Italy, Portugal, Serbia, Spain, and Switzerland for the international exchange of official documents and scientific and literary publications, as well as the convention between the same countries (excepting Switzerland) for "the immediate exchange of the official journals, parliamentary annals, and documents," was concluded at Brussels March 15, 1886, ratification advised by the Senate June 18, 1888, ratified by the President July 19, 1888, ratifications exchanged January 14, 1889, and proclaimed January 15, 1889, and since that date formal notification has been received of the adhesion to both conventions of the Government of Uruguay. The full texts of these conventions were given in the Curator's report for last year.

The adhesion of the United States to the first convention involves no new departure in the exchange service from the methods of previous years ; but for the fulfillment of the obligations incurred by the second

convention—the immediate exchange of official journals—an appropriation of about \$2,000 to cover the necessary postage and additional clerical assistance is required, and provision should be made for the prompt delivery to the exchange office of the documents referred to.

This sum of \$2,000 was estimated in reply to an inquiry made by the Secretary of State, dated February 12, 1889, as to the ability of the Smithsonian Institution to execute all of the provisions of the two conventions without further legislation by Congress, and the estimate was duly transmitted by the Secretary of State in a letter to the President of the Senate, but no appropriation was made.

As heretofore, the Institution is greatly indebted to the lines of ocean steamers between the United States and other countries, and especial acknowledgment is due to the agencies of the following companies for the continuation of many favors in the free transportation of international exchange packages :

- Allan Steam-ship Company (A. Schumacher & Co., agents), Baltimore.
- Anchor Steam-ship Line (Henderson & Brother, agents), New York.
- Atlas Steam-ship Company (Pim, Forwood & Co., agents), New York.
- Bailey, H. B., & Co., New York.
- Bixby, Thomas E., & Co., Boston, Mass.
- Borland, B. R., New York.
- Boulton, Bliss & Dallett, New York.
- Cameron, R. W., & Co., New York.
- Compagnie Générale Transatlantique (L. de Bébien, agent), New York.
- Cunard Royal Mail Steam-ship Line (Vernon H. Brown & Co., agents), New York.
- Dennison, Thomas, New York.
- Florio Rubattino Line, New York.
- Hamburg American Packet Company (Kunhardt & Co., agents), New York.
- Inman Steam-ship Company, New York.
- Merchants' Line of Steamers, New York.
- Muñoz y Espriella, New York.
- Murray, Ferris & Co., New York.
- Netherlands American Steam Navigation Company (H. Cazaux, agent), New York.
- New York and Brazil Steam-ship Company, New York.
- New York and Mexico Steam-ship Company, New York.
- North German Lloyd (agents, Oelrichs & Co., New York; A. Schumacher & Co., Baltimore).
- Pacific Mail Steam-ship Company, New York.
- Panama Railroad Company, New York.
- Red Star Line (Peter Wright & Sons, agents), Philadelphia and New York.
- White Cross Line of Antwerp (Funch, Edye & Co., agents), New York.
- Wilson & Asmus, New York.

LIBRARY.

I may best preface what I have to say about the library by a repetition of some introductory remarks in my previous report :

“Chiefly through its exchange system, the Smithsonian had in 1865 accumulated about forty thousand volumes, largely publications of learned societies, containing the record of the actual progress of the

world in all that pertains to the mental and physical development of the human family, and affording the means of tracing the history of at least every branch of positive science since the days of revival of letters until the present time.*

"These books, in many cases presents from old European libraries and not to be obtained by purchase, formed even then one of the best collections of the kind in the world.

"The danger incurred from the fire that year, and the fact that the greater portion of these volumes, being unbound and crowded into insufficient space, could not be readily consulted, while the expense to be incurred for this binding, enlarged room, and other purposes connected with their use threatened to grow beyond the means of the Institution, appear to have been the moving causes which determined the Regents to accept an arrangement by which Congress was to place the Smithsonian Library with its own in the Capitol, subject to the right of the Regents to withdraw the books on paying the charges of binding, etc. Owing to the same causes (which have affected the Library of Congress itself) these principal conditions, except as regards their custody in a fire-proof building, have never been fulfilled.

"The books are still deposited chiefly in the Capitol, but though they have now accumulated from 40,000 to fully 250,000 volumes and parts of volumes, and form without doubt the most valuable collection of the kind in existence, they not only remain unbound, but in a far more crowded and inaccessible condition than they were before the transfer. It is hardly necessary to add that these facts are deplored by no one more than by the present efficient Librarian of Congress."

At the last meeting of the Board, the Regents passed the following resolution :

"*Resolved*, That, since the Smithsonian deposit now numbers over 250,000 titles, and is still increasing, at the cost of the Institution, it is, in the opinion of the Regents, desirable that in the new building for the Library of Congress, sufficient provision shall be made for its accommodation and increase in a distinct hall or halls, worthy of the collections, and such as, while recalling to the visitor the name of Smithson, shall provide such facilities for those consulting the volumes as will aid in his large purpose of the diffusion of knowledge among men."

I have brought this resolution of the Regents to the attention of the present Librarian of Congress and to that of the Chief of Engineers, the officer in charge of the new building. I learn from the latter official that, owing to the length of time occupied in the construction, it will probably be from six to eight years before any effect can be given to this resolution ; and, in the mean time, with the overcrowded condition of the present quarters of the Library, the chests sent up from the Institution still often continue to lie unopened, so that their contents are inaccessible.

Owing to this overcrowding and, as it is understood, to insufficient clerical aid in the Capitol Library, this noble collection, the product of thirty years' accumulation from the fund of Smithson, is, if not altogether lost to science and learning, at any rate so impaired in its use-

* See Smithsonian Report of 1867.

fulness that it can not be assumed that any series of learned transactions is now complete or that any student can any longer find what he seeks in what was once provided for his aid. I beg to recommend this regrettable state of things to the notice of the Congressional Regents. The present sad condition must, from the nature of the case, grow yearly still worse under the present arrangement; and it seems certain that, by the time the new building is ready for the books, the entire collection will have its value so impaired as to be pecuniarily and otherwise of little value in comparison with the original cost. The only remedy still applicable would seem to lie in providing temporary quarters for the collection under the care of the Librarian of Congress, but outside of the overcrowded quarters in the Capitol.

The labor of recording and caring for the accessions to the library has been carried on as during the last fiscal year, with this exception, that, the work being now thoroughly organized, it has been practicable to dispense with the services of one of the three clerks previously employed in this department.

The construction of additional cases in the reading-room has given increased facilities for the display of periodicals, and the number of serials now at the disposal of readers has arisen from 265 (as at the time of my last report) to 432. The reading-room is well used by those classes of readers for whom it was designed.

The most important operation in connection with the library during the year has been the commencement of the work of carrying out the plan for increasing the library by systematic exchanges, which was originated soon after I entered on my duties as Assistant Secretary, at the desire of Secretary Baird.

Realizing that there must be many scientific and technical periodicals of value, especially in branches of science not directly related to the work carried on at the Institution, which were not known in our library, and recognizing the fact that many new publications have come into existence since the last systematic attempt to procure full returns for the publications distributed by the Institution, I addressed circulars to three hundred gentlemen in this country who are noted for their eminence in the different branches of knowledge, desiring them to furnish me with lists of the scientific periodicals which were of value to them in their special fields of investigation.*

In reply to these circulars, 174 voluminous lists were received, and these I caused to be carefully collated. The result of this collation is a list of 3,600 titles, embracing, as it is believed, nearly if not quite all periodical literature of importance in the various branches of knowledge, exclusive of belles-lettres and the art of medicine.

In order, however, that this list should be of any practical service to the Institution, it is first necessary to learn which of these publications the Institution may already possess, either in complete or imperfect

* Copies of these circulars are to be found in Appendix 4 to my report for 1887-'88.

files. To ascertain this, each title in the list must be laboriously compared with the records of the library, running back frequently for many years. Again, should a learned society, publishing transactions, or the publishers of a journal mentioned in this list, be found to have received Smithsonian publications without making any adequate return, the records of the distribution of publications must be searched, in order to find the exact amount of publications furnished, that upon this the Institution may base its demand for a return.

It will be seen that the publications in question fall naturally into four classes.

(1) Journals which receive the Smithsonian publications, and which are not to be found in the library of the Institution.

(2) Journals which receive the Smithsonian publications, but which make either no return or an inadequate return for these.

(3) Journals which regularly exchange with the Institution, but of which the files in the library are for any reason defective.

(4) Journals which regularly exchange with the Institution, and of which the library possesses a complete file.

When each of the 3,600 titles has been assigned to its proper place in one of these four classes, a letter must be written to each one of the journals belonging to the first three classes, as follows: To the first class, offering to exchange; to the second, calling attention to the fact that the Institution has received no adequate returns for its favors, and to the third, asking for the volumes or parts of volumes required to complete the files.

It will thus be evident that a work of no small magnitude remained to be performed after the list of journals was prepared. A careful estimate showed that it would require the entire time of a competent clerk for at least twelve months to perform the necessary routine work. As, however, the Institution was not in a position to employ an extra clerk for work which would be so largely for the benefit of the Library of Congress, the matter was allowed to rest here.

The desirability of the plan, however, commended itself so strongly to me that I could not willingly see it given up and the large amount of labor already expended remain unfruitful. Accordingly, towards the latter part of the past fiscal year, I presented the matter to Mr. A. R. Spofford, the Librarian of Congress, who, recognizing the advantages that would accrue to that Library from carrying out the plan, consented to defray the expense of the necessary clerical work from his own appropriations. The work was accordingly begun on June 1, 1889, and will be carried on continuously under the immediate supervision of the librarian, Mr. John Murdoch.

It is estimated that of the 3,600 titles under consideration, at least one-half, or 1,800, will prove to be new and desirable accessions to the library, while the work done in endeavoring to complete broken series must prove to be of great value.

The following is a statement of the books, maps, and charts received by the Smithsonian Institution from July 1, 1888, to June 30, 1889:

Volumes:		
Octavo or smaller.....	1,002	
Quarto or larger.....	498	
		1,500
Parts of volumes:		
Octavo or smaller.....	5,556	
Quarto or larger.....	6,646	
		12,202
Pamphlets:		
Octavo or smaller.....	2,705	
Quarto or larger.....	473	
		3,178
Maps.....		474
Total.....		17,354

Of these accessions 4,810 (namely, 441 volumes, 3,752 parts of volumes, and 617 pamphlets, were retained for use in the Museum library, and 521 medical dissertations were deposited in the library of the Surgeon-General's Office, U. S. Army; the remainder was promptly sent to the Library of Congress on the Monday following their receipt.

The following universities have sent complete sets of all their academic publications for the year, including the inaugural dissertations delivered by the students on graduation: Bern, Bonn, Dorpat, Erlangen, Freiburg-im-Breisgau, Giessen, Göttingen, Halle-an-der-Saale, Heidelberg, Helsingfors, Jena, Kiel, Königsberg, Leipzig, Louvain, Lund, Tübingen, Utrecht, and Würzburg.

A list of the important accessions will be found in the Appendix (Report of the Librarian).

THE DEPARTMENT OF LIVING ANIMALS.

The collection of the department of living animals has increased during the year (almost wholly by donations) to such an extent as to quite overcrowd its accommodations, and render it necessary to resolutely check its growth, while the degree of interest manifested in this small display has been surprising. This has been shown not only by the residents of Washington, and visitors to the city, who form the daily crowd of visitors, but many residents of remote States and Territories have testified their interest by sending valuable gifts to the collection.

Besides these, many valuable gifts of quadrupeds and birds have been received from United States Army officers in Texas. A most valuable donation received during the year came from the Hon. W. F. Cody (Buffalo Bill), of North Platte, Nebr., and consisted of three fine American elks, two males and a female.

Dr. V. T. McGillicuddy, of Rapid City, Dak., offered to deposit in the collection four American bisons which have been in his possession for several years. The conditions of the offer were considered suf-

ficiently liberal to justify its acceptance, and accordingly Mr. George H. Hedley, of Medina, N. Y., was requested to proceed to Rapid City, where he received the animals and arrived in Washington with them in good condition. Being fine specimens they have naturally attracted much attention.

The overcrowded condition of the temporary cages and yards containing the larger animals has caused extreme trouble, not only to provide properly for the shelter and comfort of the specimens, but to keep them from either killing or injuring each other. Only with larger space and better facilities will it be possible to so care for these animals, and many others like them, that they will not only be a stock from which to replenish their races, so rapidly vanishing from the continent, but a source of constant instruction and recreation for the people.

The department of living animals has served an important purpose in aiding to bring about the establishment by Congress of a National Zoological Park, for the public interest manifested in the collection, forcibly emphasized the general desire and need for such an institution founded on a liberal scale. During the period when the Zoological Park proposition was before the Fiftieth Congress, the Secretary considered that the curator of this department, Mr. Hornaday, could not render more important service than by explaining to Members the details of the plan proposed, and he was accordingly directed to devote a portion of his time to that duty.

The actual accommodations provided for the living animals are necessarily of the most temporary character, and do not in the slightest degree indicate the proper construction of permanent improvements of this kind in a first-class zoological garden. At present a large number of living quadrupeds, birds, and reptiles are crowded together in one small and ill-ventilated building heated by steam, which, during exhibition hours, is usually filled with visitors to an uncomfortable extent. It will be a great boon to the public and to the animals composing the collection as well, when the latter can be transferred to the Zoological Park and provided with suitable accommodations. Under the circumstances it is very desirable that this should be accomplished at the earliest date possible.

The total number of living specimens received during the year was 271, of which 126 were gifts, 37 were deposited, and 8 purchased. The final catalogue entry on June 30, 1889, was 341, which represents the total number of specimens received since the collection was begun. In spite of the disadvantages the curator and his two assistants have labored under in the care of this collection, it is gratifying to be able to report that during the year the losses by death have been almost wholly confined to the small and least valuable animals; and, with the exception of an antelope which was presented by Senator Stanford and died before it had time to recover from the effects of its long journey, all the large and most valuable specimens are alive and in good health.

It is well to direct attention to the fact that Congress has as yet made no special appropriation for the care of these animals, which, with their food, represents a considerable sum, ill spared from the limited appropriation at the disposal of the Secretary for the increase and preservation of the collections, on which so many other pressing demands are made.

ZOOLOGICAL PARK.

In my previous report I stated that a bill had been introduced by Senator Beck to create, under the care of the Regents of the Smithsonian Institution, a zoological garden on Rock Creek, where these animals might not only form the subject of study, but be expected to increase as they do not in ordinary captivity; and I gave the amendment to the sundry civil appropriation bill, reported by Senator Morrill, which was substantially the same as the bill of Senator Beck.

For reasons which may be found in my letter to the chairman of the Committee on Public Buildings and Grounds, quoted later, I gave much time and labor in the interests of this measure, at first without success, the House Committee on Appropriations having reported its non-concurrence in the Zoological Park amendment, and, after a long debate, which occupied the attention of the House through a considerable portion of the 12th of September, 1888, the motion to concur was defeated. In the subsequent conference on the sundry civil bill, the Senate conferees agreed that the amendment should be stricken out, so that the bill was lost.

In pursuance of what seemed to me a public duty, I did not accept this defeat of the bill as final, but brought the matter again before the attention of Congress.

On the 18th of January, 1889, at the request of the Hon. S. Dibble, I addressed a letter to him as chairman of the Committee on Public Buildings and Grounds, to which had been referred a bill of the House, introduced by the Hon. W. C. P. Breckinridge, of similar purport to that introduced in the Senate. This letter the committee made the basis of its recommendation for the passage of the bill in the following words:

REPORT to accompany bill H. R. 11810.

The Committee on Public Buildings and Grounds, to which was referred the bill (H. R. 11810) "for the establishment of a Zoological Park in the District of Columbia," having had the same under consideration, respectfully submits the following report:

Appended hereto is a letter of Prof. S. P. Langley, Secretary of the Smithsonian Institution, portraying the necessity of such a park and the advantages to be derived from its establishment; and, for reasons therein set forth, your committee respectfully recommends the passage of the bill.

SMITHSONIAN INSTITUTION,
Washington, D. C., January 18, 1889.

MY DEAR SIR: I write what follows in accordance with the suggestion of your yesterday's letter, intending it for your consideration and that of the committee.

From all parts of the country, for many years, presents of live animals have been made to the Government through the Smithsonian Institution or the Museum; but the absence of any appropriation for their care has led to their being sent away (though most reluctantly) to increase the collections of the zoological parks in Philadelphia, New York, London, and other cities. It should be better known than it is that everywhere through the country there is a disposition on the part of private individuals to give to the Government in this way, and without any expectation of return, remarkable specimens, which the donor (very commonly a poor man) sometimes refuses advantageous pecuniary offers for, and it seems hard to decline gifts made in such a spirit, or, accepting them, to give them away again.

But little over a year ago I gave instructions that these live specimens should be retained temporarily, as an experiment, and although a very few have been purchased, the collection, which is a subject of so much local popular interest, has been thus formed, substantially by gift, within perhaps fifteen months, and this though many proffers have been declined for want of means to care for them. I am persuaded that, if it were generally known that the Government would receive and care for such gifts, within a very few years the finest collection of American animals in the world might be made here in this way, with comparatively no expenditure for purchase.

Among the many interested in the incipient collection was Senator Beck, whose bill for the formation of a zoological park was brought before the Senate on April 23, 1888. The writer directed the Senator's attention to the fact that a piece of ground singularly suitable, by the variety of its features, to the provision for the wants of all the different kinds of animals, existed in the picturesque valley of Rock Creek in the part nearest to the city. Here not only the wild goat, the mountain sheep and their congeners would find the rocky cliffs which are their natural home, but the beavers brooks in which to build their dams; the buffalo places of seclusion in which to breed and replenish their dying race; aquatic birds and beasts their natural home, and in general all animals would be provided for on a site almost incomparably better than any now used for this purpose in any other capital in the world.

With this is the pre-eminently important consideration that the immediate neighborhood to the city would make it accessible not only to the rich, but to the poor, and therefore a place of recreation to the great mass of the residents, as well as to the hundreds of thousands of citizens from all parts of the country who now annually visit the capital.

It may be added that, so far as is known to the writer, all those interested in the desirable but larger plan for a public park along the whole Rock Creek region—that is to say, all those acquainted with the beauties and advantages of the site—regard the establishment of the proposed zoological park there with favor. It is very difficult for any one who has not visited the region to understand its singularly attractive character, due to the good fortune which has preserved its picturesque features intact until now, although the growing city is sweeping around and enveloping it.

