SECTION I.

REPORT

UPON THE

CONDITION AND PROGRESS OF THE U. S. NATIONAL MUSEUM DURING THE YEAR ENDING JUNE 30, 1888.

BY

G. BROWN GOODE,

ASSISTANT SECRETARY SMITHSONIAN INSTITUTION, IN CHARGE OF U. S. NATIONAL MUSEUM.

REPORT

UPON

THE CONDITION AND PROGRESS OF THE U. S. NATIONAL MUSEUM DURING THE YEAR ENDING JUNE 30, 1888.

BY

G. BROWN GOODE,

Assistant Secretary, Smithsonian Institution, in charge of the National Museum.

A.—GENERAL CONSIDERATIONS.

In January, 1847, the first Board of Regents after many weeks of consultation and deliberation over the plans for the organization of the Smithsonian Institution unanimously voted the following resolution:

*Resolved, That it is the intention of the act of Congress, and in accordance with the design of Mr. Smithson, as expressed in his will, that one of the principal modes of executing the act and the trust, is the accumulation of collections of specimens and objects of natural history and of elegant art, and the gradual formation of a library of valuable works pertaining to all departments of human knowledge, to the end that a copious store-house of materials of science, literature, and art may be provided, which shall excite and diffuse the love of learning among men, and shall assist the original investigations and efforts of those who may devote themselves to the pursuit of any branch of knowledge.**

This was a high ideal for the future National Museum, but it is one which it has been year after year more closely approaching, and it is hoped that the present report will show that the work accomplished during the fiscal year of 1887–'88 has brought us still nearer to its realization.

With the death of Professor Baird, August 19, 1887, the National Museum passed from under the direction of the mind by which its policy had been planned for many years. If his biography could be properly written, it would include a full history of the Museum, as well as of the Fish Commission, and in minor degree of the Smithsonian Institution itself, for as secretary and assistant secretary he was associated with nearly every phase of its activity during thirty-seven of its forty-one years of corporate existence. With the Fish Commission, first of all, his name is identified as its founder as well as its chief adminis-

* Report of Committee on Organization, p. 20

trator, and with the National Museum almost as closely, though less exclusively, since, though not its originator nor its sole director, his was, as has been said, for a very long time the master mind in its management. His relation to it was very similar to that held by Sir Henry Cole to the great national establishment at South Kensington in England, so well described in the volumes entitled "Fifty Years of Public Work," and recently published by his son, Mr. Alan Cole.

With the death of Professor Baird the Museum must of necessity enter upon a new period in its history, for his successors, be they never so desirous of perpetuating his policy, can not apply to its management the same kind of supervision, nor the result of such a life-time of experience and observation.

Upon the firm foundation which he has laid they must build a superstructure, harmonious in plan, but, it may be, different in proportions and even in material. Their safest course must be not to work as he did, under circumstances different from those which are henceforth to exist, but to try to work as he would have done in connection with these changed circumstances.

EARLY HISTORY OF THE MUSEUM.

The idea of a national museum in the city of Washington was first suggested by the Hon. Joel Roberts Poinsett, of South Carolina, Secretary of War under President Van Buren, who in 1840 organized, for the purpose of establishing such a museum, a society called "The National Institution," afterwards "The National Institute," which was exceedingly prosperous and active for four years. By this Society the nucleus for a national museum was gathered in the Patent Office building in Washington, and public opinion was educated to consider the establishment of such an institution worthy of the attention of the Government of the United States. In 1846, having failed in securing the public recognition at which it aimed, and the Smithsonian Institution being by its charter entitled to take possession of the extensive Government collections already assembled in its charge, the society became torpid, and eventually, in 1861, passed out of existence.

From 1844 to 1858, when the so-called "National Cabinet of Curiosities" passed into the charge of the Smithsonian Institution, the term "National Museum" was in disuse. From that time onward, however, it was used, unofficially, to designate the collections in the Smithsonian building.

After the "National Cabinet" was delivered to the Regents, appropriations were made by Congress for its maintenance. During the twenty-three years which followed, the collections were greatly increased and were made the subjects of numerous important memoirs upon the natural history and ethnology of America. The public halls, with their arrangements for the exhibition of a portion of the collections, also received a due share of attention, and a certain amount of instruction and

pleasure was afforded to visitors. The appropriations, however, were meagre, the space limited, and the staff was so inadequate that little could be done except to keep the collections in good preservation.

The Exhibition of 1876 in Philadelphia was an event of great educational importance to the people of the United States; and not the least of its benefits were the lessons it taught as to the possibilities for good in public museums. The objects which at the close of the Centennial were given to the United States for its National Museum were of much intrinsic value, but were still more important in that they led to the erection of a large building for the expansion of the Museum itself.

From 1876 to 1881 was a period of quiet preparation for future effort. From 1881 to 1888, another period of seven years, its growth has been rapid, though the organism is still in its infancy. These seven years have been years of experiment, but it is hoped that it is now evident to the people and to Congress that the young museum is now ready to begin a promising progress toward maturity.

PROGRESS IN THE WORK OF THE MUSEUM.

Among the more important features of the work, up to the present time, certain definite steps of progress have been taken, among the most important of which may be mentioned:

(1) An organization of the Museum staff has been effected—efficient for present purposes and capable of expansion and extension as occasion may require.

(2) Through the agency of this staff, the materials in the Museum, the accumulations of nearly half a century, have been examined, classified, and brought under control.

(3) The collections have been almost quadrupled in extent.

(4) A beginning has been made toward the development of a thoroughly labeled exhibition series, available for the instruction of the public.

(5) A thorough study of the organizations and systems of classification in other museums throughout the world has been made, the results of which are beginning to appear in the work of the Museum staff. A report upon the great museums of the world is in preparation and will soon be published.

(6) Many new methods of installation have been developed by experiments in the Museum, and in the expositions in which the Museum has participated. These are finding favor, and are being adopted in many similar establishments at home and abroad, and will certainly add to the economy and success of our own administration.

(7) Science has been forwarded by the publication of many hundreds of papers describing the materials in the Museum, while the work of specialists in the production of these papers has greatly improved the significance and value of the collections.

NECESSITY FOR A NATIONAL MUSEUM.

That the United States must have a National Museum is so evident that the proposition needs no argument for its support.

Every considerable nation has a museum or group of museums in its capital city—centres of scientific and educational activity—the treasure-houses of the nation, filled with memorials of national triumphs in the fields of science, art, and industrial progress.

They are legitimate objects of national pride, for upon the character of its museum and libraries intelligent persons visiting a country very properly base their judgment as to the nature and degree of the civilization of the people.

In most great cities, as I have said, there is a group of museums. London, for instance, has—

The British Museum, with its collection of books and manuscripts, its galleries of archæology, historic and prehistoric, its collection of coins, pottery, sculpture, etc.
The Natural History Museum (devoted to botany, mineralogy, and geology).
The South Kensington Museum (arts and art-manufactures).
The Bethnal Green Museum (industrial and decorative art).
The National Gallery of Art.
The National Portrait Gallery.
The Museum of Practical Geology.
The Museum of Economic Botany at Kew.
The Imperial Institute (commerce and natural resources of the British Empire).
The Parkes Museum of Hygiene.
The India Museum.
The Patent Musem.
The Hunterian Museum (comparative anatomy).
The Museum of Naval Architecture.
The National Museum of Fisheries, and others.

Paris has—

The Museum of the Louvre (art and archæology).
The Luxembourg Museum (modern art).
The Museum of Natural History and Comparative Anatomy in the Garden of Plants.
The Geological Museum.
The Ethnological Museum at the Trocadero.
The Museum of Arts and Manufactures.
The Museum of the City of Paris.
The St. Germain Museum (French archæology).
The Cluny Museum (costumes, furniture, and decoration (?)).
The Military Museum at the Hotel des Invalides.
The Guimet Museum (history of religion).
The Museum of Marine Architecture in the Louvre.
The Collections at the Gobelin and Sèvres establishments, and others.

Berlin, St. Petersburg, and Vienna have similar groups, and so have Florence, Christiania, Stockholm, Copenhagen, Leyden, Brussels, Madrid, Buda-Besth, Tokio, and other national establishments.

It should be borne in mind that here in Washington under the roofs of the Smithsonian and New Museum buildings are grouped together collections which in London, Paris, or any other of the European capitals are provided for in a group of museums, for accommodating

which a much larger number of equally commodious buildings is found needful.

POSSIBILITIES OF THE FUTURE.

It is possible, as I remarked in last year's report, to show that Washington may readily be made the seat of one of the greatest museums in the world. It will perhaps be neither practicable nor desirable to gather together in Washington collections of ancient mediæval art, such as those which adorn the capitals of Europe; but a representative series of such objects will undoubtedly grow up, which shall tend to educate the public taste, and to promote, so far as possible, the study of the elements of art and the history of civilization, as well as to forward the growth of the arts of design. This having been accomplished, the attention of the Museum should be directed mainly toward the exhibition of the geology and natural history of America, and its natural resources, to the preservation of memorials of its aboriginal inhabitants, and the exposition of the arts and industries of America.

It is evident that the National Museum of the United States will of necessity have features peculiar to itself, developed in response to the peculiar needs of the people of this continent. It should be remembered that the national collections of every principal European nation are divided into several groups, each under separate administration, though often within the general control of some central authority. In France, for instance, most of the museums are under the Ministry of Public Instruction, and in England, to a less extent, under the Department of Science and Art.

In the great European capitals the public collections are scattered through various parts of the cities, in museums with distinctive names and independent in their organizations. Much of the work which should properly be done by such museums is omitted, because no one of them has seen fit to undertake it; while, on the other hand, much labor is duplicated, which is perhaps equally unfortunate, collections of similar scope and purpose being maintained in different parts of the same city. One of the chief objections to such division of effort is that much of the value of large collections in any department is lost by failure to concentrate them where they may be studied and compared side by side. In Washington the national collections are all, without exception, concentrated in one group of buildings. The Army Medical Museum now occupies a building side by side with those under the control of the Smithsonian Institution, and this proximity, in connection with the long-established policy of co-operation between the two organizations, will cause them to be, for all practical purposes, united in interest.

POSSIBILITIES OF INCREASE AND IMPROVEMENT.

Although the appropriations from the public treasury for the maintenance of a national museum are small, compared with those in several European countries, the value of objects given by private individ-

uals is proportionately larger. The actual value of such contributions for ten years past, has not, it is estimated, fallen short of $20,000 a year, and in some years has been greater.