The Smithsonian Institution has not customarily received with favor the propositions continually made it to place different local or national interests under its charge, but the very special reasons which seem in this case to enable it to at once secure a home and city of refuge for the vanishing races of the continent, and a place for the health and recreation of the inhabitants of the city, and citizens of the United States, together with an opportunity for the carrying out an enterprise of

national scientific value, and the formation of what, as regards its site, at least, is the finest zoological garden in existence—all these considerations have moved it to see in this an opportunity to carry out its legitimate work, “the increase and diffusion of knowledge among men.”

When, therefore, Senator Beck made the understanding that the Smithsonian Institution would accept the charge of such a park, the primary condition on which he would undertake to recommend it to Congress, the Secretary felt authorized to say that he believed it probable that the proposition would be favorably viewed by the regents, and, the matter once brought before Congress, he has not disguised his own interest in the success of the measure.

The bill, brought in by Mr. Breckinridge in the House (and by Senator Morrill in the Senate), appropriates \$200,000 for the purchase of not less than 100 acres of land. The land actually most desired for the zoological park covers about 120 acres, being precisely that portion of the Rock Creek Valley which will be soonest destroyed, as regards its picturesque and attractive features, by the laying out of streets and lots. Nevertheless, and largely owing to the very fact that the picturesqueness of the locality implies the existence of rocks, precipices, and valleys, which it would cost much to level and fill in, this land can still be obtained at rates which, considering its neighborhood to the city, are remarkably cheap. The most thorough examination that I have been able to make, the testimony of various real-estate experts and others, have satisfied me that the purchase may and will be completed for somewhat less than the sum named in the appropriation, even leaving a small margin for the erection of a preliminary shelter for the animals.

I beg most respectfully to urge upon the attention of the committee the fact that it is at once the strength and weakness of this measure that, so far as is known, it is an entirely disinterested one, the real-estate holders in the vicinity being generally indifferent or opposed to it, for reasons which can be explained, if desired, and that it is being thus pressed upon Congress by those who have the measure at heart, because anything that is done must be done soon. It is probable that within a year or two more, the good fortune which has kept this singularly interesting spot intact, while the growing city is encircling it, will protect it no longer. It is not the mere space on the map which is to be secured, but natural advantages which have no relation to the number of acres, and which can not be restored if once destroyed, since it is not in the power of Congress itself by any expenditure of money to recreate a rock or a tree.

I am, very respectfully, yours,

S. P. LANGLEY,
Secretary.

Hon. SAMUEL DIBBLE,
House of Representatives.

It appears, however, that this recommendation could not be brought to the consideration of Congress in season for action, and at nearly the same time Senator Edmunds introduced an amendment to the District bill. There were at this time two measures being pressed upon the attention of Congress, one for the creation of a national park, including a thousand or more acres upon Rock Creek, extending far beyond the limits of the proposed zoological park, and requiring a large expenditure not for buildings but for lands, a measure with which the

Smithsonian Institution was not concerned; the other a much more limited scheme for the zoological park, which latter it was understood in Congress was to be placed under the Smithsonian Institution.

Under these circumstances the honorable Mr. Edmunds introduced an amendment to the District of Columbia bill, as follows :

AMENDMENT intended to be proposed by Mr. Edmunds to the bill (H. R. 11651) making appropriations to provide for the expenses of the government of the District of Columbia for the fiscal year ending June thirtieth, eighteen hundred and ninety, and for other purposes, viz: Insert the following:

“For the establishment of a zoological park in the District of Columbia, two hundred thousand dollars, to be expended under and in accordance with the provisions following, that is to say:

“That, in order to establish a zoological park in the District of Columbia, for the advancement of science and the instruction and recreation of the people, a commission shall be constituted, composed of three persons, namely: The Secretary of the Interior, the president of the board of Commissioners of the District of Columbia, and the Secretary of the Smithsonian Institution, which shall be known and designated as the commission for the establishment of a zoological park.

“That the said commission is hereby authorized and directed to make an inspection of the country along Rock Creek, between Massachusetts avenue extended and where said creek is crossed by the road leading west from Brightwood crosses said creek, and to select from that district of country such a tract of land, of not less than one hundred acres, which shall include a section of the creek, as said commission shall deem to be suitable and appropriate for a zoological park.

“That the said commission shall cause to be made a careful map of said zoological park, showing the location, quantity, and character of each parcel of private property to be taken for such purpose, with the names of the respective owners inscribed thereon, and the said map shall be filed and recorded in the public records of the District of Columbia; and from and after that date the several tracts and parcels of land embraced in such zoological park shall be held as condemned for public uses, subject to the payment of just compensation, to be determined by the said commission and approved by the President of the United States, provided that such compensation be accepted by the owner or owners of the several parcels of land.

“That if the said commission shall be unable to purchase any portion of the land so selected and condemned within thirty days after such condemnation, by agreement with the respective owners, at the price approved by the President of the United States, it shall, at the expiration of such period of thirty days, make application to the supreme court of the District of Columbia, by petition, at a general or special term, for an assessment of the value of such land, and said petition shall contain a particular description of the property selected and condemned, with the name of the owner or owners thereof, and his, her, or their residences, as far as the same can be ascertained, together with a copy of the recorded map of the park; and the said court is hereby authorized and required, upon such application, without delay, to notify the owners and occupants of the land and to ascertain and assess the value of the land so selected and condemned by appointing three commissioners to appraise the value or values thereof, and to return the appraisement to the court; and when the values of such land are thus ascertained, and the President shall deem the same reasonable, said

values shall be paid to the owner or owners, and the United States shall be deemed to have a valid title to said lands.

“That the said commission is hereby authorized to call upon the Superintendent of the Coast and Geodetic Survey or the Director of the Geological Survey to make such surveys as may be necessary to carry into effect the provisions of this section; and the said officers are hereby authorized and required to make such surveys under the direction of said commission.”

The amendment of Senator Edmunds was understood to be offered in a spirit entirely friendly to the interests of this Institution, but it differs from that reported from the Committee on Public Buildings and Grounds, in omitting the name of the Regents, in placing the appropriation under those for the District, in removing from the Commission the power to lay out the land, and in extending the limits within which they had choice, to the military road, in this, as in other respects, resembling the limits of the larger scheme of the national park, as generally proposed. On the 28th of February the Edmunds amendment passed substantially as above given, and by the President's approval of the District bill, became a law on March 2.*

In view of the fact that the zoological park will probably in any case be the ultimate place of deposit for the living collections now under the charge of the Regents, and that their secretary is named as one of the commissioners for effecting the purchase, it seems proper to add a brief statement of the work done by the commission, which, after personally and carefully inspecting the whole course of the stream from Massachusetts avenue to Military road, about 4 miles above the city, found no district so desirable for the single purpose of a zoological park as that lying between Woodley Lane and Klingle Bridge, and designated in the original bill of Senator Morrill; and the commissioners have proceeded to condemn a tract of 166 acres of the remarkably varied and picturesque country whose character is described in the secretary's letter to the chairman of the Committee on Public Buildings and Grounds already cited.

The condemnation is not complete without the President's approval, which had not been given at the date of the completion of the fiscal

*Extracts from the Congressional Record. Mr. Breckinridge, of Kentucky, states, “I append the report of the Committee on Public Buildings and Grounds that the record may show the exact object in view. There is absolute protection from jobbery in the fact that this is to be under the supervision of the Smithsonian Institution.” Mr. Dibble says in the same debate, “We are proud of the Smithsonian, and the Smithsonian has already, by gift, not purchase, the nucleus of a collection, and I am informed by the Secretary of the Smithsonian that this place furnishes the right kind of location for the propagation and perpetuation of these rapidly disappearing species of American animals, while at the same time it will serve the purposes of a public park.” Mr. Dibble continued, “I am informed that the inquiries, estimates, and offers indicate that the 120 acres which is included in the design now in front of the reporter's desk [referring to a large map showing that part of the creek between Woodley Lane and Klingle road, which the Morrill bill placed under the care of the Regents] can be purchased for something less than \$200,000, etc.”

year, but I may be allowed to so far anticipate a statement properly belonging to a later report as to say that this approval has since been given, and that the land will almost undoubtedly become the property of the Government. The commission has no power to lay out the land, and has no instruction from Congress as to its ultimate destination, owing, it may well be supposed, to the general supposition in the House that the bill as voted contained a clause placing it under the care of the Smithsonian Institution.

MISCELLANEOUS.

The Statue to Professor Baird.—In recognition of the distinguished services of the late Professor Baird, a bill was introduced in the Senate of the United States, and passed by that body February 10, 1888, making an appropriation for the erection of a bronze statue to commemorate his merits. This bill was referred, in the House of Representatives, to the Committee on the Library, but was not reported. It is hoped that this important subject will, during the coming session, receive the attention which it merits. An appropriation of \$25,000 was made by Congress for the benefit of the widow of the late Secretary, whose life had been so unselfishly devoted to the service of the nation.

Art Collections.—I alluded in a previous report to the fact that a very valuable collection of art objects had been promised to the Smithsonian Institution. The intending donor is understood to contemplate the transfer of the collection at no very remote period, the principal condition being that the Institution shall provide a suitable fire-proof building for it.

Upon the representations of the agent of the Institution in Europe, as to the value of the collection and as to the desire of its owner to see your Secretary in order to arrange for the formal transfer, the writer made a brief visit to France last July, for the purpose of such conference and arrangement, but illness on the owner's part has delayed action, so that the Secretary is not able, as he had hoped to be, to lay the matter more fully before the Regents at their present meeting.

Assignment of rooms for scientific work.—During the past year the use of rooms in the Smithsonian building has been continued to the Coast and Geodetic Survey for pendulum experiments, and a room has been assigned to the use of the Zoological Park Commission.

Toner lecture fund.—The Secretary of the Institution is *ex officio* chairman of the board of trustees. The fund, consisting partly of Washington real estate and partly of Government bonds, has an estimated value of about \$3,000. A lecture was delivered on May 29, in the hall of the Museum, by Dr. Harrison Allen, of Philadelphia, on "A Clinical Study of the Skull," the first delivered under this fund for several years.

Grants and subscriptions.—In accordance with the precedents established by your first Secretary for encouraging meritorious scientific enterprises, undertaken without view to pecuniary gain, a subscription of twenty copies of the *Astronomical Journal*, edited by Dr. B. A. Gould, has been continued.

Privilege of the floor of the House of Representatives.—Owing to the lamented death of the Hon. S. S. Cox, no further action appears to have been taken by the House in reference to a bill introduced by him to confer the privilege of the floor on the Secretary of the Smithsonian Institution.

Smithsonian grounds.—At the request of the Director of the Geological Survey, permission was granted to place stones for a base line 300 feet on B street, south, to be used as a standard of comparison for tape lines.

American Historical Association.—Reference was made in the last report to a bill introduced in the Senate to incorporate the Historical Association and to connect it with the Smithsonian Institution. Congress has since passed the act organizing the association.

Stereotyping.—All the stereotype plates belonging to the Institution have been brought from Philadelphia to Washington and stored in the basement of the building.

I have elsewhere alluded to the fact that the practice of stereotyping the bulletins and proceedings of the Washington scientific societies has been discontinued.

Temporary shed.—I have also elsewhere alluded to the purpose of putting up in the Smithsonian grounds a temporary shelter for instruments and apparatus, which may at the same time permit of some astrophysical observations being made. This, however, is only a temporary expedient, and if the Regents ever sanction the erection of an observatory for this purpose it will be necessary to place it in some very quiet locality far removed from all tremor. Such a locality exists in the new zoological park, but while the action of Congress in regard to the purchase of the latter was still uncertain I addressed a letter to the honorable the Secretary of War, asking permission in case it were found desirable to occupy a vacant tract of land in the southern portion of the cemetery at Arlington for this purpose. His assent was given in the following letter:

WAR DEPARTMENT,
Washington City, January 9, 1889.

SIR: I have the honor to acknowledge the receipt of your letter of the 18th ultimo, requesting that the Smithsonian Institution be authorized to occupy a site in the Arlington national cemetery, as indicated in a memorandum and plat inclosed by you, for the purposes of an astro-physical laboratory.

In reply I beg to advise you that there is no objection to the occupation, in the manner stated, of a piece of ground not exceeding 2 acres, indicated on a plat which may be examined in the office of the Quartermaster-General, provided that the ground in question be vacated whenever it is required by this Department.

Very respectfully,

WM. C. ENDICOTT,
Secretary of War.

Prof. S. P. LANGLEY,
Secretary Smithsonian Institution.

The plat in question shows the location of the lot near the center and highest part of the unoccupied wooded ridge, near the colored soldiers' portion of the cemetery. The site, however, is so distant that I should not propose to occupy it while any better could be procured.

Reception.—I have alluded in my previous report to the habit of the first Secretary of giving receptions from time to time in the rooms of the Institution and to the fact that though these rooms are now devoted to official purposes, the writer, desiring to maintain the traditions of this hospitality, had used them once for a similar purpose. He has again employed them in this year on the 18th of April for a reception where it was sought to unite the old and new friends of the Institution.

Correspondence.—The Institution receives annually inquiries from all parts of the country for information on topics often most incongruous, but usually connected with science, which are submitted to the Secretary. None of these inquiries is left unanswered, and the burden of this correspondence is very considerable. It has always been regarded, however, as incumbent on the Institution to reply to them as a part of its function in the distribution of knowledge, and a good deal of labor which does not appear, continues to be devoted to this end.

U. S. NATIONAL MUSEUM.

The main features of the work of the National Museum are briefly referred to in this place. They are fully described elsewhere, in the separate volume forming the report of Dr. Goode, Assistant Secretary in charge of the Museum, and the Curators of its several departments.

Classified service of the Museum.—In response to a resolution of the Senate asking for a "schedule of the classified service of the officers and employés of the National Museum," a letter was addressed by me on March 2 to Hon. John J. Ingalls, President *pro tempore* of the Senate, transmitting a schedule which upon very careful deliberation represents the actual necessities of the service.

This schedule and the letter of transmittal were printed as miscellaneous document No. 92, Fiftieth Congress, second session, and are here re-printed:

LETTER of the Secretary of the Smithsonian Institution in reference to Senate resolution of October 8, 1888, asking for "a schedule of the classified service of the officers and employés of the National Museum."

SMITHSONIAN INSTITUTION,

March 2, 1889.

SIR: In response to the Senate resolution asking for "a schedule of the classified service of the officers and employés of the National Museum," I have the honor to transmit the accompanying schedule, which represents the present actual necessities of the service.

The service for the fiscal year of 1887-'88 was reported upon in a letter to the Speaker of the House of Representatives, dated December 1, 1888 (H. R. Mis. Doc. No. 55, Fiftieth Congress, second session).

In this the aggregate expenditures for service were shown to have been \$122,750.47, of which sum \$97,493.32 was paid from the appropriation for preservation of collections, \$19,203.79 from that for furniture and fixtures, and \$6,053.36 from that for heating, lighting, and electrical and telephonic service.

A schedule of the number of persons employed in the various departments of the Museum was also given in this letter (pages 4, 9, 11). This schedule should, however, be regarded only as an approximate one, since many of the employés were actually engaged only a part of the year, and others were temporarily transferred to the pay-rolls of the Cincinnati Exhibition and were engaged in special work in connection with that exhibition.

It is estimated that the aggregate expenditures for services for the present fiscal year (1888-'89) will be \$129,710, of which amount \$103,000 will be paid from the appropriation for preservation of collections, \$20,000 from that for furniture and fixtures, and \$5,710 from that for heating, lighting, and electrical and telephone service.

In the schedule herewith transmitted it is shown that for the proper working of the Museum the amount required for services would be as follows:

For salaries of scientific assistants.....	\$56,300.00
For clerical forces	36,920.00
For services in preparing, mounting, and installing the collections.....	22,060.00
For services in policing, caring for, and cleaning the buildings	36,740.00
For services in repairing buildings, cases, and objects in the collections..	14,163.50
For salaries and wages in designing, making, and inspecting cases and other appliances for the exhibition and safe-keeping of the collections.	18,337.50
For services in connection with the heating, lighting, and electrical and telephonic service.....	6,620.00
For services of miscellaneous employés, including draughtsmen, messengers, etc.....	7,980.00
Total	199,121.00

The increase in the total expenditure, as indicated, is due partly to the addition of a number of officers to the scientific staff, and also to the necessity for a few additional clerks, and a considerable number of watchmen, laborers, cleaners, and messengers, whose services are essential to the safety of the collections, as well as to provide for the cleanliness and proper care of the buildings and for the comfort of visitors.

The rates of pay indicated are in most cases considerably lower than are customarily allowed for a similar service in the Executive Departments.

In the schedule now presented, expenditure for services only is taken into consideration.

No attempt has been made to present the needs of the Museum in regard to the purchase or collecting of specimens, the purchase of general supplies, preservatives, materials for mounting and installing collections, books, exhibition cases, furniture, fuel, and gas, the maintenance of the heating and lighting appliances, freight and cartage, travelling expenses of collectors and agents, etc.

For these various purposes the expenditure in the last fiscal year amounted to \$45,249.53, and that for the present fiscal year will, it is estimated, amount to about \$48,000, a sum very inadequate to the needs of the service.

It does not include the expenditures for printing the labels and blanks and proceedings and bulletins of the Museum, for which the appropriation for many years past has been \$10,000, and for which I have asked \$15,000 for the coming fiscal year.

I must not omit to call your attention to the fact that, owing to the peculiar constitution of the Museum as a scientific establishment, it has hitherto been possible to secure a special economy, owing to the fact that its officers and employes are not scheduled as in the Executive Departments.

In thus presenting, in obedience to the request of the Senate, a schedule of a durable organization of the service, I wish to remark, emphatically, that there are pressing needs in other directions—needs that merit the serious consideration of Congress, in order that the National Museum may be enabled to maintain a satisfactory position in comparison with those of European nations.

I have the honor to be, your most obedient servant,

S. P. LANGLEY,
Secretary.

Hon. JOHN J. INGALLS,
President, *pro tempore*, of the Senate.

Schedule of the classified service of the officers and employes of the United States National Museum, arranged according to duty and salary, as required for the proper working of the Museum.

Designation.	Compensation.
<i>Scientific staff.</i>	
Secretary Smithsonian Institution, director <i>ex officio</i>	
Assistant secretary Smithsonian Institution, in charge of National Museum	\$4,000.00
Curator and executive officer	3,000.00
Five curators, at \$2,400	12,000.00
Five curators, at \$2,100	10,500.00
Four assistant curators, at \$1,600	6,400.00
Four assistant curators, at \$1,400	5,600.00
Four aids, at \$1,200	4,800.00
Six aids, at \$1,000	6,000.00
Special service by contract	4,000.00
	56,300.00
<i>Clerical staff.</i>	
Chief clerk	2,200.00
Four chiefs of divisions: Correspondence; transportation, storage, and record; publications and labels; installation, at \$2,000	8,000.00
One disbursing clerk*	1,200.00

* This officer receives pay also from the Smithsonian Institution for similar services.

Schedule of the classified service of the officers and employes of the United States National Museum, etc.—Continued.

Designation.	Compensation.
<i>Clerical staff—Continued.</i>	
One clerk of class 4	\$1,800.00
Two clerks of class 3	3,200.00
Three clerks of class 2	4,200.00
Four clerks of class 1	4,800.00
Four copyists, at \$900	3,600.00
Four copyists, at \$720	2,880.00
Six copyists, at \$600	3,600.00
Three copyists, at \$480	1,440.00
	36,920.00
<i>Preparators.</i>	
Photographer	2,000.00
Assistant photographer	1,000.00
Artist	1,320.00
Chief taxidermist	2,000.00
One taxidermist	1,500.00
Two taxidermists, at \$1,000	2,000.00
Two taxidermists, at \$720	1,440.00
One modeller	2,000.00
One modeller	1,200.00
One general preparator	1,200.00
One general preparator	900.00
Special service by contract	5,500.00
	22,060.00
<i>Buildings and labor.</i>	
One superintendent of buildings	1,620.00
Two assistant superintendents, at \$1,000	2,000.00
Four watchmen, at \$780	3,120.00
Twenty-four watchmen and door-keepers, at \$600	14,400.00
Twelve laborers, at \$480	5,760.00
Three attendants, at \$480	1,440.00
Ten attendants and cleaners, at \$360	3,600.00
Special service of laborers and cleaners, to be paid by the hour	4,800.00
	36,740.00
<i>Mechanics (repairing buildings, cases, and objects in the collections).</i>	
Cabinet-maker, at \$3.50 per day	1,095.50
Two painters, at \$2.50 per day	1,565.00
One tinner, at \$2 per day	626.00
One stone-cutter and mason, at \$2 per day	626.00
Six skilled laborers, at \$2.50 per day	4,695.00
Six skilled laborers, at \$2 per day	3,756.00
Special service by contract	1,800.00
	14,163.50
<i>Furniture and fixtures.</i>	
Engineer of property	2,000.00
One copyist	900.00
One copyist	720.00

Schedule of the classified service of the officers and employés of the United States National Museum, etc.—Continued.

Designation.	Compensation.
<i>Furniture and fixtures—Continued.</i>	
One copyist.....	\$600. 00
One copyist.....	480. 00
Six carpenters and cabinet-makers, at \$3 per day.....	5, 634. 00
Three painters, at \$2 per day.....	1, 978. 00
Two skilled laborers, at \$2.50 per day.....	1, 565. 00
Two skilled laborers, at \$2 per day.....	1, 252. 00
Three laborers, at \$1.50 per day.....	1, 408. 50
Special service by contract.....	1, 800. 00
	<hr/>
	18, 337. 50
	<hr/>
<i>Heating, lighting, and electrical service.</i>	
Engineer.....	1, 400. 00
One assistant engineer.....	900. 00
Six firemen, at \$600.....	3, 600. 00
Telephone clerk.....	720. 00
	<hr/>
	6, 620. 00
	<hr/>
<i>Miscellaneous.</i>	
Agent.....	1, 200. 00
One draughtsman.....	1, 200. 00
Two draughtsmen, at \$600.....	1, 200. 00
Two messengers, at \$600.....	1, 200. 00
One messenger.....	540. 00
Two messengers, at \$480.....	960. 00
Two messengers, at \$360.....	720. 00
Four messengers, at \$240.....	960. 00
	<hr/>
	7, 980. 00
	<hr/>

In presenting these schedules to Congress I have shown what would be the cost of the administration of the Museum, in respect to salaries alone, if it were organized after the manner of the Executive Departments of the Government.

The salary list alone amounts to \$199,121, and the amount expended in the previous fiscal year for other purposes was \$45,000, a sum which might most advantageously be doubled.

I am not prepared at present to recommend the adoption of such a schedule of classified service, since I am of the opinion that the Museum at the present time has greater need of money to be used in the acquisition of new material by purchase and exploration. The opportunities for making collections are yearly growing less, and many things which can now be done at trifling expense will in a few years be impracticable.

The system of appropriation for specific objects, without designating the number of employés or the amounts of their salaries, has in the past been found to be economical and efficient, and although the necessity of the change to a classified service may arise at some later time, I trust that it may be deferred for the present.

The amount asked for in the estimates for the fiscal year of 1891-'92, for the "preservation of collections," is intended to provide for a certain amount of increase of the collections, and also to provide for the payment of certain salaries.

Increase of the collections.—At the close of the fiscal year (June 30, 1889) a very careful estimate showed that the collections were sixteen times as great in number of specimens as in the year 1882. I desire to call your attention especially to the statements bearing upon this point.

The Museum, as I have already said, is growing as it is fitting that the National Museum of a great country should grow, and it is not only necessary to care for what is already here, but to provide for the reception and display of the great collections which will unquestionably be received in the immediate future.

The extent and character of the accessions during the year is shown in the appended table, from which it appears that the total number of specimens in the Museum is now not far from 3,000,000:

Statistics of accessions to National Museum Collections, 1882 to 1885.

Name of department.	1882.	1883.	1884.	1885.
Arts and industries:				
Materia medica		4,000	4,442	
Foods		² 1,244	1,580	
Textiles			2,000	
Fisheries			5,000	
Animal products			1,000	
Naval architecture			600	
Historical relics				
Coins, medals, paper money, etc				
Musical instruments				
Modern pottery, porcelain, and bronzes				
Paints and dyes				
"The Catlin Gallery"				
Physical apparatus				
Oils and gums				
Chemical products				
Ethnology			200,000	
American aboriginal pottery			12,000	
Oriental antiquities				
Prehistoric anthropology	35,512	40,491	45,252	
Mammals (skins and alcoholics)	4,660	4,920	5,694	
Birds	44,354	47,246	50,350	
Birds' eggs			40,072	
Reptiles and batrachians			23,495	
Fishes	50,000	65,000	68,000	
Mollusks	³ 33,375		400,000	
Insects	1,000		⁴ 151,000	
Marine invertebrates	³ 11,781	³ 14,825	⁵ 200,000	
Comparative anatomy:				
Osteology	3,535	3,640	4,214	
Anatomy	70	103	3,000	
Palæozoic fossils		20,000	73,000	
Mesozoic fossils			100,000	
Cenozoic fossils		(Included with mollusks.)		
Fossil plants		4,624	⁶ 7,291	
Recent plants				
Minerals		14,550	16,610	
Lithology and physical geology	⁷ 9,075	12,500	18,000	
Metallurgy and economic geology		30,000	40,000	
Living animals				
Total	193,362	263,143	1,472,600	

¹ No census of collection taken.² Including paints, pigments, and oils.³ Catalogue entries.⁴ Professor Riley's collection numbers 15,000 specimens.⁵ Estimated.⁶ Fossil and recent.⁷ In reserve series.

Statistics of accessions to National Museum collections, 1886 to 1880.

Name of department.	1885-'86.	1886-'87.	1887-'88.	1888-'89.
Arts and industries:				
Materia medica	4,850	5,516	5,762	5,942
Foods	¹ 822	² 377	³ 877	911
Textiles	3,063	3,144	³ 3,144	3,222
Fisheries	19,870	10,078	³ 10,078	³ 10,078
Animal products	2,792	2,822	³ 2,822	2,948
Naval architecture				³ 600
Historical relics	1,002	} 13,634	14,640	³ 14,990
Coins, medals, paper money, etc.	1,005			
Musical instruments	400	417	427	³ 427
Modern pottery, porcelain, and bronzes	2,278	2,238	3,011	³ 3,011
Paints and dyes	177	100	³ 100	109
"The Catlin Gallery"	500	500	³ 500	³ 500
Physical apparatus	250	251	³ 251	³ 251
Oils and gums	¹ 197	198	³ 198	213
Chemical products	¹ 659	661	³ 661	688
Ethnology	⁴ 500,000	503,764	505,464	506,324
American aboriginal pottery	25,000	⁴ 26,022	⁴ 27,122	28,222
Oriental antiquities				850
Prehistoric anthropology	65,314	101,659	108,631	116,472
Mammals (skins and alcoholics)	7,451	7,811	8,058	8,275
Birds	55,945	54,987	56,484	57,974
Birds' eggs	44,163	⁴ 48,173	50,055	50,173
Reptiles and batrachians	25,344	27,542	27,664	28,405
Fishes	75,000	100,000	101,350	107,350
Mollusks	⁴ 460,000	425,000	455,000	462,000
Insects	⁴ 500,000	⁴ 585,000	595,000	603,000
Marine invertebrates	⁴ 350,000	⁴ 450,000	515,000	515,300
Comparative anatomy:				
Osteology	} 10,210	⁴ 11,022	11,558	11,753
Anatomy				
Palæozoic fossils	80,482	81,491	84,649	91,126
Mesozoic fossils	69,742	70,775	70,925	71,236
Cenozoic fossils				
Fossil plants	77,429	8,462	10,000	10,178
Recent plants	30,000	⁴ 32,000	⁴ 38,000	33,459
Minerals	18,401	18,601	21,896	27,690
Lithology and physical geology	20,647	⁴ 21,500	22,500	27,000
Metallurgy and economic geology	45,000	⁴ 49,000	51,412	52,076
Living animals			220	491
Total	2,420,944	2,666,335	2,803,459	2,864,244

¹Duplicates not included.²Foods only.³No entries of material received during the year have been made on the catalogue.⁴Estimated.⁵2,235 are nests.⁶Including Cenozoic fossils.⁷Exclusive of Professor Ward's collection.

Catalogue entries.—The number of entries made in the catalogues of the various departments in the Museum during the year has been 23,171.

The registrar states that 16,625 boxes and packages* have been received during the year and entered upon the transportation records of the Smithsonian Institution. Of this number 2,182 contained specimens for the Museum.

PRINCIPAL ACCESSIONS TO THE COLLECTIONS.

Among the collections received during the year, those from the U. S. Geological Survey and the Bureau of Ethnology are especially noteworthy. The material transferred by the U. S. Fish Commission to the National Museum included two very valuable collections made by the steamer *Albatross* during the voyage from Washington to San Francisco and while cruising off the coast of Alaska.

The accessions received during the year from general sources are fully up to the standard of previous years. Among the most important are the following :

Ethnological.—Collections from Dr. James Grant Bey, of Cairo, Egypt, and from Mr. W. W. Rockhill, formerly connected with the German legation in Pekin, the former collection from Egypt, the latter illustrative of the religious practices, occupations, and amusements of various peoples in different parts of China, Thibet, and Turkestan ; a collection of oriental seals from Mrs. Anna Randall Diehl, of New York City ; casts of Assyrian and Egyptian objects obtained by Prof. Paul Haupt, of Johns Hopkins University.

The valuable co-operation of the Bureau of Ethnology is evidenced in the transmission of a large and interesting collection of pottery, stone implements, woven fabrics, shells, beans, etc., collected by Major J. W. Powell, Arthur P. Davis, Gerard Fowke, Dr. E. Boban, Dr. H. C. Yarrow, James Stevenson, Dr. J. S. Taylor, C. C. Jones, James D. Middleton, General G. P. Thruston, James P. Tilton, H. P. Hamilton, Victor Mindeleff, H. W. Henshaw, G. H. Hurlbut, W. W. Adams, De L. W. Gill, William A. Hakes, W. H. Holmes, and Charles L. R. Wheeler. This collection was the result of personal research in the following localities: Mexico, Peru, New Mexico, Wisconsin, California, Arizona, Alabama, Georgia, Pennsylvania, Tennessee, Massachusetts, New York, and Virginia.

Archæological.—Collection of aboriginal pottery from Lake Apopka, Florida, contributed by Dr. Featherstonehaugh, and a collection of similar material from Perdido Bay, Alabama, presented by Mr. F. H. Parsons, of the U. S. Coast and Geodetic Survey ; a large collection of prehistoric weapons and ornaments from graves in Corea, presented by Mr.

*An increase of 4,225 over the number received last year.

P. L. Jouy; a valuable collection of prehistoric antiquities, for the most part from the Ohio River Valley, deposited by Mr. Warren K. Moorehead, of Xenia, Ohio.

Mammals.—A full-grown moose collected and presented by Col. Cecil Clay, of the Department of Justice; a fresh specimen of Sowerby's whale, contributed by Capt. J. L. Gaskell, keeper of the United States Life-Saving Station at Atlantic City; a skin of *Ovis musimon*, a skeleton of *Monachus albiventer*, and several European bats, received from the Royal Zoological Museum at Florence, Italy; three specimens of American elk presented by Hon. W. F. Cody; a Rocky Mountain sheep, contributed by Mr. George Bird Grinnell, of New York.

Birds and Birds' Eggs.—A rare collection of birds from the National Museum at Costa Rica; a valuable collection of skins from the Old World, presented by Dr. C. Hart Merriam, of the Department of Agriculture; a collection of Japanese birds, purchased from Mr. P. L. Jouy, of the National Museum; bones of Pallas cormorant, collected at the Commander Islands, Kamtchatka, by Dr. Leonhard Stejneger, of the National Museum, the only bones of this bird extant; a collection of typical Australian birds in alcohol, from the Australian Museum, Sydney, New South Wales; an interesting collection of birds' eggs and nests, presented by Mr. Dennis Gale, of Gold Hill, Colo.; eggs of *Cardellina rubrifrons*, new to the collection and to science, contributed by Mr. William W. Price, of Tombstone, Ariz.

Fishes.—Collections of fishes from the Gulf of California, transmitted by Messrs. O. P. Jenkins, of De Pauw University, and B. W. Evermann, of the State Normal School at Terre Haute, Ind.; a collection of fishes from New Zealand, sent in exchange from the Otago University Museum, at Dunedin, New Zealand.

Mollusks.—A valuable collection of marine and terrestrial shells presented by Messrs. F. B. and J. D. McGuire, of Washington.

Insects.—A large series of insects purchased from Dr. Taylor Townsend by the Department of Agriculture and transferred to the museum; an extensive series of dried Coleoptera presented by Mr. G. W. J. Angell, of New York.

Marine Invertebrates.—A collection of crustaceans from Japan, obtained by Mr. Romyu Hitchcock, of the National Museum; specimens of marine invertebrates collected by Lieut. J. F. Moser, of the U. S. Coast and Geodetic Survey, at Cape Sable, Florida.

Fossils.—A collection of cretaceous fossils presented by President David S. Jordan, of Indiana State University; a large series of Lower Cambrian fossils from Conception Bay, Newfoundland, including the types of thirteen species, collected and transferred to the Museum by Mr. C. D. Walcott, of the U. S. Geological Survey.

Botany.—Herbarium specimens from Dr. Ferdinand von Müller, of Melbourne, Australia; a series of specimens of algæ from the New England coast, presented by Mr. F. S. Collins, of Malden, Mass.; agatized wood from the Drake Manufacturing Company, Sioux Falls, Dak.; fossil leaves from Constantine von Ettingshausen, of the University of Gratz, Austria-Hungary.

Geology.—Specimens of ancient and modern marbles from Europe and Africa received in exchange from the Museum of Natural History in Paris; a series of metamorphic and eruptive rocks, presented by Prof. O. A. Derby, of the National Museum of Brazil; a collection of minerals consisting of nearly 1,400 specimens, and obtained by Prof. S. L. Penfield, of the U. S. Geological Survey, in St. Lawrence County, N. Y.; a similar collection gathered by Mr. W. F. Hillebrand, of the U. S. Geological Survey, in Colorado, Utah, New Mexico, and Arizona; a series of petroleums and related material collected by Prof. S. F. Peckham, of Providence, R. I., in connection with his work for the Tenth Census.

Miscellaneous.—The following specially important collections have also been added to the collections during the year: A collection of drugs, from Dr. J. W. Jewett, examiner of drugs, custom-house, New York City, and a collection of similar material transmitted by the royal gardens at Kew; a valuable collection of photo-mechanical process work presented by Prof. Charles F. Chandler, of Columbia College, New York; General Washington's toilet-table deposited by Mrs. Thomas C. Cox, of Washington; account-book belonging to General Washington, together with a number of engravings and other personal property of General Washington, deposited by Mr. Lawrence Washington, of Virginia; an interesting collection of coins, including specimens of the "hook money" and other coins of the native princes of India, from Hon. W. T. Rice, United States consul at Horgen, Switzerland; a model of the locomotive "Old Ironsides," built by Matthias Baldwin in 1832, and presented by the Baldwin Locomotive Works; a model of Trevithick's locomotive, built in 1804 by Mr. D. Ballauf, from drawings lent to the Museum; a stereoscope with examples of the daguerreotype process, and the old albumen process on glass received from Mrs. E. J. Stone, of Washington; a valuable series of prints in carbon and other processes presented by Mr. J. W. Osborne, of Washington. Some of

the most valuable collections received during the year were obtained through the co-operation of Government officials, and are referred to at length in the report on the Museum for this year.

Co-operation of Departments and Bureaus of the Government.—The Museum has received, as in past years, many valuable contributions from United State consuls, officers of the Army and the Navy, and through the co-operation of the Departments and Bureaus of the Government.

Through the courtesy of the Department of State the work of collectors in foreign countries has been greatly facilitated. The Secretary of the Treasury has issued several permits for the free entry of Museum material.

The Secretary of Agriculture has expressed his willingness to cooperate with the National Museum in the matter of making a forestry exhibit, and Dr. B. E. Fernow has been appointed honorary curator of the collection.

By direction of the Postmaster-General the Superintendent of the Dead Letter Office has been instructed to inform the Museum of the receipt in his office of specimens which might be of value for addition to the collections.

The Superintendent of the Coast and Geodetic Survey has, as in previous years, aided our work in many ways.