Among important gifts may be mentioned such as the George Catlin Indian Gallery, of inestimable value to the American historian and ethnologist; the Riley collection of North American insects, the finest in existence, containing 150,000 specimens, and easily worth $50,000; the collection bequeathed in 1887 by the late Isaac Lea, of Philadelphia, containing besides minerals and other objects, about 20,000 conchological specimens, and appraised by the State at $10,000; and the collection of the American Institute of Mining Engineers, for the transfer of which from Philadelphia to Washington, a special appropriation was made by Congress.

Some exceedingly valuable collections in this country and in Europe have been bequeathed to the Smithsonian Institution which have not yet come into its possession. Within the past ten years it is estimated that individuals to the number of at least a thousand have made gifts to the Museum to the value of $100 or more.

Of the fourteen hundred and eighty-two separate lots of specimens received within the past fiscal year at least one thousand were gifts, from nearly as many individuals—some of little value, others very important.

Not a day passes during which some stranger, pleased with the work of the Museum, does not voluntarily send in some contribution more or less important.

The National Museum now contains about 2,900,000 objects, distributed among the various departments, as is shown in the table on page 22, of this report.

The late Professor Baird was once asked whether the value of the collections in the National Museum was equal to the amount which had been expended in its maintenance. He replied, unhesitatingly, that although it would be by no means a fair criterion of their value he did not doubt that by a judicious and careful system of sale the entire sum could be recovered.

One of the most striking features in the affairs of the Museum is the manner in which its collections are increasing.

In 1887 the number of specimens was more than ten times as great as five years before.

In the last fiscal year twenty-five thousand new lots or groups of specimens were entered upon the Museum catalogue.

This increase, as has been shown, is in large degree spontaneous, only a small amount of money being available for the purchase of new material.

As might be supposed, a considerable proportion of the objects given duplicate material already on hand, and although these contributions can with the utmost advantage be used for distribution to other museums and schools, they do not increase as much as is desired the

value of the collections for study by specialists, and for general educational purposes. The need of a larger fund for the purchase of specimens is yearly more manifest. Exceedingly important material is constantly offered to us at prices very much below what it would cost to obtain it by collecting, and in many instances, when refused, it is eagerly taken by the museums and institutions of Europe.

The most enlightened nations of Europe do not hesitate to spend money liberally to promote the interests of their national museums.

For the purchase of specimens for the South Kensington Museum from 1853 to 1887 $1,586,634 was expended; or a yearly average of nearly $47,000.

Toward her other museums England is equally liberal. Exact statistics are not at hand, but it is quite within bounds to assert that her average expenditures for the purchase of new objects for museums in London is not less than $500,000 a year.

The museums of England are rich with the accumulations of centuries. The National Museum of the United States is young and has enormous deficiencies in every department. It needs, more than any museum in Europe, the opportunity to increase its resources through purchase. The total amount expended for the purchase of specimens for the National Museum since its foundation has not exceeded $20,000, and never in one year more than $8,500.

More has been expended for the improvement of two museums in the city of New York in the past four years than has ever been expended by the general Government upon the Museum in Washington.

Within the past year three mortifying instances have occurred of the inability of the National Museum to buy specimens needed to complete its collections.

A very valuable collection of minerals, absolutely essential to the national collections and for some years on deposit in the National Museum, was withdrawn by its owner and placed in a school museum in a neighboring city, because $4,000 could not be had for its purchase—a sum far below its value.

A collection of implements and weapons illustrating the history of the natives of Alaska, gathered by an officer in the U. S. Navy, and almost indispensable for the completion of the national ethnological collection, was sold to a museum in a neighboring city for $12,000, while the National Museum had no money to expend for such objects.

One of the most important collections of birds in America, the loss of which was a national misfortune, was taken from the city of Washington and sold to the British Museum for $10,000, no American institution having money available for its purchase.

Instances of this kind occur nearly every month in every year.

The National Museum has had the option for several years of the purchase at cost of $80,000 of a collection of minerals, which once acquired would enable its mineralogical department to rank among the first in the world. Congress has never been asked to make an appro-

priation for its purchase, simply because of unwillingness to ask for that which might not be granted. Minerals, having a money value, can readily be sold, and are not very often given to the Museum, and the poverty of its mineralogical collection is by no means creditable to the nation.

The Museum receives many valuable gifts from Government officials abroad, especially from those in the consular and diplomatic service, and in the Navy.

If the actual cost of gathering specimens could be paid, the time and experience of these men would gladly be given gratuitously. In this way, by the expenditure of a few thousands each year, extensive and important additions might be made to the national collections.

THE NECESSITY FOR A NEW MUSEUM BUILDING.

The National Museum is now approaching an important crisis in its history. Its future will depend upon the action of Congress in granting it an additional building, for without more room its growth can not but be in large degree arrested.

The necessity for additional room is constantly increasing, and several of the collections, to wit, transportation and engineering, fishes, reptiles, birds' eggs, mollusks, insects, marine invertebrates, vertebrate and invertebrate fossils, fossil and recent plants, are in some instances wholly unprovided for, and in others only in a very inadequate degree.

In the main hall of the Smithsonian building is still exhibited the collection of birds. A few cases containing birds' eggs and shells have recently been arranged along the center of this hall.

There are at the present time nineteen departments in the National Museum, eleven of which have no space assigned to them in the Museum building, solely on account of its crowded condition. The collection of prehistoric anthropological objects remains installed on the second floor of the Smithsonian building. The collections of the remaining ten departments can not be exhibited or even properly arranged and classified without more room. These collections are at present stored in the attics and basements of the Smithsonian and Armory buildings, and are inaccessible for study and for the other purposes for which they were obtained. The specimens comprising these collections are not simply objects of natural history, possessing an abstract interest to the student, but represent the application of natural objects to the industries, and, as such, are of great importance. There are several collections of ores, minerals, building stones, and of objects representing various arts and industries, which are of very great value, since they furnish to the American manufacturer and designer information of inestimable importance.

The increase in the national collections during the last six years may perhaps be best described by the statement that in 1882 the total number of specimens recorded in the Museum was about 183,000; while in 1887 the records indicated the possession of more than 2,900,000

specimens. It is proper to say in this connection that the actual increase was not so great as shown by the records, since during this period a large amount of material previously received had been brought under control and placed on the books of the Museum. It should also be borne in mind that the present Museum building was planned with reference to the reception of the material in its custody at the time of its construction.

In the Armory building there are at the present time several hundreds of boxes containing valuable material which has never been unpacked, since there is no space available for the display of the specimens. Many of the boxes contain collections which were brought to the Museum through the medium of special acts of Congress.

Independently of the collections obtained at expositions, a very large amount of material has been received from foreign Governments, among which may be mentioned those of Mexico, Central America, several of the South American States, and Japan, which have made extensive contributions to the zoölogical, geological, ethnological, and technological collections.

APPRECIATION BY FOREIGN NATIONS.

The new methods of work and of museum arrangement, which have grown up here, have attracted much attention abroad. Mexico, in 1887, sent the entire collections of the National Natural History Museums, then just being founded, to Washington, in charge of two of her principal naturalists, who passed six months at the National Museum identifying their material and studying the methods of administration. Costa Rica, forming a national museum, sent its director here for a six months' course of study.

Japan has sent the entire national collection of birds to the Museum to be studied and reported upon by one of the naturalists of the Museum staff.

Germany has been supplied with a complete set of plans and illustrations of methods of administration at the request of the Director of the National Zoölogical Museum.

In 1883, at the Fisheries Exhibition in London, the methods of the National Museum were strictly adhered to in the arrangement of the display made by the United States.

In 1888, in his address as president of the Anthropological Society of the British Association for the Advancement of Science, General Pitt-Rivers said that the American display at the Fishery Exhibition was the only thing done in the true spirit of modern science in the whole series of professedly scientific exhibitions held in London within the past six years.*

* The words of General Pitt-Rivers in 1888 are simply a repetition of what he said in 1883, made stronger by the observations of five more years of exhibitions in Europe.

In 1883 he wrote to the London Times:

SIR: In confirmation of the praise you justly bestow on the arrangement of the United States department in the Fisheries Exhibition I beg to draw attention to the

Such expressions of opinion, coupled with the constant praise with which European journals speak of the scientific work of our Government departments, can not but be gratifying, and it should be a matter of national pride to merit it.

THE RELATIONS OF THE MUSEUM TO THE SMITHSONIAN INSTITUTION.

The Smithsonian Institution, though it bears the name of a private citizen and a foreigner, has been for nearly half a century one of the principal rallying points of the scientific workers of America. It has also been intimately connected with very many of the most important scientific undertakings of the Government.

Many wise and enlightened scholars have given to its service the best years of their lives, and some of the most eminent scientific men our country has given birth to have passed their entire lifetime in work for its success. Its publications, six hundred and seventy in number, which when combined make up over one hundred dignified volumes, are to be found in every important library in the world, and some of them, it is safe to say, on the working table of every scientific investigator in the world who can read English.

Through these books, through the reputation of the men who have worked for it and through it, and through the good accomplished by its system of international exchange, by means of which within the past thirty-eight years 1,262,114 packages of books and other scientific and literary materials have been distributed to every region of the earth, it has acquired a reputation at least as far reaching as that of any other institution of learning in the world.

It is therefore representative of what is deemed in other lands the chief glory of this nation, for whatever may be thought in other countries of American art, of American literature, American institutions generally, the science of America is accepted without question as equal to the best.

In the scientific journals of Great Britain and other European countries, the reader finds most appreciative reviews of the scientific publications of the Smithsonian, the Museum, the Bureau of Ethnology, the Geological Survey, the Department of Agriculture, and the Fish Commission, and they are constantly holding up the Government of the United States, as an example to their own, of what governments should do for the support of their scientific institutions.

---

fact that in the whole exhibition it is the only one which is arranged historically. In the Chinese, Japanese, Scandinavian, and Dutch courts there are objects which the scientific student of the arts of life may pick out and arrange in the proper order in his own mind; but in that of the United States, following the method adopted in the National Museum in Washington, there has been attempted something more—to bring the department into harmony with modern ideas. This gives to the exhibition an interest which is apart from commerce, and an interest which is beyond the mere requirements of fish culture, and it may be regarded as one out of many indications of the way in which the enlightened Government of the United States mark their appreciation of the demands of science.

I have the honor to be, sir, yours obediently,

A. PITT-RIVERS.

It is surely a legitimate source of pride to Americans that their work in science should be so thoroughly appreciated by eastern nations, and it is important that the reputation should be maintained. Nothing can be more in consonance with the spirit of our Government, nor more in accord with the injunction of Washington in his "Farewell Address," lately admiringly quoted by Sir Lyon Playfair in his address as president of the British Association for the Advancement of Science:

Promote, then, as an object of primary importance, institutions for the general diffusion of knowledge.