Photographic exhibit.—A collection intended to show the uses of photography was prepared by Mr. T. W. Smillie, of the National Museum, for exhibition at the Cincinnati Exposition. This collection included valuable contributions of photographs from Prof. E. C. Pickering, of Harvard University, Mr. J. W. Osborne, of Washington, and from several officers connected with the Government service, notably the Light-House Board, the Army Medical Museum, and the proving ground at Annapolis. At the close of the Exposition this collection was returned to the Museum, and is now being prepared, in connection with additional material which has since been received, for permanent exhibition. It is intended that the scope of this exhibit shall be enlarged so as to take the form of a historical collection in which shall be shown examples of every photographic process that has been invented, together with the appliances used, beginning with the photograph of the solar spectrum as made by Sheele in 1777. Considerable material has been already gathered which will be incorporated in this collection. The first camera made in the United States has been acquired by purchase. A stereoscope containing daguerreotypes and transparencies by the old albumen process on glass has been presented by Mrs. E. J. Stone. The Scoville Manufacturing Company of New York has presented a series of cameras showing the latest improvements, and from the Eastman Dry Plate Company, of Rochester, N. Y.,

has been received a Kodak camera, together with a series of enlarged photographs illustrating its use.

Distribution of duplicate specimens.—Duplicate specimens, to the number of 11,382, were distributed during the year among museums, colleges, and individuals. The following table shows the character and extent of these distributions :

Nature of specimens distributed.	Number of specimens.
Ethnology.....	268
American prehistoric pottery.....	32
Prehistoric anthropology.....	833
Mammals.....	42
Birds.....	636
Birds' eggs.....	3
Reptiles.....	47
Fishes.....	39
Mollusks.....	369
Insects.....	197
Marine invertebrates.....	2,072
Invertebrate fossils.....	598
Fossil and recent plants.....	2,945
Minerals.....	2,370
Rocks.....	804
Metallurgy.....	58
Photographs and drawings.....	79
Total.....	11,382

The decrease in the number of specimens thus given away, as compared with last year, is accounted for by the fact that only 2,072 specimens of marine invertebrates have been distributed this year, while last year 24,750 specimens of this class were presented to applicants. Eliminating this class of specimens, the number distributed this year is double that of last year. The number of requests for duplicate specimens increase yearly. It is hoped that in the future it may be possible for the Museum to extend its usefulness in this important part of the work. The material now available for distribution is quite inadequate to supply the demand. The curators of mineralogy and of geology obtained a large quantity of material during the past summer for this special purpose. As soon as it has been classified and arranged into sets, an endeavor will be made to fill the many applications for mineralogical and lithological material now awaiting action. The matter of making up sets of duplicate bird-skins is now receiving careful attention, there being much of such material available for distribution.

Labels.—During the year, 3,991 labels were printed, chiefly for use in the departments of metallurgy, materia medica, and birds.

Accessions to the library.—The number of publications added to the library during the year is 6,052, of which 648 are volumes of more than 100 pages, 903 are pamphlets, 4,343 are parts of regular serials, and 158 charts. The most important accession was the gift by the heirs of the late Dr. Isaac Lea, consisting of 137 volumes, 276 “parts,” and 693 pamphlets, and including a nearly complete series of the “Proceedings of the Zoological Society of London.” There are now nineteen sectional libraries attached to the several curatorships in the Museum.

Publications of the Museum.—The issue of Museum publications during the year has been unusually small, owing to the pressure of Congressional work at the Printing Office during the long Congressional session of 1888, which caused the Museum work to be set aside. A number of special publications are partially completed, and will be issued soon after the beginning of the next fiscal year.

During the year volume 10 of Proceedings of the U. S. National Museum (1887) was issued. This contains viii + 771 pages and 39 plates. It includes 78 papers by 26 authors, 10 of whom are officers of the Museum. Nearly three-fourths of the papers relate to birds and fishes. In the appendix is printed a catalogue of the exhibit prepared by Mr. S. R. Koehler, in charge of the section of graphic arts, for the Ohio Valley Centennial Exposition. Special papers were prepared by the curators of several departments, in connection with the exhibits for this exposition, which will be reprinted in Section III of the Museum report for the present year.

Bulletin 33 of the United States National Museum, “A catalogue of minerals and their synonyms alphabetically arranged for the use of museums” by Prof. T. Egleston, Ph. D., of Columbia College, was issued in May. This volume contains a complete catalogue of the names of minerals and their synonyms, and will be of much value to students of mineralogy and others interested in this science.

The assistant secretary in charge of the Museum has submitted a statement reviewing the history of the publications of the Museum, and making certain suggestions with a view to increasing the extent of the editions and to the establishment of a systematic method of distribution. From this statement I quote the following remarks and recommendations relating to the Proceedings and Bulletin :

“The Proceedings was established for the purpose of securing prompt publication of the discoveries in the Museum. In order to secure this object the printing has been done, signature by signature, as fast as matter was prepared. A certain number of signatures has always been distributed, as soon as published, to scientific institutions and specialists. The number of sets of signatures thus distributed has been in the neighborhood of 200.

“This method of publication has seemed to be to some extent wasteful, and it is thought that equally good results may be secured by distributing a certain number of the advance copies in the form of authors' extras. In making arrangements for the printing of Volume XII it

was decided that out of the edition of 1,200 copies, 100 should be delivered in signatures as fast as printed, and 300 in extras or reprints, in paper covers, of which 50 are to be given to the authors and the remainder distributed to specialists in the various departments to which the papers relate, who are not otherwise provided with the publication; while the 800 remaining volumes are to be bound previous to distribution.

"In special instances, where a given paper in the Proceedings is believed to possess great general interest, it has been customary to print a considerable number of extra copies.

"The publication of the Proceedings and the Bulletin was at first paid for from the printing fund of the Interior Department, with which the Museum was at that time in close relations in respect to financial matters. Subsequently it was paid for from the fund for the printing of Museum labels, estimates for which were annually submitted by the Secretary of the Institution. The amount asked for was usually \$10,000. In the Book of Estimates the Museum appeared as asking a certain sum for printing, though the money was actually included in the gross sum allotted to the Interior Department as a printing fund.

"In 1882, a separate appropriation was made for the first time, in these words: 'For the National Museum, for printing labels and blanks and for the Bulletins and annual volumes of the Proceedings of the Museum, ten thousand dollars.'

"In 1888 the appropriation for the fiscal year 1888-9 was made in the same words, but was not included, as heretofore, in the appropriations for the Department of the Interior.

"The edition of the earlier volumes of the Proceedings and Bulletins was usually only 1,000, of which a portion was distributed by the Department of the Interior and a portion by the Museum. The number received by the Museum being sometimes 500 and sometimes as few as 250. The edition placed at the disposal of the Museum being so small, and withal so uncertain as to extent, the distribution was always of necessity informal, and no effort was made to supply a regular list of institutions and specialists. A considerable number was expended in the work of the Museum, and the remainder were sent to correspondents of the Museum in exchange for publications, for specimens, and incidentally to such institutions as might apply for copies, as well as to individuals, especially students who made it evident that they were in a position to make good use of the books.

"Formal publication was undertaken by the Smithsonian Institution, it being the intention that the first cost of composition and electrotyping having been provided for by the special Congressional appropriation, the Smithsonian Institution should avail itself of the electrotype plates and use them in making up certain volumes of the Miscellaneous Collections. The papers published in the Proceedings and Bulletins of the Museum were of precisely the same character which, since 1862, had made up the great majority of the most important papers in the Miscellaneous Collections. The Institution undertook to print an edition of 1,200 copies in the form of volumes of the Miscellaneous Collections and to distribute them to the principal libraries of the world. This was, at the time, regarded as advantageous, since the cost of composition and electrotyping made up at least two-thirds of the cost of the edition of 1,200, while the miscellaneous distribution, for which the Institution, in the case of similar publications printed at its own expense, had been accustomed to provide, was now already arranged for out of the preliminary issue of several hundred copies paid for from the Museum fund.

“The first four volumes of the Proceedings and the first sixteen numbers of the Bulletin were published in this manner.

“Since 1883 no *publication* of the Bulletins has been made, and none has been made in the case of the Proceedings since 1882.

“There remain *unpublished* eleven volumes of the Proceedings and twenty-one numbers of the Bulletin—in all, enough to make ten thick volumes of the Miscellaneous Collections. Possibly, by condensation and omissions, the number might be reduced to nine volumes. If the Institution were to undertake to print the edition of 1,000 now customary in the case of the Miscellaneous Collections, the cost would be not less than \$9,000. The same amount expended by the Institution in printing fresh matter would probably not produce more than one and one half volumes, or at most two volumes, of Miscellaneous Collections.

“The Institution is possibly under obligations to provide for the publication of these papers, since in the advertisement to each volume of the Bulletin as late as 1887 (Bulletin 33) appears the statement that ‘from time to time the publications of the Museum which have been issued separately are combined together and issued as volumes of the Miscellaneous Collections.’

“As a matter of fact, however, the publication of an edition of 1,000 copies by the Smithsonian Institution would not really meet the necessities of the case, since it would leave unsupplied a very large number of libraries quite as deserving as those already on the distribution list.”

It seems, in view of all these facts, that it is not desirable that the Institution should undertake hereafter the publication of the Museum Bulletin and Proceedings, since it is evident that these will increase in bulk from year to year, and that the demand upon the Institution would very soon become too burdensome. Dr. Goode suggests that Congress be requested to increase the appropriation for the Museum printing to \$18,000 in order that an edition of 2,000 copies may be printed in addition to the customary number. If this arrangement should be carried out, the Smithsonian Institution would be relieved of the responsibility of providing for the publication of these documents. The issue of the enlarged edition would commence with volume 13 of the Proceedings and with Bulletin 40 or 41. In considering the question of publishing back volumes of the Proceedings and Bulletin, Dr. Goode remarks:

“When we come to the question of the *publication* of the back volumes, volumes 1 to 4 of the Proceedings and Bulletins 1 to 16 may be regarded as *published*, although not to the extent to which it would seem desirable in the way of supplying local institutions. Of the following, we have in hand enough to make a very fair distribution, viz: Proceedings, volumes 10 and 11 and Bulletins No. 33 to 37. Of volumes 5 to 9 of Proceedings and of Bulletins 17 to 32, however, no systematic publication can be made without the printing of an additional number of copies.”

Students.—In accordance with the policy of past years, free access to the collections has been granted to students in the various branches of

natural history, and in many instances specimens have been lent to specialists for comparison and study. Instruction in taxidermy has been given to several applicants. Two of these intend to apply the knowledge thus acquired in making collections for the Museum, namely, Lieut. E. H. Taunt, United States consular agent to the Congo, and Mr. Harry Perry, who expects to spend several years in Honduras. Mr. T. W. Smillie has given instruction in photography to the following persons: Lieut. E. H. Taunt, Mr. W. H. Perry, Mr. Barton Bean, Mr. Howard, Prof. Daish, and Miss Frances B. Johnston.

Special researches.—The special researches of the curators are referred to at length in the report of the National Museum. I may say, in this connection, that the time which those officers are able to devote to work of this kind is very limited, owing to the large amount of mechanical and routine work to which, in the absence of necessary assistance, it is necessary for them to give their personal attention.

Meetings and lectures.—The use of the lecture hall has been granted for lectures and meetings of scientific societies, as follows: The National Dental Association met on July 24, 25, and 26. On the evening of September 20 was held one of the meetings of the Medical Congress. The American Ornithologists' Union held its sixth congress on November 13, 14, and 15. A meeting of the Department of Superintendence of the National Educational Association was held on March 6, 7, and 8. The National Academy of Sciences held its meetings on April 16, 17, and 18. The Council of the American Geological Society and the American Committee of the International Geological Congress held business meetings on April 19. The American Historical Association held its fifth meeting in Washington during Christmas week; the evening sessions being held at the Columbia University, the morning sessions at the Museum.

In the Toner course Dr. Harrison Allen delivered a lecture on May 29 entitled "Clinical Study of the Skull undertaken in connection with the Morbid Condition of the Jaws and Nasal Chambers."

The usual course of Saturday lectures, ten in number, beginning March 9 and ending May 11, was delivered under the direction of the joint committee of the scientific societies of Washington.

The usual courtesies have been extended to museums and other public institutions by the gift and loan of drawings and photographs of specimens and copies of Museum labels.

Visitors.—The number of visitors to the Museum building is constantly increasing. The register shows that a total number of 374,843 persons visited the Museum during the year. This exceeds the number for last year by 125,818, and shows an increase of more than 50 per cent. The visitors to the Smithsonian building numbered 149,618, an increase of 46,177 over last year. On March 2, owing to the crowds of visitors to

the city attending the Inauguration ceremonies, no less than 19,968 persons visited the Smithsonian and Museum buildings.

Personnel.—During the year a department of forestry has been established, and with the consent of the Secretary of Agriculture, Dr. B. E. Fernow, chief of the forestry division of the Department of Agriculture, has been appointed its curator.

Dr. George Vasey, of the Department of Agriculture, has been appointed curator of botany, and in that capacity controls the botanical collections in the National Museum and in the Department of Agriculture. Prof. Paul Haupt, curator of Oriental antiquities in the National Museum, was designated as the representative of the Smithsonian Institution at the Eighth International Congress of Orientalists, to meet in Stockholm and Christiania in September. Prof. Otis T. Mason was instructed to proceed to Europe to visit the principal ethnological museums of France, Germany, Denmark, and England, for the purpose of making arrangements for the increase of the collections at the U. S. National Museum, and incidentally, through the study of methods of installation, of providing for the more effectual preservation and utilization of these collections. Mr. Thomas Wilson was directed to proceed to Europe to visit the principal museums of France, England, and Dublin for the purpose of studying the methods of installation employed by the European museums.

On August 13, Mr. Silas Stearns, of Pensacola, Fla., who for many years has been a correspondent of the Smithsonian Institution, and has made important collections of fishes in the Gulf of Mexico, died at Asheville, N. C.

Explorations.—During the summer of 1888, Mr. George P. Merrill, curator of geology, made a collecting trip to North Carolina, Pennsylvania, New York, Vermont, New Hampshire, Massachusetts, and Maine. Large collections of rocks were obtained for the Museum. Mr. Thomas Wilson, curator of prehistoric anthropology, visited mounds in Ohio, and made interesting collections. Ensign W. L. Howard, U. S. Navy, who, acting under orders from the Navy Department, sailed for Kotzebue Sound in May last, is making collections in Alaska for the National Museum. Prof. O. P. Jenkins, of De Pauw University, Indiana, is visiting the Hawaiian Islands for the purpose of collecting fishes. A series of his specimens has been promised for the National Museum. In August Dr. W. F. Hillebrand, of the U. S. Geological Survey, visited some of the Western States and Territories partly with a view to making collections of minerals. These will eventually be incorporated with the Museum collections.

Centennial Exposition of the Ohio Valley and Central States.—The act of Congress directing the Executive Departments of the Government, the Department of Agriculture, and the Smithsonian Institution (includ-

ing the National Museum and the U. S. Commission of Fish and Fisheries) to participate in the Centennial Exposition of the Ohio Valley and Central States, to be held in Cincinnati from July 4 to October 27, 1888, passed both houses of Congress and received the approval of the President on May 28. In addition to this, a joint resolution was adopted in which the true intent of the act was declared, with a view to correcting certain misapprehensions which had arisen in regard to the objects for which the money appropriated by Congress in connection with this exhibition could be legally expended. This joint resolution was approved by the President on July 16. A copy of the act and of the joint resolution will be found in the report of the assistant secretary for 1889, wherein is also published a full account of the exhibit prepared under the direction of the Smithsonian Institution in accordance with the terms of the act referred to. Of the \$50,000 appropriated for the Smithsonian Institution \$10,000 was set apart for the U. S. Fish Commission. About 42,000 square feet of exhibition space were reserved for the Government exhibits, 12,000 square feet being devoted to that of the Smithsonian Institution. The assistant secretary was on May 29 appointed representative of the Smithsonian Institution, and active operations for the preparation of a creditable display were immediately commenced. It was unfortunate that only a little more than a month intervened between the passage of the act and the opening of the exhibition. The Smithsonian Institution has, however, had a varied experience in preparing exhibits at a short notice. The first car-load of exhibits left for Cincinnati on June 22, and the last of the twelve car-loads which were sent was shipped on July 12. The following departments of the National Museum were represented at the exhibition, the number of square feet assigned to each being also given :

Department.	Square feet.
Prehistoric anthropology	600
Ethnology	1,120
Biblical archæology	230
Transportation and engineering	600
Naval architecture	312½
Graphic arts	1,500
Photography	925
Mammals (systematic exhibit)	953
" (extermination series)	884
Birds	325
Insects	238
Mollusks	250
Marine invertebrates	125
Botany	90
Mineralogy	60
• Total	8,262½

In addition to this a special exhibit was prepared by the Bureau of Ethnology, Maj. J. W. Powell, Director, to which 1,425 square feet were assigned. The total number of visitors to the exhibition was 1,055,276.

Dr. Goode was unable, on account of other duties, to personally attend the exhibition, and Mr. R. E. Earll was placed in charge of the exhibit.

Considerable difficulty was experienced in connection with the expenditure of the funds appropriated by Congress for the work of preparing exhibits, owing to the decisions of the special auditor appointed to audit the exposition accounts. His objections were in every instance finally withdrawn, and all vouchers have now, after protracted delays, been approved by that official. An extraordinary number of points of a trivial nature were raised, which necessitated the writing of as numerous letters to answer questions which had not previously been understood to come within the province of an auditor. In view of this experience it is urged that should Congress at any time direct the Smithsonian Institution to participate in future expositions, the law be so framed as to require the appointment of an auditing officer who is familiar with the demands of exhibition work. If, however, this be impracticable, it seems proper that the responsibility of selecting and deciding as to what should be the character of the exhibits should be left entirely to the judgment of the various Departments, the auditor's work being limited to the examination of the accounts, which should of course be sufficiently detailed to prevent errors. Another cause of delay in settling the exhibition accounts was due to the fact that the disbursing officer was stationed at Newport, Ky., instead of Washington, where by far the greater part of the bills were contracted. The paymaster drew checks upon the Cincinnati depository only, and this method appeared to be unjust, since it obliged employes to wait several days before receiving payment, and in addition to lose some part of their money, owing to the refusal of the Treasury Department in Washington to honor the checks. The only alternative for them was to present the checks to local banks, paying the usual discount rates.