In proportion as the structure of a government gives force to public opinion it should be enlightened.

No one has been able to show why Smithson selected the United States as the seat of his foundation. He had no acquaintances in America, nor does he appear to have had any books relating to America except two. Rhees quotes from one of these ["Travels through North America," by Isaac Weld, secretary of the Royal Society], a paragraph concerning Washington, then a small town of 5,000 inhabitants, in which it is predicted that "the Federal city, as soon as navigation is perfected, will increase most rapidly, and that at a future day, if the affairs of the United States go on as rapidly as they have done, it will become the grand emporium of the West, and rival in magnitude and splendor the cities of the whole world."

Inspired by a belief in the future greatness of the new nation, realizing that while the needs of England were well met by existing organizations such as would not be likely to spring up for many years in a new, poor, and growing country, he founded in the new England an institution of learning, the civilizing power of which has been of incalculable value. Who can attempt to say what the condition of the United States would have been to-day without this bequest?

In the words of John Quincy Adams:

Of all the foundations of establishments for pious or charitable uses which ever signalized the spirit of the age or the comprehensive beneficence of the founder, none can be named more deserving the approbation of mankind.

The most important service by far which the Smithsonian Institution has rendered to the nation, has been that from year to year, since 1846—intangible but none the less appreciable—by its constant co-operation with the Government, public institutions and individuals in every enterprise, scientific or educational, which needed its advice, support or aid from its resources.

There have been, however, material results of its activities, the extent of which can not fail to impress any one who will look at them; the most important of these are the *Library* and the *Museum*, which have grown up under its fostering care.

The library has been accumulated without aid from the treasury of the United States; it has, in fact, been the result of an extensive system of exchanges, the publications of the Institution having been used to

obtain similar publications from institutions of learning in all parts of the world.

In return for its own publications the Institution has received the books which form its library.

This library, consisting of more than a quarter of a million volumes and parts of volumes, has for over twenty years been deposited at the Capitol as a portion of the Congressional Library, and is constantly being increased. In the last fiscal year nineteen thousand titles were thus added to the national collection of books.

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 instances 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 of 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 their 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 increased from 40,000 to fully 250,000 volumes and parts of volumes, and form one of 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.

The purchasing power of the publications of the institution, when offered in exchange, is far greater than that of money, and its benefit is exerted chiefly in behalf of the National Library, and also to a considerable extent in behalf of the National Museum.

The amount expended during the past forty years from the private fund of the institution in the publication of books for gratuitous distribution has been $350,000, a sum nearly half as great as the original Smithson bequest.

These publications have had their influence for good in many ways, but in addition to this, a library much more than equal in value to the outlay, has through their buying power come into the possession of the nation.

In addition to all this, a large amount of material has been acquired for the Museum by direct expenditure from the private fund of the Smithsonian Institution. The value of the collections thus acquired is estimated to be more than equal to the whole amount of the Smithson bequest.

The early history of the Museum was much like that of the library. It was not until 1858 that it became the authorized depository of the scientific collections of the Government, and it was not until after 1876 that it was officially recognized as the National Museum of the United States.

But for the provident forethought of the Smithsonian Institution, the United States would probably still be without even a reputable nucleus for a National Museum.

The relations of the Museum to the system of popular lectures, for many years established in Washington, and the assistance which it affords each year to students of science, is referred to elsewhere in this report.

The Institution publishes many circulars giving information on scientific subjects which are distributed gratuitously to those who write to make inquiries, and this system is being continually extended. In addition to this, a large correspondence is carried on with people in search of information on scientific topics. Probably three thousand letters a year go out to people who write seeking to know the name of some object, or other scientific fact.* Inquiries of this kind are always answered promptly and fully, and frequently, to intelligent inquirers, books are sent, which will enable them to find out such names for themselves in future. This work has not only an educational value but often a great economic importance as well; as, for instance, when some common mineral has been mistaken for one of value, some useless plant has been wrongly identified and supposed to be of service in medicine, or some harmless animal feared as noxious.

The publications of the Institution and its dependencies reach every State and almost every county in the United States. A careful study of the subject recently made by the president of one of the scientific societies in Washington seems to indicate that there are several States which are reached by no scientific publications whatever except those distributed gratuitously by the Government.

Speaking of the Smithsonian Institution proper, and not of the Museum or any other trust that it administers, it may be stated that nothing could be so desirable for the Institution as that Congress should examine for itself whether, on the whole, in the execution of the trust of Smithson, more has been given to the Government than has been re-

* See statement on page 58.

ceived; for if, in attempting to increase and diffuse knowledge among mankind, the machinery of the Institution's action has been such that it has incidentally paid over to the Government the equivalent of much more than the whole original fund, these facts should surely be known to those who have to ask themselves in what spirit as well as for what purpose the Institution expends money placed in its charge.

Professor Langley has pointed out that "although by the judicious administration of the Smithson fund nearly a million and a half dollars—the fruits of its investment—have been applied during the past forty years to the advancement of science and education in America (in addition to the principal $703,000, larger now than ever before) it should be remembered that the income of the Institution is only $42,000 a year, a sum much smaller in its power to effect results than ever in previous years."

Can the United States fail to recognize its obligation to supplement liberally this private contriburion for public good, especially if it be born in mind that, as Professor Langley has recently shown, the Institution has left in perpetual charge of the nation, in the Museum alone, property acquired out of its private fund (and to which it has apparently the same title) which is probably now more than equal in value to the whole amount of the Smithsonian bequest.

THE EDUCATIONAL WORK OF THE MUSEUM.

The work of the Museum, if it only performed the functions of an institution for scientific investigation, would be of sufficient value to justify its maintenance and extension.

As a matter of fact, it not only performs these functions but also does a very great deal to render the resources of science available to the public at large.

Professor Huxley's definition of a museum was that it is "a consultative library of objects."

The National Museum is a consultative library for the scientific man, and it is something more. It aims to be an agency for the instruction of the people of the whole country, and to keep especially in mind the needs of those whose time is not devoted to the study of science.

The spirit in which the work of the Museum is being carried on was voiced in the address of one of its officers before the American Historical Association at its recent meeting in this city, in which it was said:

(1) *That public institutions of this kind are not intended for the few, but for the enlightenment and education of the masses.*

(2) *That the public has a right to full partieipation in the results of the work of the scientific establishments which they are helping to maintain.*

(3) *That one of the chief duties of the officers of these instutions is to provide means by which such results may be presented in an attractive as well as an intelligible form.*

No scientific institution is more thoroughly committed to the work of the diffusion of knowledge than is the Smithsonian Institution, and no

department of its activity is more capable of usefulness in this direction than is the National Museum.

The benefits of the Museum are extended not only to the specialists in its laboratories and to the hundreds of thousands of visitors, from all parts of the United States who pass its doors each year, but to local institutions and their visitors throughout the country.

In accordance with long-sanctioned usage, the duplicate specimens in the Museum are made up into sets and distributed to schools and museums, accurately named, and of great service, both for museum and class-room use.

The reports of the Smithsonian Institution will show how many hundred thousands of objects have been thus distributed during the past twenty years. Every museum in the United States has profited in this way, and by its system of exchange the Museum has, while enriching itself, contributed largely to the stores of every important scientific museum in the world.

Not only are specimens thus sent out, but aid is rendered in other ways. Within the last year not less than forty local museums in the United States were supplied with working plans of cases in use in the Museum, and similar sets of plans have been supplied within the past few years to national museums in other countries.

Not only do the people of the country at large profit by the work of the Smithsonian, as made available to local institutions, but they profit directly, and personally to a very considerable extent.

The curator of each department in the Museum is expected to be an authority in his own line of work, and the knowledge of the whole staff of experts is thus placed without cost at the service of every citizen.

B.—ORGANIZATION AND SCOPE OF THE MUSEUM.

The National Museum is under the direction of the Smithsonian Institution, which is governed by an establishment consisting of the President of the United States and his Cabinet, the Commissioner of Patents, and the Board of Regents, which latter is composed of the Vice-President, Chief-Justice of the United States, three members of the Senate, three members of the House of Representatives, and six other citizens not members of Congress, two of whom are residents of the city of Washington.

The Secretary of the Smithsonian Institution, to whom is intrusted the actual management of its affairs, is by law the "keeper of the collections." The staff at the present time is composed of the Assistant Secretary of the Smithsonian Institution in charge of the National Museum, and twenty-seven curators and acting curators, seventeen of whom receive no salary from the Museum appropriation. There are also twelve administrative departments.

The collections of the Museum are made up, in large part, of the following materials:

1. The natural history and anthropological collections, accumulated since 1850 by the efforts of the officers and correspondents of the Smithsonian Institution.

2. The collections of the Wilkes exploring expedition, the Perry expedition to Japan, and other naval expeditions.

3. The collections of the scientific officers of the Pacific Railroad survey, the Mexican boundary survey, and of the surveys carried on by the Engineer Corps of the Army.

4. The collections of the U. S. geological surveys under the direction of the U. S. geologists, Hayden, King, and Powell.

5. The collections of the U. S. Fish Commission.

6. The gifts by foreign Governments to the Museum or to the President or other public officers of the United States, who are fordidden by law to retain such gifts in their private posessions.

7. The collections made by the United States to illustrate the animal and mineral resources, the fisheries, and the ethnology of the native races of the country, on the occasion of the International Exhibition at Philadelphia in 1876, and the fishery collections displayed by the United States at the International Fisheries Exhibition at Berlin in 1880 and at London in 1883.

8. The collections given by the Governments of the several foreign nations, thirty in number, which participated in the exhibition at Philadelphia in 1876.

9. The industrial collections given by numerous manufacturing and commercial houses of Europe and America, at the time of the Philadelphia Exhibition and subsequently.

10. The material received, in exchange for duplicate specimens, from the museums in Europe and America, at the time of the Philadelphia Exhibition and subsequently.

In connection with the general work of administration there is in the Museum a library, a chemical laboratory, a photographic establishment, and various workshops for taxidermy, modeling, and for the preparation of skeletons for exhibition. In connection with the department of art and industry two preparators are constantly employed.

The publications of the Museum consist of (1) The Annual Report; (2) The Proceedings of the United States National Museum; (3) The Bulletin of the United States National Museum; (4) The series of circulars. These have, in part, been reprinted in the volumes of the Smithsonian Miscellaneous Collections.

C.—SPECIAL TOPICS OF THE YEAR.

THE CINCINNATI EXHIBITION.