Marietta Centennial Exposition.—By an Executive order, dated July 11, 1888, permission was granted to the heads of the departments represented at the Cincinnati Exhibition to send to the Centennial Exposition at Marietta, Ohio, such objects as could be conveniently spared either from the exhibits at Cincinnati or direct from Washington. In accordance with this order an exhibit was prepared under the direction of the assistant secretary. Mr. W. V. Cox, chief clerk of the Museum, was appointed by him as his representative. Since only one day intervened in this instance between the issuing of the Executive order and the opening of the exhibition there was no time to be lost. An exhibit, with a total weight of 7,327 pounds, was prepared and installed at Marietta before the opening of the exhibition. The exhibit included specimens selected from the Haida collection of ethnological objects, lithographs of the game fishes of the United States, a series of medals,

photographs of public buildings in Washington, a collection of autotypes, and a series of specimens illustrating the composition of the human body. In addition to these a collection of models, engravings, and paintings illustrative of the methods of transportation adopted by the early settlers in America was selected by Mr. J. E. Watkins from the exhibit of the department of transportation at the Cincinnati Exhibition and forwarded to Marietta.

The organization of the Government Board which was charged with preparations for the Philadelphia Exhibition was so far superior to that of those more recently formed, that it would seem desirable that the plan in favor at that time should be followed as far as possible should similar work be decided upon in connection with future exhibitions.

I regret the growing tendency to withdraw for special expositions a considerable portion of some of the most valuable parts of the collection. The Museum is now approaching a final arrangement in classification, and the objections to this are therefore much stronger now than some years ago when the condition of the collections was more unsettled. The preparation for an exposition seriously impairs the work of the Museum, while considerable damage invariably results to the collections, and often in such a degree that it requires much time and expense to restore them. The managers of local expositions are no longer satisfied to accept the specimens which can be most conveniently spared, but are always anxious to have the most valuable and costly objects. Temporary exposition buildings are never made fire-proof, and the time is sure to come, if the present practice prevails, when some exhibition building containing Government collections to the value of hundreds of thousands of dollars will be destroyed. The experience of the Mexican Government in its participation at the New Orleans Exposition, and of the Government of New South Wales in 1883, may be cited as warnings. If, however, Congress should order in future our participation in expositions, I would especially urge that provision for the work be made at least six months before the date of opening. In each instance in the past the notice has always been extremely short, usually only a few weeks, and in one or two cases less than a week.

I am also disposed to lay stress upon the necessity of liberal appropriations, which should be made with the understanding that new material may be obtained, which shall not only replace that which has been lost in past exhibitions, but shall enrich the Museum collections for home use and for use in future exhibition work. If this necessity is not recognized, the result will be that in a few years the Museum will be greatly impoverished, not only by the destruction of material, but also by the dissipation of the energy of its staff, which, being applied to temporary purposes in this way, is taken away from its legitimate work. It would indeed seem only fair that a distraction of this kind, which affects in large degree every officer and employé, should be com-

compensated for by the opportunity to purchase new material which will remain permanently the property of the Government and increase the usefulness of the governmental Museum work.

BUREAU OF ETHNOLOGY.

Ethnologic researches among the North American Indians were continued, under the Secretary of the Smithsonian Institution, in compliance with acts of Congress, during the year 1888-'89. Maj. J. W. Powell, as director of the work, has furnished the following account of operations:

A report upon the work of the year is most conveniently given under two general heads, viz., field work and office work.

FIELD WORK.

The field work of the year is divided into (1) mound explorations and (2) general field studies, the latter being directed chiefly to archæology, linguistics, and pictography.

Mound explorations.—The work of exploring the mounds of the eastern United States was, as in former years, under the superintendence of Prof. Cyrus Thomas. The efforts of the division were chiefly confined to the examination of material already collected, and to the arrangement and preparation for publication of the data in hand. Field work received much less attention, therefore, than in previous years, and was mainly directed to such investigations as were necessary to elucidate doubtful points, and to the examination and surveys of important works which had not before received adequate attention.

The only assistants whose engagements embraced the entire year were Mr. James D. Middleton and Mr. Henry L. Reynolds. Mr. Gerard Fowke, one of the regular assistants, closed his connection with the division at the end of the second month. Mr. John W. Emmert was engaged as a temporary assistant for a few months.

During the short time he remained with the division, Mr. Fowke was engaged in exploring certain mounds in the Scioto Valley, Ohio, a field to which Messrs. Squier and Davis had devoted much attention. The re-examination of this field was for the purpose of investigating certain typical mounds which had not been thoroughly examined by those explorers.

Mr. Middleton was employed from July to the latter part of October in the exploration of mounds and other ancient works in Calhoun County, Ill., a territory to which special interest attaches because it seems to be on the border line of different archæologic districts. From October until some time in December he was engaged at Washington in preparing plats of Ohio earth-works. During the next month he made re-surveys of some of the more important inclosures in Ohio, after which he continued work in the office at Washington until the latter

part of March, when he was sent to Tennessee to examine certain mound groups, and to determine, so far as possible, the exact locations of the old Cherokee "Over-hill towns." The result of this last-mentioned investigation was one of the most valuable of the year, as it indicated that each of these "Over-hill towns" was, with possibly one unimportant exception, in the locality of a mound group.

Near the close of October Mr. Reynolds, having already examined the inclosures of the northern, eastern, and western sections of the mound region, was sent to Ohio and West Virginia to study the different types found there, with reference to the chapters he is preparing on the various forms of inclosures of the United States. While thus engaged he explored a large mound connected with one of the typical works in Paint Creek Valley, obtaining unexpected and important results. The construction of this tumulus was found to be quite different from most of those of the same section examined by Messrs. Squier and Davis.

Mr. Emmert devoted the few months he was employed to the successful exploration of mounds in eastern Tennessee. Some important discoveries were made, and additional interesting facts were ascertained in regard to the customs of the mound builders of that section.

General field studies.—Early in the month of July Col. Garrick Malery proceeded to Maine, Nova Scotia, and New Brunswick, to continue investigation into the pictographs of the Abnaki and Micmac Indians, which had been commenced in 1888. He first visited rocks on the main-land, near Machiasport, and on Hog Island, in Holmes Bay, a part of Machias Bay. In both localities pecked petroglyphs were found, accurate copies of which were taken. Some of them had not before been reported. They were probably of Abnaki origin, either of the Penobscot or the Passamaquoddy divisions, the rocks lying on the line of water communication between those divisions. From there he proceeded to Kejemkoojik Lake, on the border of Queen's and Annapolis counties, Nova Scotia, and resumed the work of drawing and tracing the large number of petroglyphs found during the previous summer. Perfect copies were obtained of so many of them as are amply sufficient for study and comparison. These petroglyphs were etched and were made by Micmacs. The country of the Malecites, on the St. John's River, New Brunswick, was next visited. No petroglyphs were discovered, but a considerable amount of information upon the old system of pictographs on birch bark and its use was obtained. Illustrative specimens were secured, together with myths and legends assisting in the elucidation of some of the pictographs which had been obtained elsewhere.

Dr. W. J. Hoffman proceeded in July to visit the Red Lake and White Earth Indian reservations in Minnesota. At Red Lake he obtained copies of birch-bark records pertaining to the Midewiwin or Grand Medi-

eine Society of the Ojibwa, an order of shamans or priests professing the power of prophesy, the cure of disease, and the ability to confer success in the chase. The introductory portion of the ritual of this society pertains particularly to the Ojibwa ideas of creation. At the same place several mnemonic charts were secured, consisting of birch-bark records of hunting expeditions, battles with neighboring tribes of Indians, maps, and songs. He also investigates the former and present practice of tattooing, and the Ojibwa works of art in colors, beads, and quills.

At White Earth Reservation two distinct charts of the Grand Medicine Society were obtained, together with full explanations by two of the chief midé or shamans, one of whom was the only fourth degree priest in either of the reservations. Although a considerable amount of difference between these three charts is apparent, the principles are common to them all as well as the general course of the initiation of candidates. An interesting fact appears in the survival of archaic forms in the charts and ritual, seemingly indicating a considerable antiquity. A large number of mnemonic songs was also obtained at this reservation. In addition to much of the ritual, secured directly from the priests, in the original language, translations of the songs were also recorded in musical notation. After the completion of his labors at the above reservations, Dr. Hoffman proceeded to Pipestone, Minn., to secure copies of pictographs reported to occur upon the cliffs of that well known locality. The reports of the great number of petroglyphs were found to have been greatly exaggerated, though a number of what appeared to be personal names were found on the rocks. He then returned to St. Paul, Minn., to search the records of the library of the Minnesota Historical Society for copies of pictographs reported to have been made near La Pointe, Wis. Little information was gathered, although it is well known that such records existed upon conspicuous cliffs and rocks near Lake Superior at and in the vicinity of Bayfield and Ashland.

Dr. Hoffman afterwards made a personal examination of the "pictured cave" 8 miles northeast of La Crosse, Wis., to obtain copies of the various characters occurring there. These are rapidly being destroyed by the disintegration of the rock. The colors employed in delineating the various figures consisted of dark red and black. The figures represented deer, human beings, and various animals and forms not now distinguishable.

Mr. H. W. Henshaw spent the months of August, September, and October on the Pacific coast, engaged in the collection of vocabularies of certain Indian languages, with a view to their study and classification. The Umatilla Reservation in Oregon was first visited with the object of obtaining a comprehensive vocabulary of the Cayuse. Though there are about four hundred of these Indians on the reservation probably not more than six speak the Cayuse tongue. The Cayuse have extensively intermarried with the Umatilla, and now speak the language of the latter, or that of the Nez Percé. An excellent Cayuse vocabulary

was obtained, and at the same time the opportunity was embraced to secure vocabularies of the Umatilla and the Nez Percé languages. His next objective point was the neighborhood of the San Rafael Mission, Marin County, Cal., the hope being entertained that here would be found some of the Indians formerly gathered at the mission. He learned that there were no Indians at or near San Rafael, but subsequently found some half dozen on the shores of Tomales Bay, to the north. From one of these a good vocabulary was collected, and, as was expected, was subsequently found to be related to the Moquelumnan family of the interior, to the southeast of San Francisco Bay. Later the missions of Santa Cruz and Monterey were visited. At these points there still remain a few old Indians who retain a certain command of their own language, though Spanish forms their ordinary means of intercourse. The vocabularies obtained are sufficient to prove, beyond any reasonable doubt, that there were two linguistic families instead of one, as had been formerly supposed, in the country above referred to. A still more important discovery was made by Mr. Henshaw at Monterey, where an old woman was found who succeeded in calling to mind more than one hundred words and short phrases of the Esselen language, formerly spoken near Monterey, but less than forty words of which had been previously known. Near the town of Cayucas, to the south, an aged, blind Indian was visited who was able to add somewhat to the stock of Esselen words obtained at Monterey, and to give besides valuable information concerning the original home of this tribe. As a result of the study of this material, Mr. Henshaw determines the Esselen to be a distinct linguistic family, a conclusion first drawn by Mr. Curtin, from a study of the vocabularies collected by Galiano and Lamaron in the 18th century. The territory occupied by the tribe and linguistic family lies coastwise, south of Monterey Bay, as far as the Santa Lucia Mountain.

On July 5 Mr. James Mooney started on a second trip to the Cherokee Nation in North Carolina, returning November 14, after an absence of about four months. During this time he made considerable additions to the linguistic material already obtained by him, and was able to demonstrate the former existence of a fourth, and perhaps even of a fifth, well-marked Cherokee dialect in addition to the upper, lower, and middle dialects already known. The invention of a Cherokee syllabary, which was adapted to the sounds of the upper dialect, has tended to make that the universal dialect. A number of myths were collected, together with a large amount of miscellaneous material relating to the Cherokee tribe, and the great tribal game of ball play, with its attendant ceremonies of dancing, conjuring, scratching the bodies of the players, and going to water, was witnessed. A camera was utilized to secure characteristic pictures of the players. Special attention was given to the subject of Indian medicine, theoretic, ceremonial, and therapeutic. The most noted doctors of the tribe were employed as informants, and

nearly five hundred specimens of medicinal and food plants were collected and their Indian names and uses ascertained. The general result of this investigation shows that the medical and botanical knowledge of the Indians has been greatly overrated. A study was made of Cherokee personal names, about five hundred of which were translated, being all the names of Indian origin now existing. The most important results of Mr. Mooney's investigation were the discovery of a large number of manuscripts containing the sacred formulæ of the tribe, written in Cherokee characters by the shamans for their own secret use, and jealously guarded from the knowledge of all but the initiated. The existence of such manuscripts had been discovered during a previous visit in 1887, and a number had been procured. This discovery of genuine aboriginal material, written in an Indian language by shamans for their own use, is believed to be unique in the history of aboriginal investigation, and was only made possible through the invention of the Cherokee syllabary by Sequoia in 1821. Every effort was made by Mr. Mooney to obtain all the manuscripts possible, with the result of securing nearly all such material in the possession of the tribe. The whole number of formulæ obtained is about six hundred. They consist of prayers and sacred songs, explanations of ceremonies, directions for medical treatment, and underlying theories. They relate to medicine, love, war, hunting, fishing, self-protection, witchcraft, agriculture, the ball play, etc., thus forming a complete exposition of an aboriginal religion as set forth by its priests in the language of the tribe.

Early in October Mr. Jeremiah Curtin left Washington for the Pacific Coast. During the remainder of the year he was occupied in Shasta and Humboldt Counties, Cal., in collecting vocabularies and data connected with the Indian system of medicine. This work was continued in different parts of Humboldt and Siskiyou Counties until June 30, 1889. Large collections of linguistic and other data were gathered and myths were secured, which show that the whole system of medicine of these Indians and the ministration of remedies originated in and is limited to sorcery practices.

The field of work of Mr. Albert S. Gatschet during the year was of limited duration. It had been ascertained that Mrs. Alice M. Oliver, now in Lynn, Mass., formerly lived on Trespalacios Bay, Texas, near the homes of the Karaukawa, and Mr. Gatschet visited Lynn with a view of securing as complete a vocabulary as possible of their extinct language. Mrs. Oliver was able to recall about one hundred and sixty terms of the language, together with some phrases and sentences. She also furnished many valuable details regarding the ethnography of the tribe. Ten days were spent in this work.

Mr. J. N. B. Hewitt was occupied in field work from August 1 to November 8, as follows: From the 1st of August to September 20 he was on the Tuscarora Reserve, in Niagara County, in which locality fifty-five legends and myths were collectkd. A Penobscot vocabulary was

also obtained here, together with other linguistic material. From September 20 to November 8 Mr. Hewitt visited the Grand River Reserve, where a large amount of text was obtained, together with notes and other linguistic material.

Dr. Franz Boas was employed from February to April in preparing for convenient use a series of vocabularies of the several Salish divisions, previously collected by him in British Columbia.

Mr. Victor Mindeleff left Washington on October 23 for St. John's, Ariz., where he examined the Hubbell collection of ancient pottery and secured a series of photographs and colored drawings of the more important specimens. Thence he went to Zuñi and obtained drawings of interior details of dwellings and other data necessary for the completion of his studies of the architecture of this pueblo. He returned to Washington December 7.

Mr. A. M. Stephen continued work among the Tusayan pueblos under the direction of Mr. Victor Mindeleff. He added much to our knowledge of the traditionary history of Tusayan, and has made an extensive study of the house-lore and records of house-building ceremonials. He furnished also a full nomenclature of Tusayan architectural terms as applied to the various details of terraced house construction, with etymologies. He secured from the Navajo much useful information of the ceremonial connected with the construction of their conical lodges, or "hogans," supplementing the more purely architectural records of their construction previously collected by Mr. Mindeleff. As opportunity occurred he gathered small, typical collections of baskets and other textile fabrics illustrative of the successive stages of their manufacture, including specimens of raw materials and detailed descriptions of the dyes used. These collections are intended to include also the principal patterns in use at the present time, with the native explanations of their significance.

OFFICE WORK.

Director Powell has devoted much time during the year to the final preparation of the paper to accompany the map of the linguistic families of North America north of Mexico, the scope of which has been alluded to in previous years. The report and map are now practically completed, and will appear in the Seventh Annual Report of the Bureau, soon to go to press.

Mr. Henshaw was chiefly occupied with the administrative duties of the office, which have been placed in his charge by the Director, and with the completion of the linguistic map, which is now ready for the engraver.

Col. Garrick Mallery, after his return from the field work elsewhere mentioned, was engaged in the elaboration of the new information obtained and in further continued study of, and correspondence relating to, sign language and pictography.

Dr. W. J. Hoffman continued the arrangement and classification of material embracing the subjects of pictography and gesture language of the North American Indians, but more particularly of the date and sketches secured by him during previous field seasons.

While Mr. J. Owen Dorsey did no field work during the year, he devoted much of the time to original investigations. Samuel Fremont, an Omaha Indian, came to Washington in October, 1888, and until February, 1889, assisted Mr. Dorsey in the revision of the entries for the Čegiha-English Dictionary. A similar work was undertaken by Little Standing Buffalo, a Ponca Indian from the Indian Territory, in April and May, 1889. The summary of Mr. Dorsey's office work is as follows: He completed the entries for the Čegiha-English Dictionary, and a list of Ponca, Omaha, and Winnebago personal names was made. He translated from the Teton dialect of the Dakota all the material of the Bushotter collection in the Bureau of Ethnology, and prepared therefrom a paper on Teton folk-lore. He also prepared a brief paper on the camping circles of Siouan tribes, and in addition furnished an article on the modes of predication in the Athapascan dialects of Oregon and in several dialects of the Siouan family. He also edited the manuscript of the Dakota grammar, texts, and ethnography, written by the late Rev. Dr. S. R. Riggs. This will soon be published as Part I, Volume VII, Contributions to North American Ethnology. In May, 1889, he began an extensive paper on Indian personal names, based on material obtained by himself in the field, to contain names of the following tribes: Omaha and Ponca, Kansa, Osage, Kwapa, Iowa, Oto and Missouri, and Winnebago.

Mr. Albert S. Gatschet's office work was almost entirely restricted to the composition and completion of his Grammar of the Klamath Language of Oregon, with the necessary appendices. The grammar and dictionary are now printed and will soon be published. The ethnography will follow.

During the year Mr. Jeremiah Curtin arranged and copied myths of various Indian families, and also transcribed Wasco, Sahaptin, and Yana vocabularies previously collected.