By act of Congress, approved May 28, 1888,* the Smithsonian Institution was directed to participate in the Centennial Exposition of the Ohio Valley and Central States, and the latter months of the fiscal year have been devoted by the curators to the preparation of special exhibits. The fourth of July has been announced as the date of opening the exhibition. Very little time, therefore, remains for the completion of this work.

THE PROPOSED STATUE TO PROFESSOR BAIRD.

On December 12, 1887, a bill† was introduced into the Senate by Senator Morrill, appropriating $15,000 for the erection of a bronze statue of Professor Baird, the late Secretary of the Smithsonian Institution. This bill passed the Senate on February 9, but failed to come up for action in the House of Representatives.

THE CAPRON COLLECTION.

For a number of years the collection of lacquers, bronzes, carved ivories, coins, and other works of art, obtained in Japan by the late General Horace Capron, has been deposited in the National Museum. It is the property of his heirs, who are desirous of selling it to the Government. On December 21, 1887, a bill‡ providing for its purchase was introduced into the Senate by Hon. Daniel Voorhees, of Indiana. This bill was favorably acted upon in the Senate, but did not come to a vote in the House of Representatives.

INCREASING GROWTH OF THE COLLECTIONS.

During the last three years (since the adoption of the standard of the fiscal year by the Smithsonian Institution) the number of accession "lots" received has been 4,623, including nearly five hundred and twenty thousand specimens. The last accession number in June, 1888, was 20831.

REARRANGEMEMENT OF THE EXHIBITION HALLS.

The appearance of the exhibition halls has been, it is thought, very much improved during the year. Some new methods of installation have been successfully inaugurated in some of the departments. Several new forms of cases have also been adopted. The co-operation of the

* Fiftieth Congress, first session. House resolution No. 127, "to establish a centennial exposition of the Ohio Valley and Central States." Introduced by Hon. Benjamin Butterworth, of Ohio, on March 5, 1888; passed the Senate and House of Representatives May 17, and became a public law on May 28, 1888. The sum of $50,000 was appropriated in this bill, to enable the Smithsonian Institution, U. S. National Museum, and the U. S. Fish Commission to prepare and send exhibits.

† Senate bill 140.

‡ Senate bill No. 1033.

Johns Hopkins University has been secured in the formation of a collection of Oriental Antiquities. Other new sections have been organized.

TRANSFER OF DISBURSEMENTS FROM THE DEPARTMENT OF THE INTERIOR.

The rapid growth of the Museum for several years past has shown it to be desirable that the direct administration of the Museum appropriations should be transferred from the Department of the Interior to the hands of the Smithsonian Institution, the legal custodian of the Museum and its collections. This matter was fully discussed at the last annual meeting of the Board of Regents, and a conference between the Chancellor of the Smithsonian Institution, the Secretary of the Interior, and the Secretary of the Smithsonian Institution was held on February 13. Some correspondence followed between the Secretary of the Interior and the Secretary of the Smithsonian Institution, in which the former consented to the proposed transfer. This correspondence is published in the report of the Secretary of the Smithsonian Institution to the Board of Regents for this year. *

A letter was then addressed to the chairman of the House Committee on Appropriations,* setting forth the facts in the case, and the changes proposed. These were indicated in the sundry civil bill, and, if approved by Congress, the disbursement of money appropriated for the National Museum will hereafter be made by an officer designated by the Secretary of the Smithsonian Institution.

THE COLLECTION OF LIVING ANIMALS.

Early in the year preparations were made for the establishment of a department of living animals in the Museum, in order to afford to the taxidermists an opportunity of observing the habits and positions of the various species, with a view to using the knowledge thus acquired in the mounting of skins for the exhibition series of mammals. Active work in this department commenced in October. Mr. Willliam T. Hornaday was appointed curator.

The U. S. Fish Commission kindly tendered the use of one of its special cars then about to be sent to the far west, for the transportation of living animals to Washington, and Mr. Hornaday visited several of the northwestern States and Territories. The expedition was very successful, and a large number of deer, bears, foxes, lynxes, eagles, and other animals were obtained as a nucleus for the collection.

D.—THE CONDITION OF THE COLLECTIONS.

INCREASE OF THE COLLECTIONS.

Since the erection of the present Museum building in 1881 there have been more than 12,000 accessions to the collections, chiefly by gift. From 1859 to 1880 the accessions numbered 8,475. It is thus evident

* Pages 8-11.

* Page 8, ibid.

that during the last eight years the number of accessions has been half as large again as during the previous twenty-one years. Many of the more recent ones are of very great extent. Among these may be mentioned the bequest of the late Isaac Lea, of Philadelphia, which contains 20,000 specimens of shells, besides minerals and other objects; the Jeffreys 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.

There are also the extensive collections obtained at the Fisheries Exhibitions at Berlin and London and at the close of the New Orleans Cotton Centennial; the Shepard collection of meteorites; the Wilson collection of archæological objects (more than 12,000 specimens); the Lorillard collection of Central American antiquities, and very many others nearly as extensive. In addition to these are the annual accretions from the work of the U. S. Fish Commission, the U. S. Geological Survey, and the Bureau of Ethnology, as well as the contributions from several expeditions of the Government, from Army and Navy officers, and from other Government officials. These have been very extensive, and are yearly increasing in bulk and value.

The accessions during the year are 1,481 in number (19351–20831). These consist, in the aggregate, of more than 137,000 specimens. A table showing approximately the number of specimens in the Museum in 1882 and received each year since is given in the next paragraph, devoted to the census of the collections.

CENSUS OF THE COLLECTIONS.

One of the most striking features in connection with the affairs of the Museum is the remarkable increase in the extent of its collections. This increase is in a large degree spontaneous, only a very small sum of money being available for the purchase of new material. As might be supposed, a considerable proportion of the objects given duplicate material already on hand, and although these contributions can with the utmost advantage be used for distribution to other museums and schools, they do not increase, as much as is desired, the value of the collections for study by specialists and for general educational purposes. The need of a larger fund for the purchase of specimens is yearly more manifest. Exceedingly important material is constantly offered to us at prices very much below what it would cost to obtain it by collecting, and, in many instances, when refused, it is eagerly taken by the museums and institutions of Europe. The extent and character of the recent additions to the collections may, perhaps, be better shown by the appended table than in any other way. This table shows comparatively the results of a census of the collections taken annually for the past six years, and from it it appears that the number of specimens, or of lots of

specimens, on hand at the close of the year is more than 2,800,000. These figures are in many instances estimated, and are always subject to revision.

Approximate number of specimens in the Museum in 1882 *and received each year since.*

Name of Department.	1882.	1883.	1884.	[1]1885.	1885–'86.	1886–'87.	1887–'88.
Arts and industries:							
Materia medica	.....	4,000	4,442	.....	4,850	5,516	5,762
Foods	.....	[2]1,244	1,580	.....	[3]822	[4]877	[5]877
Textiles	.....	.....	2,000	.....	3,064	3,144	[5]3,144
Fisheries	.....	.....	5,000	.....	[3]9,870	10,078	[5]10,078
Animal products	.....	.....	1,000	.....	2,792	2,822	[5]2,822
Naval architecture	.....	.....	600	.....	.....	.....	.....
Historical relics	.....	.....	.....	.....	1,092	} 13,634	14,640
Coins, medals, paper money, etc.	.....	.....	.....	.....	1,055		
Musical instruments	.....	.....	.....	.....	400	417	427
Modern pottery, porcelain, and bronzes	.....	.....	.....	.....	2,278	2,238	3,011
Paints and dyes	.....	.....	.....	.....	[3]77	100	[5]100
"The Catlin Gallery"	.....	.....	.....	.....	500	500	[5]500
Physical apparatus	.....	.....	.....	.....	250	251	[5]251
Oils and gums	.....	.....	.....	.....	[3]197	198	[5]198
Chemical products	.....	.....	.....	.....	[3]659	661	[5]661
Ethnology	.....	.....	200,000	.....	[6]500,000	503,764	505,464
American aboriginal pottery	.....	.....	12,000	.....	25,000	[6]26,022	[6]27,122
Prehistoric anthropology	35,512	40,491	45,252	.....	65,314	101,659	108,631
Mammals (skins and alcoholics)	4,660	4,920	5,694	.....	7,451	7,811	8,058
Birds	44,354	47,246	50,350	.....	55,945	54,987	56,484
Bird's eggs	.....	.....	40,072	.....	44,163	[7]48,173	50,055
Reptiles and batrachians	.....	.....	23,495	.....	25,344	27,542	27,664
Fishes	50,000	65,000	68,000	.....	75,000	100,000	101,350
Mollusks	[8]33,375	.....	400,000	.....	[9]460,000	425,000	455,000
Insects	1,000	.....	[10]151,000	.....	[6]500,000	[6]585,000	595,000
Marine invertebrates	[8]11,781	[8]14,825	[6]200,000	.....	[6]350,000	[9]450,000	515,000
Comparative anatomy:							
Osteology	3,535	3,640	4,214	} ...	10,210	[6]11,022	11,558
Anatomy	70	103	3,000				
Palæozoic fossils	.....	20,000	73,000	.....	80,482	84,491	84,649
Mesozoic fossils	.....	.....	100,000	.....	69,742	70,775	70,925
Cenozoic fossils	(Included with mollusks.)			.....	.....	.....	.....
Fossil plants	.....	4,624	[11]7,291	.....	[12]7,429	8,462	10,000
Recent plants	.....	.....	.....	.....	30,000	[6]32,000	[6]38,000
Minerals	.....	14,550	16,610	.....	18,401	18,601	21,896
Lithology and physical geology	[13]9,075	12,500	18,000	.....	20,647	[6]21,500	22,500
Metallurgy and economic geology	.....	30,000	40,000	.....	48,000	[6]49,000	51,412
Living animals	.....	.....	.....	.....	.....	.....	220
Total	193,362	263,143	1,472,600	.....	2,420,944	2,666,335	2,803,459

[1] No census of collection taken.
[2] Including paints, pigments, and oils.
[3] Duplicates not included.
[4] Foods only.
[5] No entries of material received during the year have been made on the catalogue.
[6] Estimated.
[7] 2,235 are nests.
[8] Catalogue entries.
[9] Including Cenozoic fossils.
[10] Professor Riley's collection numbers 15,000 specimens.
[11] Fossil and recent.
[12] Exclusive of Professor Ward's collection.
[13] In reserve series.

It will be seen from this table that the number of specimens at the close of 1882 was approximately 193,362, and that this total has been increased during the next five and a half years to nearly 3,000,000. In other words, for twenty-two years (1859–1881) the average number of specimens received annually was less than 8,800; while during the last five years and a half the average number of specimens received annually has been nearly 475,000.

CATALOGUE ENTRIES.