On his return from the Cherokee reservation in 1888, Mr. James Mooney began at once to translate a number of the prayers and sacred songs obtained from the shamans during his visit. The result of this work will appear in a paper in the seventh annual report of the bureau entitled "Sacred formulas of the Cherokee." Considerable time was devoted also to the elaboration of the botanic and linguistic notes obtained in the field. In the spring of 1889 he began the collection of material for a monograph on the aborigines of the Middle Atlantic slope, with special reference to the Powhatan tribes of Virginia. As a preliminary, about one thousand circulars, requesting information in regard to local names, antiquities, and surviving Indians, were distributed throughout Maryland, Delaware, Virginia, and northeastern Car-

olina. The information thus obtained affords an excellent basis for future work in this direction.

From July 1 to August 1, Mr. J. N. B. Hewitt was engaged in arranging alphabetically the recorded words of the Tuscarora-English dictionary mentioned in former reports, and in the study of adjective word-forms to determine the variety and kind of the Tuscarora moods and tenses. After his return from the field, Mr. Hewitt recorded and tabulated all the forms of the personal pronouns employed in the Tuscarora language. Studies were also prosecuted to develop the predicative function in the Tuscarora speech. All the terms of consanguinity and affinity as now used among the Tuscarora were recorded and tabulated. Literal translations of many myths collected in the fields were made, and free translations added to four of them. In all of these studies linguistic notes were made relating to etymology, phonesis, and verbal change.

Mr. James C. Pilling has, as usual, given all the time he could spare from his executive duties to the preparation of bibliographies of North American languages. The Bibliography of the Iroquoian Languages was completed early in the fiscal year and the edition was issued in February last. In the mean time a Bibliography of the Muskogean Languages has been compiled, the manuscript of which was sent to the printer January 8, 1889, the first proof received February 9, and proof-reading completed early in June. The edition, however, was not delivered during the fiscal year. Early in March, 1889, Mr. Pilling made a trip to Philadelphia to inspect the linguistic material, particularly the manuscripts, belonging to the American Philosophical Society. The library authorities gave him every facility, and much new material was secured. In June Mr. Pilling made a somewhat extended trip through New England States and into Canada, visiting the Astor, Lenox, and the Historical Society libraries in New York; the libraries of the Athenaeum, Public, Massachusetts Historical Society, and the American Board of Commissioners for Foreign Missions, in Boston; that of Harvard University, in Cambridge; the American Antiquarian Society, in Worcester, and the private library of Dr. J. Hammond Trumbull, in Hartford. In Canada he visited the library of Laval University, and the private library of Mr. P. Gagnon, in Quebec, of St. Mary's College and Jacques Cartier School, in Montreal, and various missions along the St. Lawrence River, with a view of inspecting the manuscripts left by the early missionaries. In addition to these he visited many smaller institutions, private libraries, and publishing houses, and the result of the whole trip was the accumulation of much new material for insertion in the Algonquian bibliography. It is thought that the manuscript for this publication will be in shape to send to the printer before the close of the year 1889.

Mr. W. H. Holmes has continued to edit the illustrations for the Bureau publications, and has besides engaged actively in his studies of

aboriginal archæology. He has completed papers upon the pottery of the Potomac Valley and upon the objects of shell collected by the Bureau during the last eight years, and he has others in preparation. As curator of Bureau collections he makes the following statement of accessions for the year: From Dr. Cyrus Thomas and his immediate assistants working in the mound region of the Mississippi Valley and contiguous portions of the Atlantic slope, the Bureau has received one hundred and forty-six specimens, including articles of clay, stone, shell, and bone. Mr. Victor Mindeleff obtained sixteen specimens of pottery from the Pueblo country. Other collections by members of the Bureau and of the Geological Survey are as follows: Shell beads and pendants (modern) from San Buenaventura, Cal., by H. W. Henshaw. Fragments of pottery and other articles from the vicinity of the Cherokee agency, N. C., by James Mooney. A large grooved hammer from the bluff at Three Forks, Mont., by Dr. A. C. Peale. A large series of rude stone implements from the District of Columbia, by DeLancey W. Gill. Donations have been received as follows: An important series of earthen vases from a mound on Perdido Bay, Ala., by F. H. Parsons. Ancient pueblo vases from southwestern Colorado, by William M. Davidson. A series of spurious earthen vessels, manufactured by unknown persons in eastern Iowa, by C. C. Jones, of Augusta, Ga. Fragments of pottery, etc., from Romney, W. Va., by G. H. Johnson. Fragments of a steatite pot from Ledyard, Conn., by G. L. Fancher. A series of stone tools, earthen vessels, etc., from a mound on Lake Apopka, Fla., by Thomas Featherstonhaugh. Fragments of gilded earthenware and photographs of antiquities from Mexico, by F. Plancarte. Fragments of gold ornaments from Costa Rica, by Anastasio Alfaro. Loans of important specimens have been received as follows: Articles of clay from a mound on Perdido Bay, Ala., by Mrs. A. T. Mosman. Articles of clay from the last mentioned locality, by A. B. Simons. Pottery from the Potomac Valley, by W. Hallett Phillips, by S. V. Proudfit, and by H. L. Reynolds. Articles of gold and gold-copper alloy from Costa Rica, by Anastasio Alfaro, secretary of the National Museum at San José.

Prof. Cyrus Thomas was chiefly occupied during the year in the preparation of the second and third volumes of his reports upon the mounds. It is probable that these will be finished during the present fiscal year. He also prepared a bulletin on the Circular, Square, and Octagonal Earth-works of Ohio, with a view of giving a summary of a recent survey by the mound division of the principal works of the above character in southern Ohio. A second bulletin was completed, entitled "The Problem of the Ohio Mounds," in which he presented evidence to show that the ancient works of the State are due to Indians of several different tribes, and that some, at least, of the typical works were built by the ancestors of the modern Cherokee.

Since his return from the field, Mr. H. L. Reynolds has been engaged

in the preparation of a general map of the United States, showing the area of the mounds and the relative frequency of their occurrence. He has since assisted Professor Thomas in the preparation of the monograph upon the inclosures.

Mr. Victor Mindeleff, assisted by Mr. Cosmos Mindeleff, has been engaged in preparing for publication a "Study of Pueblo Architecture" as illustrated in the provinces of Tusayan and Cibola, material for which he has been engaged in collecting for a number of years. This report is now completed, and will appear in the Seventh Annual Report of the Bureau.

At the beginning of the fiscal year Mr. Cosmos Mindeleff and the force of the modelling room completed the bureau exhibit for the Cincinnati Exposition, and during the early part of the year Mr. Mindeleff was at Cincinnati in charge of the same. Owing to restricted space the exhibit was limited to the Pueblo culture group, but this was illustrated as fully as the time would permit. The exhibit covered about 1,200 feet of floor space as well as a large amount of wall space, and consisted of models of pueblo and cliff ruins; models of inhabited pueblos, ancient and modern pottery, examples of weaving, basketry, etc., a representative series of implements of war, the chase, agriculture, and the household, manikins illustrating costumes, and a series of large photographs illustrative of aboriginal architecture of the pueblo region, and of many phases of pueblo life. Upon Mr. Mindeleff's return from Cincinnati he resumed assistance to Mr. Victor Mindeleff upon a report on pueblo architecture, and the close of the fiscal year saw the two chapters which had been assigned him completed. They consist of a review of the literature on the pueblo region and a summary of the traditions of the Tusayan group from material collected by Mr. A. M. Stephen. Work was also continued on the duplicate series of models, and twelve were advanced to various stages of completion. Some time was devoted to repairing original models which had been exhibited at Cincinnati and other expositions, and also to experiments in casting in paper, in order to find a suitable paper for use in large models. The experiments were successful.

Mr. J. K. Hillers has continued the collection of photographs of prominent Indians, in both full-face and profile, by which method all the facial characteristics are exhibited to the best advantage. In nearly every instance a record has been preserved of the sitter's status in the tribe, the age, biographic notes of interest, and in case of mixed bloods the degree of intermixture of blood. The total number of photographs obtained during the year is 27, distributed among the following tribes, viz: Sac and Fox, 5; Dakota, 6; Omaha, 6, and mixed-bloods (Creeks), 10.

LIST OF PUBLICATIONS OF THE BUREAU OF ETHNOLOGY.

ANNUAL REPORTS.

- First Annual Report of the Bureau of Ethnology, 1879-'80. 1881. xxxv, + 603 pp. 8vo.
- Second Annual Report of the Bureau of Ethnology, 1880-'81. 1883. xxxvii, + 477 pp. 8vo.
- Third Annual Report of the Bureau of Ethnology, 1881-'82. 1884. lxxiv, + 606 pp. 8vo.
- Fourth Annual Report of the Bureau of Ethnology, 1882-'83. 1886. lxxiii, + 532 pp. 8vo.
- Fifth Annual Report of the Bureau of Ethnology, 1883-'84. 1887. liii, + 564 pp. 8vo.
- Sixth Annual Report of the Bureau of Ethnology, 1884-'85. 1888. lvii, + 675 pp. 8vo.

CONTRIBUTIONS.

- Contributions to North American Ethnology, Vol. I. 1877. xiv, + 361 pp. 4to.
- Contributions to North American Ethnology, Vol. III. 1877. 3. 635 pp. 4to.
- Contributions to North American Ethnology, Vol. IV. 1881. xiv, + 281 pp. 4to.
- Contributions to North American Ethnology, Vol. V. 1882. 112. 32. xxxvii, + 237 pp. 4to.

INTRODUCTIONS.

- Powell, J. W. Introduction to the Study of Indian Languages. 1877. 104 pp. 4to.
- Powell, J. W. Introduction to the Study of Indian Languages. 2nd ed. 1880. xi, + 228 pp. 4to.
- Mallery, Garrick. Introduction to the Study of Sign Language. 1880. iv, + 72 pp. 4to.
- Yarrow, H. C. Introduction to the Study of Mortuary Customs. 1880. ix, + 114 pp. 4to.
- Mallery, Garrick. Collection of Gesture Signs and Signals. 1880. 329 pp. 4to.
- Pilling, J. C. Proof-sheets of Bibliography of North American Indian Languages. 1885. xl, + 1135 pp. 4to.

BULLETIN.

- Pilling, J. C. Bibliography of the Eskimo Language. 1887. v, + 116 pp. 8vo.
- Henshaw, H. W. Perforated Stones from California. 1887. 34 pp. 8vo.
- Holmes, W. H. The use of Gold and other Metals among the Ancient Inhabitants of Chiriqui, Isthmus of Darien. 1887. 27 pp. 8vo.
- Thomas, C. Work in Mound Exploration of the Bureau of Ethnology. 1887. 15 pp. 8vo.
- Pilling, J. C. Bibliography of the Siouan Languages. 1887. v, + 87 pp. 8vo.
- Pilling, J. C. Bibliography of the Iroquoian Languages. 1888. vi, + 208 pp. 8vo.
- Pilling, J. C. Bibliography of the Muskogean Languages. 1889. v, + 114 pp. 8vo.
- Thomas, C. The Circular, Square, and Octagonal Earth-works of Ohio. 1889. 35 pp. 8vo.
- Thomas, C. The Problem of the Ohio Mounds. 1889. 54 pp. 8vo.
- Holmes, W. H. Textile Fabrics of Ancient Peru. 1889. pp. 17. 8vo.

NECROLOGY.

JEROME H. KIDDER.

Dr. Jerome H. Kidder was born in Baltimore County, Md., on the 26th of October, 1842, and graduated in 1862 at Harvard, where he is still remembered as foremost in the gymnasium as well as on his class-rolls. He immediately then tendered his services for the war, and was placed in charge of the sea island plantations near Beaufort, S. C., where he contracted yellow fever, and was invalided home early in 1863; but upon recovery enlisted in the Tenth Maryland Infantry, in which he served as private and non-commissioned officer until the following year, when he was selected to be medical cadet, and in that capacity was employed in the military hospitals near the capital. During this time he was prosecuting the study of medicine, and in 1866 received from the University of Maryland the degree of M. D. In the same year he was commissioned an assistant surgeon in the U. S. Navy, becoming full surgeon in 1876.

Dr. Kidder's first duty was at Japan, where he quickly acquired the language of the country, and in other ways established the reputation which attached to him throughout his career for his "capacity for taking pains." While on this foreign service he was decorated by the King of Portugal in recognition of services to a distressed vessel of His Majesty's navy.

Dr. Kidder took part in observing the transit of Venus at Kerguelen Island, in 1874, as surgeon and naturalist of the expedition, and the excellent results of his scientific labors and researches therewith will be found described in the Bulletins of the U. S. National Museum. After the return of this expedition, Dr. Kidder arranged his specimens and collections in the Smithsonian Institution, and commenced those kindly and intimate relations with it which continued through his after life, with the regard of all his associates there.

In 1878 Surgeon Kidder married, at Constantinople, Annie Mary, daughter of the Hon. Horace Maynard, minister of the United States to Turkey, and in 1884, having inherited an adequate fortune, he resigned his commission and established his home in Washington, and here organized the bacteriological laboratory in connection with the Navy Museum of Hygiene, and also made a sanitary survey of the site proposed for the new Naval Observatory, while later he was appointed chemist of the U. S. Fish Commission, and in that capacity became one of the most trusted advisers of Professor Baird. His laboratory was in the Smithsonian building, and under the direction of the Secretary of the Institution he made, at the request of Congress, an exhaustive study of the ventilation of the Capitol and of the air in the Senate chambers and the hall of the House, and submitted an extended report or the use of the committees engaged upon the sanitary reform of the

building. In 1887, after the death of Commissioner Baird, he served for a time as Assistant Commissioner of Fisheries, under Commissioner Goode. While connected with the Fish Commission he carried on a successful series of experiments to solve the problems relative to the temperature of living fishes, which have been made public through the reports of the Fish Commission. Besides the reports just referred to, Dr. Kidder contributed valuable papers to various professional and educational publications, and held for years a place on the literary staff of the New York World, and maintained membership in many learned societies. He was one of the founders of the Cosmos Club, and among the organizers of the Harvard Club in Washington, and a prominent member in the Masonic fraternity.

In 1888 Dr. Kidder accepted from the present Secretary the appointment of curator of laboratory and exchanges. His pleasant past relations to the Institution, and the esteem in which he was held by those connected with it, made the closer connection thus established agreeable to all; and the writer can not speak in too warm terms of the character of Dr. Kidder as shown in their business relations. His liberal education and views, served by the "capacity for taking pains" already referred to, were all under the control of the most conscientious regard for duty, and made him a valued administrator of the department under his charge. He knew how to maintain, together with exact order, the kindest relations with all employed in it, who, it is safe to say, remember him with an affection and regard due to his excellent personal qualities, an affection and regard which the writer profoundly shares. Just in his best work, in his fullest physical vigor, Dr. Kidder was stricken with pneumonia, and died after a brief illness on the 8th of April, 1889.

His attachment to this Institution, which had always been of the peculiarly intimate character, was also shown in a bequest of which I shall elsewhere have to speak.

In conclusion, I can not but add to the statement of this great deprivation to the Institution an expression of my sense of personal loss in the parting with a friend who, in every relation of life, was a man as honorable and worthy of trust as any I have ever known.

JAMES STEVENSON.

In recording the death of Mr. James Stevenson, which occurred on the 25th of last July, I have to announce the loss of one of the most valuable as well as one of the oldest and most active collaborators of this Institution.

Mr. Stevenson was born in Maysville, Ky., in 1840, and while still little more than a boy, in the spring of 1857, ascended the Missouri River with the Warren Expedition; and from that time, with the exception of the interval caused by his acceptable services in the civil war,

he annually and regularly visited the Rocky Mountain region, first under the auspices of the United States Exploring Expeditions of Warren and Reynolds, and latterly under that of the U. S. Geological Survey, of which he became the executive officer when that organization first took form, a position in which he remained up to the time of his death. His capacity and integrity were valued not only by the officials of the Survey, which he did so much in connection with, but by those of this Institution, for which during thirty years he gathered in remote regions specimens of natural history, geology, and ethnology, which are permanent testimonials of his enterprise and his industry.

During the season of 1885 he was engaged in making an extended search among the pueblos in the Moquis and Navajo districts of New Mexico, and in this elevated country he was stricken by the dreaded disease which lurks there. I met him in this region in 1887, when he was already aroused, though too late, to a sense of his danger, and am glad to recollect the circumstances of an acquaintance that associated him with the regions of the West, in which so much of his life had been passed, where so much valuable work was done, and where I had an opportunity to learn something of his fertility of resource in emergency and in the intimacy of camp life, of the amiable traits of his private character.

Mr. Stevenson's work was a double one, for he was equally at home in cities, and especially in Washington, where he was extensively known among members of Congress, and where the general confidence reposed in him by them was a deserved tribute not merely to his skill but to his personal integrity.

Respectfully submitted.

S. P. LANGLEY,
Secretary of the Smithsonian Institution.

APPENDIX TO SECRETARY'S REPORT.

APPENDIX I.

PUBLICATIONS OF THE YEAR.

SMITHSONIAN CONTRIBUTIONS TO KNOWLEDGE.

A memoir presented by Prof. Alpheus Hyatt, of Massachusetts Institute of Technology on the "Genesis of the Arietidæ," and recommended by Messrs. Alexander Agassiz, Charles A. White, and William H. Dall, was accepted for publication in the series of Contributions to Knowledge, in February last (1889). In order that the printing of the memoir might be under the convenient revision of the author, the work was placed in the hands of John Wilson & Son, of Cambridge, Mass. The printing of the treatise is well advanced, and it will probably be completed and distributed during the present year. It will form a volume of about 230 quarto pages, illustrated by 35 figures and 14 plates.

Two other publications of the year in the quarto size should be mentioned here, although not intended to be included in the collected volumes of the Contributions. No. 671 of the Smithsonian list is "Natural History Illustrations prepared under the direction of Louis Agassiz, 1849. The Anatomy of *Astrangia Danae*. Six lithographs from drawings by A. Sonrel. Explanation of the plates by J. Walter Fewkes." This issue represents merely a fragment of a memoir undertaken forty years ago by the eminent naturalist, Louis Agassiz, on material collected by him during his first dredging excursion in one of the steamers of the U. S. Coast Survey. This memoir, postponed by other occupations, was never completed, and even the original notes are no longer to be found. But the excellence of the drawings made under his direction from living specimens seems to warrant their publication, even at this late day. The text descriptive of the six plates, by Mr. Fewkes, occupies 20 quarto pages.

672. "Natural History Illustrations prepared under the direction of Louis Agassiz and Spencer F. Baird, 1849. Six lithographs from drawings by A. Sonrel. Explanation of the plates by David Starr Jordan." This, like the preceding, represents merely a fragment of a memoir projected by the joint labors of the two distinguished ichthyologists, and in like manner laid aside under the pressure of more immediate duties. The text explanatory of the six plates is comprised in 12 quarto pages. Were these two brochures more recent and more extended they would well deserve a place in the Smithsonian Contributions to Knowledge.

SMITHSONIAN MISCELLANEOUS COLLECTIONS.

Taking the various publications for the past year belonging to this series in the order in which they stand in the Smithsonian list, the first is:

No. 663. "Index to the Literature of Columbiæ, from 1801 to 1887." By Frank W. Traphagen. This is one of the special bibliographies of chemical literature published by the Institution on the recommendation of the committee appointed by the

American Association for the Advancement of Science, for the purpose of promoting such indexes. The present number forms an octavo pamphlet of 30 pages.

664. "Bibliography of Astronomy for the year 1887." By William C. Winlock. This is in continuation of the series of such bibliographies heretofore appended to the Regents' annual reports. It forms an octavo pamphlet of 63 pages.

665. "Bibliography of Chemistry for the year 1887." By H. Carrington Bolton. This is a similar continuation: an octavo pamphlet of 13 pages.

666. "Additions and Corrections to the List of Foreign Correspondents, to July 1888." By George H. Boehmer. Octavo pamphlet of 36 pages.

667. "Systematic Arrangement of the List of Foreign Correspondents to July, 1888." By George H. Boehmer. Octavo pamphlet of 55 pages.

675. "Report on Astronomical Observatories for 1886." By George H. Boehmer. (From the Smithsonian Report for 1886.) Octavo pamphlet of 119 pages.

683. "Report on Smithsonian Exchanges for the year ending June 30, 1886." By George H. Boehmer. (From the Smithsonian Report for 1886.) Octavo pamphlet of 30 pages.

684. "Miscellaneous Papers relating to Anthropology." (From the Smithsonian Report for 1886.) This collection comprises the following articles: "The Ray Collection from the Hupa Reservation." By Otis T. Mason. Thirty-five pages, with 26 plates. "A Navajo Artist and his Notions of Mechanical Drawing." By R. W. Shufeldt. Five pages with 3 plates. "Notes on the customs of the Dakotahs." By Paul Beckwith. Thirteen pages. "The Atnatanas, Natives of Copper River, Alaska." By Henry T. Allen. Nine pages. "Indians of the Quinaialet Agency, Washington Territory." By C. Willoughby. Sixteen pages with 7 figures. "The Stone Age of Oregon." By Myron Eells. Thirteen pages. "Charm Stones: Notes on the so-called 'plummets,' or sinkers." By Lorenzo G. Yates. Ten pages with 4 plates. "Studies on the Archaeology of Michoacan, Mexico." By Nicholas Leon. Twelve pages with 1 plate. "On some Spurious Mexican Antiquities, and their relation to Ancient Art." By William H. Holmes. Sixteen pages with 18 figures. "Earth-works at Fort Ancient, Ohio." By William M. Thompson. Three pages with 1 figure. Forming in all an octavo pamphlet of 132 pages, illustrated by 26 figures and 34 plates.

685. "On certain Parasites, Commensals, and Domiciliars, in the Pearl Oysters, *Meleagrina*." By Robert E. C. Stearns. (From the Smithsonian Report for 1886.) Octavo pamphlet of 6 pages with 3 plates.

686. "Time reckoning for the Twentieth Century." By Sandford Fleming. (From the Smithsonian Report for 1886.) Octavo pamphlet of 22 pages with 5 figures.

687. "Catalogue of Publications of the Smithsonian Institution; with a classified list of separate publications, and an alphabetical index of authors and subjects." By William J. Rhees. This work embraces all the articles published by the Smithsonian Institution from its organization, in 1846, to the 1st of July, 1886 (a period of forty years), and forms an octavo volume of 383 pages.

688. "Report upon International Exchanges, under the direction of the Smithsonian Institution, for the year ending June 30, 1888." By J. H. Kidder, curator. (From the Smithsonian Report for 1888.) Octavo pamphlet of 16 pages.

SMITHSONIAN ANNUAL REPORTS.

668. Report of Samuel P. Langley, Secretary of the Smithsonian Institution, for the year ending June 30, 1888. An octavo pamphlet of 126 pages.

676. Annual Report of the Board of Regents of the Smithsonian Institution, showing the operations, expenditures, and condition of the Institution for the year ending June 30, 1886. Part I. This part, the report of the Institution proper, contains the Journal of Proceedings of the Board of Regents at the annual meeting held January 13, 1886, the Report of the Executive Committee of the Board of Regents, the report of Professor Baird, the Secretary of the Institution, with subsidiary report on

the exchanges for the year, and a list of additions to the number of foreign correspondents; followed by the usual "General Appendix," in which are given various anthropological papers, by Otis T. Mason, R. W. Shufeldt, Paul Beckwith, Henry T. Allen, C. Willoughby, Myron Eells, L. G. Yates, Nicholas Leon, William H. Holmes, and W. M. Thompson; also papers by Robert E. C. Stearns, Sanford Fleming, List of Astronomical Observatories, by George H. Boehmer, and Catalogue of Smithsonian Publications, by William J. Rhees—forming an octavo volume of xviii + 878 pages, illustrated by 31 figures in the text and 37 plates.

677. Annual Report of the Board of Regents of the Smithsonian Institution for the year ending June 30, 1886, Part II. This part relates to the U. S. National Museum (under the direction of the Smithsonian Institution), showing its progress and condition and containing: (1) Report of the Assistant Secretary of the Smithsonian Institution, G. Brown Goode, upon the condition and progress of the Museum for the year; (2) reports of the curators of the various departments of the Museum; (3) reports upon special collections in the Museum, and papers illustrative of the collections: the meteorite collection, by F. W. Clarke; the gem collection, by George F. Kuntz; the collection of building and ornamental stones, by George P. Merrill; the collection of textiles, fibers, and fabrics, by Romyn Hitchcock; preparation of microscopical mounts of vegetable textile fibers, by the same; and how to collect mammal skins for purposes of study and mounting, by William T. Hornaday; (4) Bibliography of the National Museum; and (5) list of accessions to the collections; followed by a general index. The whole forms an octavo volume of xi + 842 pages, illustrated by 23 figures and 20 plates.

PUBLICATIONS OF THE NATIONAL MUSEUM.

669. Proceedings of the U. S. National Museum, Vol. x, for 1887. This volume contains descriptive papers by Tarleton H. Bean, Charles W. Beckham, C. E. Bendire, Charles H. Bollmann, Ellsworth R. Call, E. D. Cope, Carl H. Eigenmann, Charles H. Gilbert, Theodore Gill, O. P. Hay, Elizabeth G. Hughes, David S. Jordan, F. H. Knowlton, S. R. Koelher, George N. Lawrence, Leo Lesquereux, W. Lilljeborg, Edwin Linton, Frederick A. Lucas, Jerome McNeill, Richard Rathbun, Robert Ridgway, R. W. Shufeldt, John B. Smith, Leonhard Stejneger, Charles H. Townsend, Frederick W. True, George Vasey, and José C. Zeledon. With a general index, this forms an octavo volume of viii + 771 pages, illustrated by 39 plates.

674. Bulletin of the U. S. National Museum, No. 33. Catalogue of Minerals and their Synonyms, alphabetically arranged for the use of museums. By T. Egleston. Octavo, 198 pages.

PUBLICATIONS OF THE BUREAU OF ETHNOLOGY.

670. Fifth Annual Report of the Bureau of Ethnology to the Secretary of the Smithsonian Institution. By J. W. Powell, Director. This contains the introductory report of the Director, 37 pages, with accompanying papers, as follows: Burial mounds of the northern sections of the United States, by Cyrus Thomas; the Cherokee Nation of Indians, by Charles C. Royce; the mountain chant, a Navajo ceremony, by Washington Matthews; the Seminole Indians of Florida, by Clay MacCauley; the religious life of the Zuñi child, by Mrs. Tilly E. Stevenson. The work forms a royal octavo volume of liii + 564 pages, including a general index, and is illustrated 77 figures in the text and 23 plates, 8 of which are chromo-lithographs.

APPENDIX II.

REPORT OF THE CURATOR OF INTERNATIONAL EXCHANGES FOR THE YEAR ENDING JUNE 30, 1889.

WASHINGTON, D. C., November 20, 1889.

SIR: I have the honor to submit the following report of the operations of the exchange bureau for the fiscal year ending June 30, 1889. During the greater part of this time the bureau was under the charge of the late Dr. Jerome H. Kidder, whose able administration has contributed largely to its present efficiency. At the date of his death, April 6, 1889, Mr. Boehmer, upon whom the care of the office immediately devolved, reported that the exchange department, for the first time in its history, had disposed of all packages received, and was prepared to close its book accounts.

In continuation of the statistics usually presented, the following table exhibits in detail the exchange transactions for each month of the fiscal year:

Transactions of the exchange office of the Smithsonian Institution during the fiscal year 1888-'89.

	1888, July.	Aug.	Sept.	Oct.	Nov.	Dec.	1889. Jan.
Number of packages received	3, 305	2, 754	12, 215	5, 448	2, 733	12, 616	2, 180
Weight of packages received (lbs.)	16, 262	6, 835	24, 337	19, 162	9, 248	19, 190	6, 196
Entries made:							
Foreign	2, 294	2, 232	2, 994	4, 158	2, 482	3, 088	3, 570
Domestic	2, 098	1, 028	1, 342	1, 532	1, 896	1, 590	4, 002
Ledger cards:							
Foreign societies	4, 194	.....	.....	.....	.....	4, 339	.....
Domestic societies	1, 070	.....	.....	.....	.....	1, 198	.....
Foreign individuals	4, 153	.....	.....	.....	.....	4, 437	.....
Domestic individuals	1, 556	.....	.....	.....	.....	2, 152	.....
Domestic packages sent	2, 001	787	1, 063	1, 410	1, 647	1, 664	1, 328
Invoices written	459	199	1, 889	2, 034	341	788	795
Cases shipped abroad	16	33	81	73	24	71	27
Acknowledgments recorded:							
Foreign	908	934	572	791	700	708	594
Domestic	558	471	373	512	686	637	560
Letters:							
Recorded	86	87	108	115	93	72	127
Written	146	147	220	166	131	201	177

Transactions of the exchange office of the Smithsonian Institution during the fiscal year 1888-'89—Continued.

	1889. Feb.	Mar.	Apr.	May.	June.	Total.	Increase over 1887-'88.
Number of packages received	3, 926	10, 432	3, 032	5 107	12, 218	75, 966	859
Weight of packages rec'd (lbs.)	12, 233	18, 972	9, 931	12, 002	25, 560	179, 928	30, 298
Entries made :							
Foreign	4, 560	4 304	3, 006	5, 186	8, 268	46, 142	5, 994
Domestic	1, 542	1, 302	1, 282	2, 078	1, 164	18, 256	*5, 254
Ledger cards :							
Foreign societies						4, 466	331
Domestic societies						1, 355	290
Foreign individuals						4, 699	656
Domestic individuals						2, 610	861
Domestic packages sent	1, 293	1, 426	971	2, 575	1, 053	17, 218	4, 917
Invoices written	886	1, 371	886	985	3, 462	14, 095	570
Cases shipped abroad	40	96	51	57	124	693	30
Acknowledgments recorded :							
Foreign	491	389	542	424	387	7, 440	*530
Domestic	472	757	345	928	583	6, 882	2, 074
Letters :							
Recorded	138	111	86	82	112	1, 214	152
Written	143	225	161	102	231	2, 050	246

* Decrease.

Or for comparison with the number of packages handled during recent years :

Packages.	1886-'87.	1887-'88.	1888-'89.
Received	52, 218	75, 107	75, 966
Shipped :			
Domestic	10, 294	12, 301	17, 218
Foreign	41, 424	62, 306	58, 035

The small increase in the number of packages (859) received during 1888-'89 as compared with the preceding fiscal years, though offset by the large increase in weight (30,298 pounds), is accounted for by the fact that a number of regular shipments from Government bureaus were delayed beyond the close of the fiscal year.

EXPENSE.

From an examination of the books of the disbursing officer it appears that the actual cost of the exchange service for the year has been \$17,152.10, divided as follows :

Salaries and compensation of employés	\$11, 479. 25
Salaries of foreign agents (London and Leipzig)	1, 500. 00
Freight	2, 555. 23
Packing-boxes	586. 20
Printing, postage, stationery, and miscellaneous	1, 031. 42
Total	17, 152. 10

Fifteen thousand dollars of this sum were appropriated directly by Congress for "the expenses of the system of international exchanges * * * under the direction

of the Smithsonian Institution," \$1,363.54* were repaid to the Institution by Government Departments to which specific appropriations had been granted for this purpose, leaving a deficit of \$788.56, which was paid from the Smithsonian fund.

Although all of the Government bureaus that have occasion to transmit their publications through the Institution are not provided with funds available for defraying the cost of the service, it seems to have been the intention of Congress that its specific appropriation for the exchange business should be supplemented by special appropriations to some of the bureaus and departments of the Government, so that the charge of 5 cents per pound weight imposed by the regents in 1878 might be met by them. The average amount annually repaid to the Institution in this way during the past eleven years has been about \$1,400.

Dr. Kidder strongly recommended, and I beg to renew his recommendation, that this procedure, for which sufficient reasons existed at the time of its adoption, may now be discontinued as no longer advantageous or economical. By the present system the cost of the service is actually larger than appears in the specific appropriations for exchanges, and, as the special appropriations to the different Departments vary from year to year and are often omitted altogether, a burden which can not be accurately foreseen, is imposed upon the Smithsonian fund.

In order to effect the change contemplated—that is, to collect in a single item the entire appropriation for international exchanges, and at the same time to make allowance for a proper compensation to the ocean steam-ship companies for freight, and to bring the schedule of salaries more nearly up to the standard established for the classified service of the Government—an estimate of \$27,500 was submitted for the fiscal year 1889-'90.

This sum would then have been divided somewhat as follows:

Salaries.....		\$16,600
Transportation:		
From Washington to seaboard.....	\$2,280	
Ocean freight.....	5,000	
From point of debarkation to destination.....	1,750	
		9,030
Boxes.....		950
Incidentals.....		920
		1,870
Total.....		\$27,500

The amount finally appropriated was \$15,000, no increase having been granted.

CORRESPONDENTS.

The number of correspondents has been increased during the year by 2,157, making the total number now upon our books 13,130, classified as follows:

	Foreign.	Domestic.
Societies and institutions.....	4,466	1,355
Individuals.....	4,699	2,610

*The items in the report of the executive committee—\$2,329.99 under the head of expenditures for exchanges, and \$2,189.52 repayments—include receipts and expenditures made on account of the preceding fiscal year.

The geographical distribution is—

Country.	Establishments.	Individuals.
Africa	60	61
America :		
British America	106	250
Central America	14	24
Mexico	60	76
South America	152	148
United States	1,355	2,610
West Indies	24	65
	1,711	3,173
Asia	145	162
Australasia	130	95
Europe	3,766	3,802
Polynesia	9	16
Total	5,821	7,309

INTERNATIONAL EXCHANGE OF OFFICIAL DOCUMENTS, ETC.

The convention between the United States of America, Belgium, Brazil, Italy, Portugal, Servia, Spain, and Switzerland for the international exchange of official documents and scientific and literary publications, as well as the convention between the same countries (excepting Switzerland), for the "immediate exchange of the official journals, parliamentary annals and documents," was ratified by the President of the United States on July 19, 1888, but final ratifications were not exchanged by the representatives of the contracting powers until January 14, 1889. The convention was proclaimed on January 25, the day following, and since that date formal notification has been received of the adhesion to both conventions of the Government of Uruguay. The full text of these conventions was given in the Curator's report for last year.

The adhesion of the United States to the first of these conventions involves no new departure in the exchange service from the methods of previous years; but for the fulfillment of the obligations incurred by the second convention—the immediate exchange of official journals—an appropriation of about \$2,000 to cover the necessary postage and additional clerical assistance is required, and provision should be made for the prompt delivery to the exchange office of the documents referred to.

This sum of \$2,000 was estimated in reply to an inquiry made by the Secretary of State, dated February 12, 1889, as to the ability of the Smithsonian Institution to execute all of the provisions of the two conventions without further legislation by Congress, and the estimate was duly submitted by the Secretary of State in a letter to the President of the Senate, but no appropriation was made.

While the United States is thus bound by formal agreement to an exchange of its official publications with but eight countries, a full set of all publications received from the Government Printer is transmitted to forty-one countries upon the basis of mutual agreement.

A complete list of the official depositories for publications sent abroad during the fiscal year, in accordance with the act of Congress of July 25, 1868, with a statement of the number of packages sent and received from each of the countries represented, is contained in the annexed table:

Condition of parliamentary exchanges, 1888-'89.