The cataloguing of specimens is attended to by the curators of the several departments in the Museum. Each department has its book or set of books for this purpose, and until the catalogue entry has been made, the routine of recording the receipt of specimens is not complete. A catalogue entry may relate to a single specimen or to a large number of specimens, as, for instance, frequently happens in connection with marine invertebrates, insects, fossils, and other groups of objects. The number of catalogue entries during the year is, therefore, no indication of the total number of specimens added to the Museum collections.

As shown in the following table, the total number of catalogue entries for the year covered by this report is 26,891, while the total number of specimens received is estimated at more than 137,000.

Table showing the number of catalogue entries made during the year.

Name of department.	Total No. of entries.
Arts and industries:	
Materia medica	246
Textiles	21
Animal products	26
Fisheries	445
Historical relics, coins, badges, etc	552
Ethnology	790
American aboriginal pottery	1,542
Prehistoric anthropology	2,696
Mammals	337
Birds	2,206
Birds' eggs	487
Reptiles and batrachians	83
Fishes	450
Vertebrate fossils	22
Mollusks (including Cenozoic fossils)	11,799
Insects	56
Marine invertebrates (exclusive of mollusks)	1,021
Comparative anatomy	536
Invertebrate fossils:	
Paleozoic	350
Mesozoic	30
Fossil plants	19
Recent plants	45
Minerals	347
Lithology and physical geology	1,203
Metallurgy and economic geology	1,413
Living animals	169
Total	26,891

INSTALLATION OF COLLECTIONS AND ASSIGNMENT OF SPACE.

Several attractive additions to the exhibition series in the Museum have been made during the past year, and the general appearance of the exhibition halls is now very satisfactory. An interesting contribution, consisting of a series of India proofs, from the Bureau of Engraving and Printing, has been received. On these are exhibited the backs and faces of all the current bonds and currency notes issued by the United States, illustrating each denomination of Treasury notes, gold and silver certificates, from $1 to $10,000, and coupon and registered bonds from $10 to $50,000. To the collection of historical relics has been added an object of rare interest. This is one of the thirteen pamphlets signed by George Washington, John Adams, and colonial delegates, entitled "Original Association of Congress, October 20, 1774". By this association the delegates pledged the colonies not to import British merchandise after December 1, 1774. The pamphlet consists of nine printed pages, more than two of which are devoted to the autograph signatures of the delegates. During the year the Smithsonian Institution has placed in the Museum its collection of portraits of scientific and literary men and other prominent personages. This series includes nearly 2,500 photographs, and is exceedingly valuable as a nucleus for a national gallery of portraits of representative men. The entire collection of materia medica has during the year been removed from the west north range of the Museum to the east-south range, and this transfer has made necessary a rearrangement of the collection. As mentioned in the report of Mr. True, curator of mammals, the idea of representing the more important mammals of North America by groups, accompanied by accessories indicative of the habits and natural surroundings of the species, which had been for some time under consideration, has been partly carried into execution, five groups having been placed in the exhibition hall, one of which, a group of bisons, is undoubtedly the finest work of its kind in the world. Work has been continued in the installation of the ethnological collection in the east and west halls. It has been impossible to make very rapid progress in the systematic rearrangement of the exhibition series of birds, but a satisfactory beginning in that direction has been made. The removal of the collection of reptiles and fishes from the west end of the Smithsonian Institution has been necessitated, in order that that portion of the building might be made fire-proof. This work having been completed, much time was spent in replacing these collections. An exhibition series of fishes has been installed in the west hall of the Smithsonian building. The collection of reptiles is still without exhibition space. The mollusk collection in the Museum is now in some respects, superior to any in the world. Important additions are constantly being made to it, and the work of installing an exhibition series of specimens is progressing steadily. The Department of Insects has placed on ex-

hibition a series of Coleoptera. Numerous additions to the exhibition series of osteological material have been made. The mineralogical collection has steadily increased, and additions have been made to the exhibition series of meteorites and to the gem collection. The cases containing the exhibition material of this department are very attractive and excite much interest on the part of visitors. More than two months were spent by the curator of lithology and his assistants in rearranging the exhibition material belonging to the department. The arrangement decided upon was such that the moving of nearly every specimen in the hall was made necessary. Since this rearrangement many important additions to the series have been made. A change in the space occupied by the Department of Metallurgy was made early in the year, the whole of the southwest court being assigned to the department, and the time and energy of the curator and his assistants, during the greater part of the year, have been devoted to the work of rearranging the exhibition material.

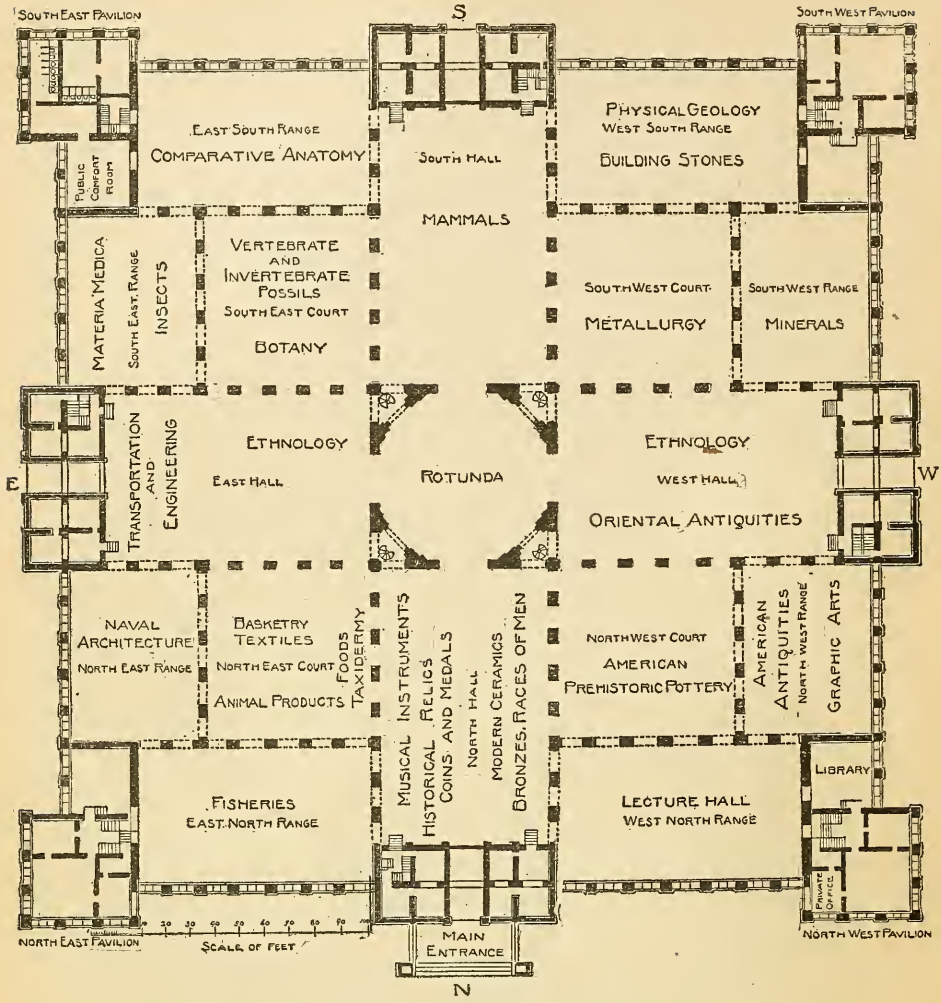
The Department of Living Animals, recently organized, has created wide interest. Many interesting specimens have already been obtained. The most important of these is a pair of buffaloes, presented by Hon. E. G. Blackford, of New York City.

Several important changes have been made in the assignment of space in the exhibition halls. The collection of modern ceramics and several special collections, such as the Capron collection of Japanese objects and the Hippisley collection of Chinese porcelains, have been placed on the west side of the north hall. A wall case, extending along the entire west side of the north hall, is devoted to collections representing the races of men and their domestic life. The scope of the collection belonging to the section of steam transportation has been enlarged to include transportation generally, and also to embrace the subject of engineering. The space assigned to these collections is the eastern end of the east hall.

The collections of prehistoric anthropology, of marine invertebrates, of fishes, of mollusks, and of reptiles are still retained in the Smithsonian building.

The north end of the west hall, from which the collection of modern pottery has been removed, is devoted to the section of Oriental Antiquities. The collection of metallurgy, including that portion of it which occupies the west end of the west hall, has been removed to the southwest court, the collection of minerals having been transferred to the southwest range in lieu of the metallurgical collection. In the southeast court, space has been assigned to the vertebrate and invertebrate fossil collections and to the Department of Botany.

The present assignments are shown in the accompanying plan:



E.—THE MUSEUM STAFF.

The staff of the Museum includes two classes—scientific and administrative—the former consisting of curators, honorary curators, acting curators, assistant curators, assistants and aids; the latter including the financial and clerical force, and the superintendent of buildings with the watchmen, mechanics, and laborers under his supervision.

THE SCIENTIFIC STAFF.

There are now in the Museum thirty-one organized departments and sections under the care of twenty-seven curators and assistant curators. Of these custodians, ten receive salaries from the Museum appropriations. Of the remaining seventeen, four are detailed from the U. S. Fish Commission, two from the U. S. Army, one from the U. S. Navy,

five from the U. S. Geological Survey, and one from the Bureau of Ethnology.

Dr. Charles Rau, for many years in charge of the archæological collection in the Museum, died on June 25, 1887. He was in 1881 appointed curator of the Department of Antiquities in the National Museum. His health gave way in 1886, and in July, 1887, he went to the hospital of the University of Pennsylvania, where he died. His body was brought to Washington, and was buried in Oak Hill Cemetery. Dr. Rau has been succeeded by Mr. Thomas Wilson, who recived his appointment as honorary curator on December 1. In November Dr. H. G. Beyer, U. S. Navy, honorary curator of the Section of Materia Medica, was ordered to other duties, and Dr. James M. Flint, the first curator of this collection, has again taken charge. The Museum has commenced the formation of a collection of casts of Assyrian and Babylonian antiquities in association with the Johns Hopkins University. Dr. Paul Haupt, professor of Semitic languages in the Johns Hopkins University, was in February appointed honorary curator, Dr. Cyrus Adler, of the same university, consenting to act as honorary assistant curator. The Section of Transportation, under the care of Mr. J. E. Watkins, has now reached that point in its history where it may take rank with the other sections of the Department of Arts and Industries. On May 9 the Department of Living Animals was organized, with Mr. W. T. Hornaday, chief taxidermist, as curator. On June 8 Charles Wickliffe Beckham, formerly an assistant in the Department of Birds, died. He made several valuable contributions to American ornithological literature.