Country.	Depository.	No. of publications—	
		Sent to.	Received from.
Argentine Republic...	Minister of Foreign Affairs, Buenos Ayres.	553	.....
Austria	I. and R. Statistical Central Commission, Vienna.	553	4,426
Baden	Minister of Foreign Affairs, Karlsruhe.	553	11
Bavaria	Royal Public Library, Munich	553	.....
Belgium	Royal Public Library, Brussels	553	16
Buenos Ayres	Minister of Foreign Affairs of the Province of Buenos Ayres.	553	.....
Brazil	Central Commission of Exchanges, Rio Janeiro.	553	.....
Canada	Parliamentary Library, Ottawa	553	.....
Canada	Legislative Library, Toronto	553	.....
Chili	National Library, Santiago	553	.....
Colombia	National Library, Bogota	553	.....
Denmark	Royal Library, Copenhagen	553	.....
France	Exchange Bureau, Paris	553	47
Germany	Library of the German Parliament, Berlin.	553	114
Great Britain	British Museum, London	553	10
Greece	United National and University Library, Athens.	553	.....
Hayti	Minister of Foreign Affairs, Port-au-Prince.	553	.....
Hamburg	City Government, Hamburg .....	.....	21
Hawaii	Minister of Foreign Affairs, Honolulu.	.....	68
Holland	Library of the Parliament, The Hague.	553	57
Hungary	President of the Hungarian Ministry, Budapest.	553	200
India	Secretary to the Government of India, Calcutta.	553	.....
Italy	National Victor Emanuel Library, Rome.	553	122
Japan	Minister of Foreign Affairs, Tokio	553	.....
Mexico	Minister of Justice and Public Instruction, Mexico City.	553	.....
New South Wales	Parliamentary Library, Sydney	553	.....
New Zealand	Parliamentary Library, Wellington	553	.....
Norway	The Royal Government, Christiania ..	553	9
Peru	National Library, Lima	553	.....
Portugal	Minister of Foreign Affairs, Lisbon	553	.....
Prussia	Royal Public Library, Berlin	553	.....
Queensland	Colonial Library, Brisbane	553	213
Russia	Imperial Public Library, St. Petersburg.	553	.....
Saxony	Royal Public Library, Dresden	553	80
South Australia	Government, Adelaide	553	.....
Spain	Government, Madrid	553	.....
Sweden	Royal Library, Stockholm	553	32
Switzerland	Central Library, Bern	553	.....
Tasmania	Parliamentary Library, Hobart Town.	553	3
Turkey	General Ottoman Library, Constantinople.	553	.....
Venezuela	University Library, Caracas	553	.....
Victoria	Public Library, Melbourne	553	355
Württemberg	Royal Public Library, Stuttgart	553	652
	Total	22,673	6,442

The utter inadequacy of the return received by the United States, 6,442 volumes and pamphlets for 22,673 sent out, is but a repetition of the experience of previous years, and has been dwelt upon at length in former reports. The Austrian Government forms a notable exception to the general apathy of foreign nations in the matter, having transmitted 4,426 volumes, including complete and very valuable sets of Parliamentary Proceedings; and it is hoped that negotiations now in progress will result, in the near future, in a more equitable and satisfactory exchange with other nations, more especially with England and Germany.

If a complete account of all "governmental" exchange business carried by the Smithsonian Institution is made, that is, if all publications sent or received by the Government and its bureaus are included, it appears that 9,325 packages were received and forwarded to United States Government Departments, including the Library of Congress, while 25,671 were sent abroad through the exchange service from the same Departments. The apportionment among the different countries is shown below:

The United States Government, including Departmental Bureaus, in exchange with—	Number of publications—	
	Sent by the United States.	Received by the United States.
Africa	47	.....
Argentina	1,192	89
Austria	753	5,059
Baden	553	11
Bavaria	553	.....
Belgium	697	121
Brazil	796	152
British America	1,171	.....
Chili	601	3
China	5	158
Colombia	572	.....
Central America	76	179
Denmark	580	290
Ecuador	1	.....
France	802	498
Germany	1,147	217
Great Britain	807	10
Greece	586	81
Hayti	553	.....
Hamburg .....	.....	21
Hungary	553	200
India	603	128
Italy	593	191
Japan	634	.....
Mexico	667	.....
Netherlands	579	115
New South Wales	579	52
New Zealand	591	.....
Norway	684	12
Paraguay	3	.....
Peru	562	.....
Polynesia	12	68
Portugal	591	.....
Prussia	553	.....
Queensland	570	411
Roumania	6	77
Russia	627	1
Saxony	553	80
South Australia	568	.....
Spain	553	.....
Sweden	667	82

The United States Government, including Departmental Bureaus, in exchange with—	Number of publications—	
	Sent by the United States.	Received by the United States.
Switzerland	561	3
Tasmania.....	553	3
Turkey.....	553	.....
Uruguay.....	15	.....
Venezuela.....	562	.....
Victoria.....	622	355
West Indies.....	12	.....
Württemberg.....	53	658

EFFICIENCY OF THE SERVICE.

While a marked improvement appears to have taken place in the exchange service during the past few years, still further improvements are no doubt desirable and possible. The plan adopted by Dr. Kidder of following up promptly and diligently all complaints, or failures of packages to reach their destinations, has produced excellent results. The delays due to the fact that the Smithsonian Institution is dependent upon the generosity and public spirit of most of the ocean steam-ship lines for the free transportation of its exchange boxes will be provided against, if the appropriation asked for is granted by Congress. The delays which occur in some of the foreign bureaus, due to indifference or to insufficient clerical force, are at present beyond the control of the Institution. Where regularly paid agencies have been established, as in London and Leipzig, this cause of embarrassment to the service no longer exists, and all packages are transmitted with promptness.

Still another difficulty arises from an inadequate or erroneous address upon the packages, rendering it necessary for the agent to hold them until the error or omission can be corrected by correspondence. Increased attention to this point on the part of those who have occasion to send publications through the exchange service will assist materially in decreasing the number of delayed transmissions.

An important need of the exchange bureau is a more complete index to the early records, but with the present clerical force this additional work can not be effectually undertaken.

I take pleasure in bearing witness to the faithfulness and efficiency of the employés of the bureau, and to the prompt attention to the interests of the Institution of its foreign agents, Messrs. William Wesley & Son, at London, and Dr. Felix Flügel, at Leipzig.

The employés of the bureau receive much lower salaries than those established for similar grades of work by the classified lists of the Government Departments, and it is manifestly to the interest of the service to be able to retain, by reasonable expectation of promotion, men who have acquired peculiar and valuable experience in the exchange transactions.

Grateful acknowledgments are due the following transportation companies and firms for their continued liberality in granting free freight on exchange parcels and boxes:

- Allan Steam-ship Company (A. Schumacher & Co., agents), Baltimore.
- Anchor Steam-ship Line (Henderson & Brother, agents), New York.
- Atlas Steam-ship Company (Pim, Forwood & Co., agents), New York.
- Bailey, H. B., & Co., New York.
- Bixby, Thomas E., & Co., Boston, Mass.
- Borland, B. R., New York.

Boulton, Bliss & Dallett, New York.
 Cameron, R. W., & Co., New York.
 Compagnie Générale Transatlantique (A. Forget, agent), New York.
 Cunard Royal Mail Steam-ship Line (Vernon H. Brown & Co., agents), New York.
 Dennison, Thomas, New York.
 Florio Rubattino Line, New York.
 Hamburg American Packet Company (Kunhardt & Co., agents), New York.
 Inman Steam-ship Company, New York.
 Merchants' Line of Steamers, New York.
 Muñoz y Espriella, New York.
 Murray, Ferris & Co., New York.
 Netherlands American Steam Navigation Company (W. H. Vanden Toorn, agent),
 New York.
 New York and Brazil Steam-ship Company, New York.
 New York and Mexico Steam-ship Company, New York.
 North German Lloyd (agents, Oelrichs & Co., New York; A. Schumacher & Co.,
 Baltimore).
 Pacific Mail Steam-ship Company, New York.
 Panama Railroad Company, New York.
 Red Star Line (Peter Wright & Sons, agents), Philadelphia and New York.
 White Cross Line of Antwerp (Funch, Edye & Co., agents), New York.
 Wilson & Asmus, New York.

In conclusion, I beg leave to add a list of correspondents that courteously act as agents of the Institution for the transmission of exchanges, and also a copy of the rules of the exchange service, calling especial attention to the necessity of observing rules 3 and 8, which provide that all packages sent shall be carefully addressed, and that all packages received from the Smithsonian shall be promptly acknowledged upon the receipt form which will always be found inclosed therein.

LIST OF THE FOREIGN CORRESPONDENTS OF THE SMITHSONIAN INSTITUTION ACTING
 AS ITS AGENTS FOR THE INTERNATIONAL EXCHANGES.

Algeria : Bureau Français des Echanges Internationaux, Paris, France.
 Austria-Hungary : Dr. Felix Flügel, 57 Sidonien Strasse, Leipzig, Germany.
 Brazil : Comissão Central Brasileira de Permutações Internacionais, Rio Janeiro.
 Belgium : Commission des Echanges Internationaux, Rue du Musée, No. 5, Bruxelles.
 British America : McGill College, Montreal ; or Geological Survey Office, Ottawa.
 British Colonies : Crown Agents for the Colonies, London, England.
 British Guiana : The Observatory, Georgetown.
 Cape Colony : Agent-general for Cape Colony, London, England.
 China : Dr. D. W. Doberck, government astronomer, Hong-Kong ; for Shanghai,
 United States consul-general, Shanghai.
 Chili : Museo Nacional, Santiago.
 Colombia (United States of) : National Library, Bogotá.
 Costa Rica : Biblioteca Nacional, San José.
 Cuba : Prof. Felipe Poey, Calle del Principe Alfonso, No. 416 Havana.
 Denmark : Kong. Danske Videnskabernes Selskab, Copenhagen.
 Dutch Guiana : Surinaamsche Koloniaale Bibliotheek, Paramaribo.
 East India : Secretary to the Government of India, Calcutta.
 Ecuador : Observatorio del Colegio Nacional, Quito.
 Egypt : Institut Egyptien, Cairo.
 France : Bureau Français des Echanges Internationaux, Paris.
 Germany : Dr. Felix Flügel, 57 Sidonien Strasse, Leipzig.

- Great Britain and Ireland: William Wesley & Son, 28 Essex street, Strand, London.
- Greece: United National and University Library, Athens.
- Guatemala: Instituto Nacional de Guatemala, Guatemala.
- Guadeloupe: (Same as France.)
- Haiti: Sécérétaire d'état des relations extérieures, Port au Prince.
- Island: Islands Stiptisbokasáfn, Reykjavík.
- Italy: Biblioteca Nazionale Vittorio Emanuele, Rome.
- Japan: Minister of Foreign Affairs, Tokio.
- Java: (Same as Holland.)
- Liberia: Liberia Colledge, Monrovia.
- Madeira: Director-General, Army Medical Department, London, England.
- Malta: (Same as Madeira.)
- Mauritius: Royal Society of Arts and Sciences, Port Louis.
- Mozambique: Sociedad de Geographia, Mozambique.
- Mexico: Sr. Ministro de Justicia e Instruccion Pública, City of Mexico.
- New Caledonia: Gordon & Gotch, London, England.
- Newfoundland: Postmaster-General, St. Johns.
- New South Wales: Royal Society of New South Wales, Sydney.
- Netherlands: Bureau Scientifique Central Néerlandais, Leiden.
- New Zealand: Colonial Museum, Wellington.
- Norway: Kongehge Norske Frederiks Universitet, Christiania.
- Paraguay: Government, Asunción.
- Peru: Biblioteca Nacional, Lima.
- Philippine Islands: Royal Economical Society, Manilla.
- Polynesia: Department of Foreign Affairs, care of Capt. H. W. Mist, Honolulu.
- Portugal: Bibliotheca Nacional, Lisbon.
- Queensland: Government Meteorological Observatory, Brisbane.
- Roumania: (Same as Germany.)
- Russia: Commission Russe des Echanges Internationaux, Bibliothèque Impériale Publique, St. Petersburg.
- St. Helena: Director General, Army Medical Department, London, England.
- San Salvador: Museo Nacional, San Salvador.
- Servia: (Same as Germany.)
- South Australia: Astronomical Observatory, Adelaide.
- Spain: R. Academia de Ciencias, Madrid.
- Sweden: Kongliga Sevenska Vetenskaps Akademien, Stockholm.
- Switzerland: Central Library, Bern.
- Tasmania: Royal Society of Tasmania, Hobarton.
- Turkey: Bibliothèque Générale Ottomane, Constantinople.
- Uruguay: Bureau de Statistique, Montevideo.
- Venezuela: University Library, Caracas.
- Victoria: Public Library, Museum, and National Gallery, Melbourne.

RULES FOR THE TRANSMISSION OF SCIENTIFIC AND LITERARY EXCHANGES.

1. Transmissions through the Smithsonian Institution must be confined exclusively to books, pamphlets, charts, and other printed matter sent as donations or exchanges, and can not include those procured by purchase.

The Institution and its agents will not knowingly receive for any address purchased books, nor apparatus and instruments, philosophical, medical, etc. (including microscopes), whether purchased or presented: nor specimens of natural history, except where special permission from the Institution has been obtained.

2. Before transmission, a list of packages, with the address on each package, is to be mailed by the sender to the Smithsonian Institution, when sent from the United States, or to the foreign agent of the Institution when sent from abroad. The Institution must be informed by mail of each sending on the day of transmission.

3. Packages must be legibly addressed and indorsed with the name of the sender

4. Packages must be enveloped in stout paper, securely closed, and tied with strong twine.
5. No package to a single address is allowed to exceed one-half of one cubic foot in bulk.
6. Packages must not contain letters, or written matter.
7. Packages must be delivered to the Smithsonian Institution or its foreign agents free of expense.
8. Packages must contain a blank acknowledgment, to be signed and returned by the party addressed.
9. If returns are desired, the fact should be explicitly stated on the package.
10. Packages received through the agency of the Smithsonian Institution must be acknowledged without delay by mail.
11. The Institution assumes no responsibility beyond that of the delivery of the packages.

SMITHSONIAN INSTITUTION,
Washington.

S. P. LANGLEY
Secretary Smithsonian Institution.

Very respectfully,

W. C. WINLOCK,
Curator of Exchanges.

APPENDIX III.

REPORT ON THE LIBRARY.

SIR: I have the honor respectfully to submit my report on the work of the library during the year from July 1, 1888, to June 30, 1889.

The work of recording and caring for accessions has been carried on as during the preceding year, the entry numbers on the accession-book running from 182,060 to 193,430.

The following condensed statement shows the number and character of these accessions:

PUBLICATIONS RECEIVED BETWEEN JULY 1, 1888, AND JUNE 30, 1889.

Volumes:		
Octavo or smaller.....	1,002	
Quarto or larger.....	498	
	1,500	
Parts of volumes:		
Octavo or smaller.....	5,556	
Quarto or larger.....	6,646	
	12,202	
Pamphlets:		
Octavo or smaller.....	2,705	
Quarto or larger.....	473	
	3,178	
Maps.....	473	
Total.....		17,353

Of these accessions, 4,810 (namely, 441 volumes, 3,752 parts of volumes, and 617 pamphlets) were retained for use in the Museum library, and 521 medical dissertations were deposited in the library of the Surgeon-General's Office, U. S. Army.

The remainder were promptly sent to the Library of Congress on the Monday following their receipt.

Among the most important additions to the list of serials during the year may be specified the following publications:

<p>American Angler. American Field. American Grocer. Bollettino di paletnologia Italiana. Cosmos (formerly "Les Mondes"), Paris. Export Journal. Forest Leaves. Gazzetta Chimica Italiana. Himmel und Erde. Journal of American Folk-Lore. Journal of the Gypsy Lore Society. Journal of the Marine Biological Association of the United Kingdom. Journal of the Society of Chemical Industry. Life-Lore. Manufacturer and Inventor. Menorah.</p>	<p>Monatshefte für Chemie (published by the Vienna Academy of Sciences). "Old New York." Orientalische Bibliographie. Pittonia. Praktische Physik. Recneil des Travaux Chimiques des Pays-Bas. Reports from the laboratory of the Royal College of Physicians, Edinburgh. Research. Revue des Traditions Populaires. Revista di Mineralogia e cristallografia Italiana. Shooting and Fishing. The Steamship. Studies from the Museum of Zoology, University College, Dundee. Victorian Naturalist.</p>
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The following universities have sent complete sets of all their academic publications for the year, including the inaugural dissertations delivered by the students on graduation: Bern, Bonn, Dorpat, Erlangen, Freiburg-im-Breisgau, Giessen, Göttingen, Halle-an-der-Saale, Heidelberg, Helsingfors, Jena, Kiel, Königsberg, Leipzig, Louvain, Lund, Tübingen, Utrecht, and Würzburg.

Among other important accessions during the year may be mentioned the following:

From the office of the secretary of state for India, London, a large series of Indian Government publications, including the final volumes (Vols. 12, 13, and 14) of the great Gazetteer of India, and Part I of the Catalogue of Sanskrit Manuscripts in the library of the India Office; full sets of official publications from the Italian Government, the Canadian Government, and the colonial government of New Zealand; from the Museum d'Histoire Naturelle at Lyons, the two magnificent works, *Archéologie de la Meuse*, by F. Liénard, in six large volumes, and *Recherches Anthropologiques dans le Caucase*, by E. Chantre, in five large volumes; *Moeurs et Monuments Préhistoriques*, from the author, the Marquis de Nadaillac; a further set of scientific papers from Prince Albert of Monaco; Catalogue des Monnaies Musulmanes de la Bibliothèque Nationale, from the National Library in Paris; Vol. 3 of the Reports of the German Commission for the Observation of the Transit of Venus; Vols. 26, 27, 28, 29, 30, and 31 of the *Challenger* Report (Zoology), from the British Government; from the Egypt Exploration Fund, the Memoirs on Tanis, Part II, The Store-City of Pithom, Naukratis, Part I, and The Shrine of Saft-el-Henneh, as well as a complete set, in duplicate, of all the memoirs published by this association, presented to the Institution as a return for its services in distributing the publications of the association in America; the first volume of the Fossils of the British Islands, presented by the delegates of the Clarendon Press, Oxford; a large volume of Memoirs on Whales and Seals, from the author, Sir William Turner, Edinburgh; a set of nineteen large volumes and pamphlets, catalogues of manuscripts, and special collections of books, from the Royal Library at Berlin; the third section of Vol. 2 of the great *Corpus Inscriptionum Atticarum*, from the same library; a series of fourteen catalogues of the various collections in the Royal Museum at Berlin; a complete file of the *Zeitschrift für Ethnologie*, from 1884 to date, from the Berliner Gesellschaft für Anthropologie, Ethnologie, und Urgeschichte; full sets of publications, including charts from the hydrographic offices of Great Britain, Denmark, Italy, and Russia; Vol. 1 of *Expéditions Scientifiques du Travailleur et du Talisman*, containing the fishes, by L. Vaillant, from the Bureau Française des Échanges Internationaux, which also sent a large series of other important publications of the French Government; a large series of government reports from the Hawaiian Government; Mean Scottish Meteorology, from the author, Prof. C. Piazza Smyth; Part 5 of Lilljeborg's *Sveriges och Norges Fiskar*; and a gorgeously illustrated work from his highness the Maharaja of Ulwar, entitled *Ulwar and its Art Treasures*, by Thomas Holbein Hendley.

Very respectfully submitted.

JOHN MURDOCH,
Librarian.

Prof. S. P. LANGLEY,
Secretary of the Smithsonian Institution.