In other respects the personnel of the scientific departments in the Museum remains the same as in 1887, as shown in the following classified list:

I. Arts and Industries, the Assistant Secretary acting as curator, with adjunct curatorships as follows:
- Animal Products: R. Edward Earll, U. S. Fish Commission, acting curator.*
- Foods: W. O. Atwater, curator.*
- Fisheries: R. Edward Earll, acting curator.*
- Materia Medica: James M. Flint, M. D., U. S. Navy, curator.*
- Textile Industries: Romyn Hitchcock, acting curator.†
- Historical Relics: A. Howard Clark, assistant curator.
- Transportation and Engineering: J. Elfreth Watkins, curator.
- Graphic Arts: S. R. Koehler, acting curator.
- Naval Architecture: J. W. Collins, U. S. Fish Commission, curator.*

II. Ethnology: Otis T. Mason, curator; Walter Hough, aid.
- American Aboriginal Pottery: W. H. Holmes, Bureau of Ethnology, curator.*
- Oriental Antiquities: Paul Haupt, curator;* Cyrus Adler, assistant curator.

III. Prehistoric Anthropology: Thomas Wilson.

IV. Mammals: F. W. True, curator; W. G. Stimpson, aid.

---

* Honorary. † Absent in Japan.

V. Birds: Robert Ridgway, curator; Leonard Stejneger, assistant curator.
Bird's Eggs: Charles E. Bendire, U. S. Army, curator.*
VI. Reptiles and Batrachians: H. C. Yarrow, M. D., curator.*
VII. Fishes: Tarleton H. Bean, curator;* Barton A. Bean, aid.
VIII. Vertebrate Fossils: O. C. Marsh, U. S. Geological Survey, curator.*
IX. Mollusks: W. H. Dall, U. S. Geological Survey, curator;* R. E. C. Stearns, adjunct curator.
X. Insects: C. V. Riley, Department of Agriculture, curator;* J. B. Smith, assistant curator.
XI. Marine Invertebrates: Richard Rathbun, U. S. Fish Commission, curator.*
XII. Comparative Anatomy: F. W. True, acting curator; F. A. Lucas, assistant curator.
XIII. Invertebrate Fossils:
Paleozoic: C. D. Walcott, U. S. Geological Survey, curator.*
Mesozoic: C. A. White, U. S. Geological Survey, curator.*
Cenozoic: W. H. Dall, U. S. Geological Survey, curator.*
XIV. Fossil Plants: Lester F. Ward, U. S. Geological Survey, curator;* F. H. Knowlton, assistant curator.
XV. Recent Plants: Lester F. Ward, U. S. Geological Survey, curator;* F. H. Knowlton, assistant curator.
XVI. Minerals: F. W. Clarke, U. S. Geological Survey, curator;* William S. Yeates, assistant curator.
XVII. Lithology and Physical Geology: George P. Merrill, curator.
XVIII. Metallurgy and Economic Geology: Fred. P. Dewey, curator.
XIX. Living Animals: William T. Hornaday, curator.

THE ADMINISTRATIVE STAFF.

There have been no important changes in the administrative corps during the year.

Mr. W. V. Cox, chief clerk, acted as representative of the Smithsonian Institution at the Minneapolis Industrial Exposition.

F.—REVIEW OF WORK IN THE SCIENTIFIC DEPARTMENTS.

The energies of several of the curators have been devoted during the greater part of the year to the preparation of exhibits for the Cincinnati Exposition. A report upon the participation of the Smithsonian Institution in this exposition, including statements in regard to the several exhibits, will be published in the report for 1889. This work has seriously interfered with the regular Museum duties of the curators, and has consequently diminished the amount of original research in the scientific departments of the Museum. It is a matter of regret that so few of the special collections in the Department of Arts and Industries have been formally reported upon this year. In many cases the curators of these collections are performing this work in an honorary capacity, and are compelled to devote the greater part of their time to the accomplishment of work connected with their official duties. Following the custom adopted in previous reports, I have briefly reviewed the work of each department separately.

* Honorary.

ARTS AND INDUSTRIES.

The organization of a new section of this department has been arranged. Dr. Paul Haupt, of Johns Hopkins University, Baltimore, has been appointed honorary curator of the collection of Oriental Antiquities, with Dr. Cyrus Adler, of the same university, as honorary assistant curator.

In connection with this arrangement the following circular, which has been approved by the Secretary of the Smithsonian Institution, has been published by the Johns Hopkins University:

Memorandum of the understanding between the National Museum and the Johns Hopkins University.

The National Museum at Washington has undertaken the formations of study collections of casts of Assyrian and Babylonian antiquities in association with the Johns Hopkins University of Baltimore. The two institutions will co-operate for this purpose, upon the following basis:

1st. The Museum stands ready to make fac-similes and casts of Assyrian and Babylonian antiquities.

2d. The attempt will first be made to obtain copies of the Assyrian antiquities preserved in this country.

3d. For the present the Museum will confine itself to the reproduction, in fac-simile and flat casts, of Assyrian and Babylonian seal cylinders.

4th. The Johns Hopkins University will attend to the proper arrangement and cataloguing of the Assyrian collection in the National Museum, under the supervision of Dr. Haupt, professor of Semitic languages, and Dr. Adler, assistant in the Semitic courses, who will also co-operate in the work of forming the collection and securing the loan of objects to be copied.

5th. Three sets of fac-similes and casts will be made in each case: the first to be preserved in the National Museum at Washington; the second to be transferred to the Semitic library of Johns Hopkins University, at Baltimore; and the third to be presented to the owners of the objects loaned.

Numerous and valuable additions have been made to the collection of graphic arts, under the energetic curatorship of Mr. S. R. Koehler. An interesting exhibit of illustrations of engraving, etching, and of the photo-mechanical processes, has been prepared by Mr. Koehler for the Cincinnati Exposition. A catalogue of this collection has been published in the appendix to the tenth volume of the Proceedings U. S. National Museum.* After the close of the Exposition the collection will be permanently installed in the National Museum.

The collection of Materia Medica is now under the care of the former honorary curator, Dr. James M. Flint, U. S. Navy, Dr. H. G. Beyer, U. S. Navy, having been ordered to other duty by the Navy Department. A collection of Corean drugs has been purchased, and is of much importance in completing the series of drugs from that country. The entire collection is now installed in the east-south range. During the year 246 specimens have been added to the collection.

The collection of historical and personal relics, under the care of Mr. A. H. Clark, has received some interesting additions, among which is the war saddle of General Grant, deposited by General A. H. Markland. From Mr. Stephen Vail has been received a piece of the original wire over

*Pp. 701–731.

which a message was sent in 1840 during the experiments of Professor Morse.

The War Department has transferred to the National Museum several interesting relics, including a large section of an oak tree riddled with bullets from the battle-field at Appomattox Court-House. The original plaster model of the bronze statue of George Washington, designed by William Rudolf O'Donovan, has been received. A pair of silver-mounted flint-lock pistols, once the property of General Lafayette, has been deposited by Mr. William Burnett. The Smithsonian Institution has transferred to the Museum its collection of portraits of American and foreign men of science and of persons prominent in political and civil life. The Museum had already accumulated engraved and photographic portraits, and plans are now being arranged for the formation of a comprehensive collection, in which especial attention will be given to the representative men of America.

The collection of coins, medals, and paper money has been gradually increased. A series of proofs of all the current bonds and currency notes issued by the United States, and of gold and silver certificates, coupons, and registered bonds, has, through the courtesy of Hon. E. O. Graves, been presented by the Bureau of Engraving and Printing.

During the year, 1,006 specimens have been added to the collection, and 552 entries have been made in the catalogue.

ETHNOLOGY.

Prof. Otis T. Mason, curator, has pushed forward work in connection with the ethnological series, the object of which is to show representatives of all the races of men. The arrangement of the Eskimo collection, which was commenced last year by Lieut. T. Dix Bolles, U. S. Navy, has been completed. The curator is arranging for comparison the bows and arrows from all parts of the world, with a view to preparing an extensive monograph upon the subject. Prof. G. Stanley Hall investigated the subject of mythology from the psycho-physical point of view, and was accorded the use of the ethnological collections of the Museum. An exceedingly valuable collection of objects from Easter Island has been placed in the Museum by Paymaster W. J. Thomson, U. S. Navy.

It is the intention of the curator to prepare each year for publication in the Museum report one or more papers relating to special collections illustrating the arts and industries of the North American Indians. In the report for 1884, two papers were published, on Throwing-sticks and on Basket-work of the North American Aborigines. In the report for 1887 were two papers by Professor Mason on Cradles of the American Aborigines and the Human Beast of Burden.

During the year, 1,700 specimens have been added to the collection, and 790 entries have been made in the catalogue.

AMERICAN ABORIGINAL POTTERY.

Mr. W. H. Holmes, honorary curator, has made a study of the origin and significance of the textile ornament upon the pottery of the eastern United States, and of the relation between the ancient and recent ceramic remains of northern New Mexico. The work of cataloguing and installing the immense collection of prehistoric pottery has practically been completed. Four collections of considerable importance have been received during the year: from Col. James Stevenson, of the Bureau of Ethnology, from Mr. James Mooney, from Mr. J. A. McNiel, and from Rev. Ward Batchelor, respectively.

During the year 1,100 specimens have been added to the collection, and 1,541 entries have been made in the catalogue, including the recording of collections which had been previously received.

PREHISTORIC ANTHROPOLOGY.

The curatorship of this department became vacant in July by the death of Dr. Charles Rau, and on December 1, 1887, Mr. Thomas Wilson was appointed curator. Mr. Wilson had been consul of the United States in Belgium and France, and had profited by his opportunities for the study of prehistoric anthropology in the localities in those countries which had become renowned for their bearings upon this science. He had while there made a collection of objects connected with prehistoric anthropology in Europe, amounting in number to 10,288 specimens, which he has deposited in the National Museum, and of which mention is made in the last annual report.

Dr. Rau bequeathed to the library 715 bound volumes and 1,722 unbound books and pamphlets. He also gave 89 modern Indian objects, 474 of European prehistoric objects, and 1,367 American prehistoric objects, to the ethnographical and archæological collections in the Museum.

The special work of the curator during the year has consisted in gathering information concerning the existence and geographic distribution of paleolithic implements in the United States, it being the curator's desire to assist in the solution of the problem relating to the existence of man on the American continent, especially in the United States, during the paleolithic period of the stone age. In this connection a circular (No. 36) was prepared by the Smithsonian Institution for distribution among persons interested in archæological matters. Several hundred replies were received. From these has been compiled a paper, including a discussion of the correspondence upon this subject and of deductions made therefrom, which is published in Section III of this Report.

During the year 6,972 specimens have been added to the collection, and 2,696 entries have been made in the catalogue.

MAMMALS.

The chief feature of the year's work in the Department of Mammals has been the rearrangement of the exhibition series in new cases, and considerable progress has been made. Mr. True, curator, reports that there has been received a smaller number of donations than in previous years, but that some excellent material has been obtained by purchase and exchange. A valuable series of deer-skins from Honduras was collected by Mr. Charles H. Townsend. A fine male Harnessed Antelope was presented by the Zoological Society of Philadelphia. Nearly sixty specimens have been mounted by the taxidermists.

During the year 247 specimens (skins and alcoholics) have been added to the collection, and 337 entries have been made in the catalogue.

BIRDS.

Mr. Robert Ridgway, curator, has prepared a review of the Mexican and Central American members of six families. Collections of birds from the Lower Amazon and from islands in the Caribbean Sea and on the coast of Honduras have been determined. The curator has written a monograph of the genera *Dendrocincla* and *Psittacula*.

Dr. Leonhard Stejneger, assistant curator, has continued his studies of the Japanese collection of birds belonging to the Museum, and has investigated several groups of European birds. He has also reported upon two collections of birds from the Hawaiian Islands.

For more than two months the time of the curator and his assistants was devoted to the preparation of an exhibit for the Cincinnati Exposition.

Both the exhibition and study series of this department have steadily improved during the year, and progress is being rapidly made in the systematic arrangement and classification of the immense amount of material which has been received both during this and previous years.

The curator of birds has called special attention to the fact that several species of North American birds are fast becoming extinct, and has emphasized the desirability of obtaining additional specimens of these species before it is too late. These species are: Great Auk, *Plautus impinnis;* Labrador Duck, *Camptolaimus labradorius;* Heath Hen, *Tympanuchus cupido;* Passenger Pigeon, *Ectopistes migratorius;* California Vulture, *Pseudogryphus californianus;* Carolina Paroquet, *Conurus carolinensis;* and Ivory-billed Woodpecker, *Campephilus principalis.*

The first of these, the Great Auk, is now believed to be entirely extinct.

No specimens of the Labrador Duck have been taken since April, 1871. Formerly specimens were occasionally taken about Grand Manan Island, near Eastport, Maine.

Until within the last two or three years specimens of the Heath Hen were occasionally found on Martha's Vineyard and on the island of

Naushon. Mr. William Brewster thinks that its extinction is due to the numerous foxes found on those islands.

The Passenger Pigeon is still found in small numbers, but it is thought that it will not be many years before this species will be entirely extinct.

The California Vulture is becoming rarer each year. Large numbers of these birds have been destroyed by eating poisoned meat intended for other animals.

The Carolina Paroquet is being rapidly destroyed for its plumage, and few specimens are now left. Whole flocks can be killed easily, since, when one has been wounded, the remainder will stay by it and can not be frightened away.

The Ivory-billed Woodpecker is rapidly diminishing in numbers. No special reason has been assigned for its decrease.

Capt. Charles E. Bendire, curator of birds' eggs, has added to the above list the name of Pallas's Cormorant, *Phalacrocorax perspicillatus*. This species became extinct about thirty-five years ago on the Commander Islands. It is especially desirable to retain specimens of this bird, since only three skins have been preserved. It is believed that no skeleton or egg of this bird exists in any collection. This is a very fine bird, the largest of its family, and is provided with a lustrous plumage of burnished green and purple.

In June, 1888, the Museum lost by death the services of Charles Wickliffe Beckham. During his brief connection with the Museum Mr. Beckham proved himself to be an intelligent and valuable assistant.

During the year 1,497 specimens have been added to the collection, and 2,206 entries have been made in the catalogue.

BIRDS' EGGS.

Capt. Charles E. Bendire, U. S. Army, honorary curator, has continued the work of measuring, numbering, and rearranging the collection, and 1,778 specimens have been thus disposed of during the year. The relabeling of the reserve series, in accordance with the nomenclature adopted by the American Ornithologists' Union, has also been commenced.

The principal contributions during the year have been received from Lieut. H. C. Benson, U. S. Army, Dr. J. C. Merrill, U. S. Army, Dr. A. K. Fisher, and Dr. C. Hart Merriam, of the Department of Agriculture; Mr. F. Stephens, of San Bernardino, California, and Col. N. G. Goss, of Topeka, Kansas.

During the year 1,882 specimens have been added to the collection, and 487 entries have been made in the catalogue.

REPTILES AND BATRACHIANS.

The operations of this department have been seriously interrupted by the necessity of making some repairs in the west basement of the Smith-

sonian building. This work lasted for several months. The entire reserve series has been transferred from the laboratory of the department to store-rooms. After the repairs had been completed, the collection was again transferred to its former position. This series has, to a great extent, been relabeled and systematically arranged.

Studies upon the Batrachia in the Museum have been continued by Prof. E. D. Cope, of Philadelphia.

The curator, Dr. H. C. Yarrow, has investigated the subject of rattlesnake venom, with a view to determining its action upon animals, and numerous experiments have been made with so-called antidotes for the venom. A popular account of these experiments was published in "Forest and Stream," in May and June, 1888, and a final statement of the results of his investigations will be published in a future report of the Museum.

During the year 122 specimens have been added to the collection, and 83 entries have been made in the catalogue.

FISHES.

Dr. Tarleton H. Bean, honorary curator, was directed by the U. S. Commissioner of Fisheries to investigate the fishes of Great Egg Harbor Bay, New Jersey, and in July, 1887, left Washington for that purpose. The results of this investigation have been embodied in a paper prepared by him for publication.

Great disorder to the collection has been caused by the necessary removal of the exhibition series of fishes from the hall during the fire-proofing of the west end of the Smithsonian building. Immediately after the completion of this work the collections were returned to their places.

In 1888 Dr. Bean was ordered by the U. S. Commissioner of Fisheries to join the U. S. Fish Commission schooner *Grampus* for the purpose of investigating the southern mackerel fishery, and this cruise occupied his time during May and June, 1888.

The growth of the collection in this department during the year has been very satisfactory. Special work was accomplished on collections received from Ensign W. E. Safford, U. S. Navy, C. H. Townsend, and Señor Don José Arechavaleta. A small collection of fishes from Honduras was received from Mr. C. H. Townsend and reported upon. The collections of fishes made by the U. S. Fish Commission steamer *Albatross* and the U. S. Fish Commission schooner *Grampus* have been catalogued and preserved. Types of several new species have been obtained, and descriptions of these have been prepared for publication in the Proceedings of the National Museum. The curator states in his report that 62 accessions have been received, representing nearly every State and Territory.

During the year 1,350 specimens have been added to the collection, and 450 entries have been made in the catalogue.

MOLLUSKS.

A large portion of the time of the curator and his corps of assistants has been spent in unpacking, labeling, and repacking the large and valuable collection of mollusks bequeathed to the Smithsonian Institution by the late Dr. Isaac Lea, of Philadelphia. This collection includes about 20,000 specimens, and a description of it will be found in the report of Mr. William H. Dall, honorary curator.

Special investigations have been made in connection with the deep-sea mollusks collected by the steamers *Blake* and *Albatross* on the eastern coast of the United States and among the Antilles. A study of the fauna of the Miocene Silex beds of Tampa Bay has been made. Mr. Dall has also found time to study the relations of the members of the Tertiary mollusk fauna with the recent species of the coast.

The condition of the collection is now very satisfactory, and the curator estimates that during the year 30,000 additional specimens have been added.

Dr. R. E. C. Stearns, adjunct curator, has devoted his time to arranging, classifying, and labeling the collections, and, in addition to the routine work of the department, has prepared for publication several papers based upon museum material. A list of these papers will be found in Section IV of this report.

During the year at least 30,000 specimens have been added to the collection, and 11,799 entries (including Cenozoic fossils) have been made in the catalogue books.

INSECTS.

Considerable progress has been made in connection with the arrangement of material in the Department of Insects during the year. Owing to lack of room it has not been possible to properly expand and arrange the collections, and additional space is urgently needed. Early in the year the arrangement of Coleoptera and of the large Bombycid Lepidoptera was commenced. Studies were made of some of the genera of the Noctuidæ. The annotative and critical overhauling of the Glover plates, with the view of possibly preparing them for publication, occupied a large part of the first half of the year.

Requests sent to this department for the determination of material have been very numerous, and much time has been consumed in identifying specimens. The questions submitted as to the life habits, methods of collecting, and determination of insects, often require considerable research. Prof. C. V. Riley, honorary curator, states in his report that not less than one hundred and fifty letters, reporting names and habits of specimens sent for determination, were written during the year. The number of accessions received was not as large as last year, but their value is fully equal to that of the accessions of the previous year. The preservation of the material in this department requires great care, and much time is required to protect these specimens from museum pests.

The curator has visited Europe during the year, and consulted a number of correspondents and specialists in reference to entomological work in other museums.

Mr. J. B. Smith, assistant curator, has, in addition to performing the routine work of the department, prepared for publication a number of entomological papers, a list of which will be found in Section IV of this Report. Several important investigations have been conducted during the year by the curator, assistant curator, and co-workers of the department.

During the year about 10,000 specimens have been added to the collection, and 56 entries have been made in the catalogue.

MARINE INVERTEBRATES.

In consequence of increased duties in connection with the work of the U. S. Fish Commission, Mr. Rathbun, honorary curator of this department, has been unable to devote as much time as in previous years to museum work. The repairs which have been made in the west portion of the Smithsonian building have interfered seriously with the routine work of this department. The investigations of the curator have related chiefly to subjects bearing more or less directly on problems connected with the work of the U. S. Fish Commission. Seventeen of the thirty-three accessions received during the year were contributed by or through the medium of the U. S. Fish Commission. The current work of the department has been kept up and all the accessions of the year have been properly cared for.

A large number of duplicate sets of specimens of marine invertebrates have been distributed during the year to various schools and universities. This material has been courteously placed at the disposal of the Smithsonian Institution for this purpose by the U. S. Commissioner of Fisheries. As in former years this department has received the benefit of the co-operation of many eminent specialists, and members of the scientific staff in the service of the U. S. Fish Commission have rendered very valuable assistance in their special lines of study.

During the year about 65,000 specimens have been added to the collection, and 1,021 entries have been made in the catalogue.

COMPARATIVE ANATOMY.

No special investigations have been made in connection with the material in this department, the work of research having been necessarily subordinated to that of identifying, cataloguing, and preserving the specimens received during the year.

The total number of specimens received during the year is 536, including skulls, and skeletons of mammals, birds, reptiles, and fishes. One of the most important accessions is a series of bones of the extinct Dodo, received from Cambridge, England.

The work of labeling the exhibition series has made progress.

PALEOZOIC INVERTEBRATE FOSSILS.

The principal work of the year in the department of paleozoic fossils has been the preparation by Mr. C. D. Walcott, honorary curator, of a representative series of fossils from each of the larger divisions of the Paleozoic strata. The series, comprising 10,955 specimens, is now on exhibition, and has been provided with labels.

The curator was absent from the city seven months of the year in connection with the work of the U. S. Geological Survey. During the remainder of the year he devoted a large portion of his time to the preparation of a paper on "The Taconic System of Emmons, and the use of the name Taconic in Geologic Nomenclature."

During the year 158 specimens have been added to the collection, and 350 entries have been made in the catalogue.

MESOZOIC INVERTEBRATE FOSSILS.

Dr. C. A. White, honorary curator, states in his annual report that it has been necessary to devote the greater part of his time to the paleontological work of the U. S. Geological Survey. A great deal has been accomplished, however, in the identification of material sent for examination and in replying to letters addressed to the Museum asking for information upon paleontological subjects.

The most important accession of the year has been the Lea collection of fossils, forming a part of the extensive collections bequeathed by the late Dr. Isaac Lea to the Smithsonian Institution. A card catalogue of the collection has been made. No specimens have yet been placed upon exhibition, although a series of specimens representing the Mesozoic formation of North America is ready for exhibition as soon as cases shall have been provided. Some important papers have been published during the year by the curator. These are referred to in Section IV (Bibliography) of this Report.

During the year 150 specimens have been added to the collection, and 30 entries have been made in the catalogue.

FOSSIL AND RECENT PLANTS.

Almost the entire time of Mr. Lester F. Ward, honorary curator, has been devoted to his work as an officer of the U. S. Geological Survey. Considerable progress has been made by Prof. Leo Lesquereux, of Columbus, Ohio, in the identification of material collected in Oregon by Capt. Charles E. Bendire. Professor Lesquereux's report was edited and prepared for publication in the Proceedings of the U. S. National Museum by Mr. F. H. Knowlton, assistant curator of this department.

Mr. Knowlton continued his studies on the internal structure of fossil plants and reached some interesting results. He also made an examination of fossil wood collected in the Yellowstone National Park.

In July, 1887, the curator, accompanied by the assistant curator, left Washington on an expedition to the Yellowstone National Park, the

primary object of this expedition being to collect fossil plants in this region. About 25 species of mosses and 300 species of flowering plants were also obtained.

During the past two years a special study of the flora of the District of Columbia has been made, one of the results of which is that there are now in the herbarium about 1,000 species of plants from this locality. The curator states that several valuable accessions have been received, the principal one being the collection made by Edward Palmer, in Mexico. This contains 768 species. Second in size, but none the less valuable, is the Mexican collection made by C. G. Pringle.

The routine work of the department has been well attended to, and the present state of the collection is very satisfactory.

During the year 1,538 specimens of fossil plants have been added to the collection, and 19 entries have been made in the catalogue. There have also been received 6,000 specimens of recent plants. These have been catalogued under 347 numbers.

MINERALS.

Prof. F. W. Clarke, honorary curator, reports that gifts of minerals have been received from many sources, and that valuable additions have been made to the collections of meteorites and gems.

A collection of gems and precious stones was prepared for exhibition at the Cincinnati Exposition, and some valuable additional specimens were obtained.

The largest accession of the year is the collection bequeathed by the late Dr. Isaac Lea. The U. S. Geological Survey has, as usual, made large and valuable contributions to the collection, especially important being the minerals collected by officers of the Survey at Denver, Colorado.

The greater part of the routine work of the department has been carried on by Mr. William H. Yeates, assistant curator, who has devoted much time to cataloguing and labeling.

During the year 3,295 specimens have been added to the collection, and 347 entries have been made in the catalogue.

LITHOLOGY AND PHYSICAL GEOLOGY.

The curator, Mr. George P. Merrill, has devoted the greater part of his time to the preparation of the exhibition, study, and duplicate series. He has also completed the manuscript for a hand-book of the building-stone collection. This contains not only a catalogue of the Museum collection, but also a description of the principal quarries in the United States, information in regard to the structure and composition of rocks, methods of quarrying, results of pressure tests, and other associated subjects.

During the year the storage material belonging to this department

has been thoroughly overhauled, with a view to eliminating all worthless specimens.

The preparation of sets of duplicate material has been commenced, in order to meet the requests of educational institutions for collections of this kind.

Special researches have been made upon the Montville serpentine and the peridotite from Little Deer Island on the coast of Maine, and upon a new meteorite from California. Papers relating to these specimens have been prepared for publication in the Proceedings of the National Museum.

The curator has paid especial attention to the stratigraphic, structural, and dynamical geology exhibition series, and many important additions have been made during the year. In the annual report of this department, seventeen accessions are mentioned as of especial importance, among which are a large collection of eruptive rocks, minerals, veins, and joint formations collected by the curator in New Jersey, Rhode Island, Massachusetts, and Maine, and an interesting series of Devonian marbles and eruptive rocks sent in exchange by Mr. R. N. Worth, curator of petrology in the Plymouth Institute at Plymouth, England. Valuable contributions have also been received from officers of the U. S. Geological Survey.

During the year, 1,000 specimens have been received.

METALLURGY.

The energies of the curator, Mr. F. P. Dewey, and his assistants, have been devoted during the year to work incident to the change in the location of the exhibition space of the department. A complete reorganization of the geographical series of ores has been effected, and some changes have been made in the systematic collections in economic geology and metallurgy. The curator has prosecuted special researches in regard to the perfecting of the Hampe method of determining suboxide of copper in metallic copper, in order to carry on a further investigation upon the refining of pig-copper. He has also made a complete chemical examination of the large collection from the Lone Elm Smelting Works at Joplin, Missouri. To accomplish this it was necessary to make sixteen chemical analyses.

During the year, 101 accessions were received. Of this number, 72 consisted of specimens sent for examination and report. Two important collections were contributed by the U. S. Geological Survey. One of these was collected by Mr. J. S. Curtis in connection with the preparation of a report upon the silver-lead district of Eureka, Nevada; the other was collected by Mr. S. F. Emmons, who is preparing a report upon the geology of Leadville, Colorado.

The total number of specimens in the department is about 51,000, of which 18,000 are in the exhibition series.

During the year 2,412 specimens have been added to the collection, and 1,413 entries have been made in the catalogue.

LIVING ANIMALS.

This department was formally organized May 12, 1888, Mr. William T. Hornaday being appointed curator. For a long time past, the need of living animals had been felt to serve as models for the taxidermists, and, through the courtesy of the U. S. Fish Commission, arrangements were made for Mr. Hornaday to accompany one of the cars belonging to the Commission with a view to securing living specimens. On October 8, Mr. Hornaday left Washington, visiting points in Minnesota, Dakota, Montana, Washington Territory, Oregon, Utah, and Wyoming. This expedition resulted in the acquisition of seventeen animals. Mr. J. Frank Ellis, of the U. S. Fish Commission, and his assistant, Mr. R. S. Johnson, rendered valuable assistance to the Museum in connection with the transportation of these animals to Washington.

A wooden structure for their reception was erected immediately south of the Smithsonian Building, and on December 31, 1887, it was thrown open to the public. Since then a large number of valuable contributions have been received, among which are a fine jaguar from Mr. J. W. Riddle, of Eagle Pass, Texas, and two black bears from Mr. J. J. E. Linberg, of El Paso, Texas. The most important accession is a pair of buffaloes from Nebraska. These were purchased by Hon. E. G. Blackford, of New York, and presented to the Smithsonian Institution. The collection has been steadily increasing, and it is hoped that during the next session of Congress an appropriation will be made for the purchase of land with a view to forming a National Zoological Park. Special thanks are due to the United States Express Company for having made generous reductions in the rates of transportation on living animals, the agents of the company having been instructed to ship living specimens to this Institution at ordinary merchandise rates.

G.—REVIEW OF THE ADMINISTRATIVE WORK.

PROGRESS OF GENERAL AND INCIDENTAL WORK.

Library.

Mr. John Murdoch, librarian, has submitted the following statement in regard to the operations of the library during the year:

The total number of publications added to the library during the year was 6,063 (1,316 volumes of more than 100 pages, 1,436 pamphlets, 3,169 parts of regular serials, and 142 charts). Of these, 437 volumes, 953 pamphlets, and 1,655 parts of serials were retained for the use of the Museum from the accessions of the Smithsonian Institution.

The remainder was obtained, as usual, by gift, and, less frequently, by purchase.

The most important accession to the library during the year was the bequest of the late curator of Archæology, Dr. Charles Rau, of his archæological and general library, comprising 2,437 volumes and pamphlets, many of very great value. Of these, 408 have already been entered and catalogued.

When finished, these books will form the "Rau Memorial Library," and will be assigned to the sectional library of archæology.

Other important donations were as follows: From the estate of the late Prof. S. F. Baird, 65 volumes, 21 pamphlets, 303 parts of serials, and 3 charts; from Prof. Charles U. Shepard, of Charleston, South Carolina, 134 volumes and 5 pamphlets from the chemical library of his distinguished father. (This donation was made at the suggestion of Prof. F. W. Clarke, chief chemist, U. S. Geological Survey.) From Dr. George E. Horn, of Philadelphia, a complete set of "separates" of his entomological papers, comprising 44 pamphlets.

During the year 5,492 books were borrowed from the library and 3,023 returned. Ninety-four persons are now authorized under the regulations to draw books from the Museum Library, and of these 73 are also authorized to obtain books from the Library of Congress through the Museum Library. Two hundred and ninety-eight orders were sent to the Library of Congress during the year.

The "Ledger of Books Issued" having grown so bulky and so inconvenient, on account of the impossibility of alphabetical arrangement, it was decided to try the experiment of transferring the charges on this book to separate slips, which could be filed in alphabetical order. When these slips were prepared by the copyist they were carefully compared with the records by the librarian in person, who then canceled the old record. The slips used are of uniform size, one-fourth of the standard octavo. When a book is issued the title, with the name of the borrower and date of issue, is written on one of these slips, which are kept by themselves for the day, and counted and filed the first thing on the following morning. On the return of the book the slip is removed from the file and canceled. The receipts of each borrower are kept as before, but are filed alphabetically instead of by their dates. The experiment has proved entirely successful. It is calculated that at least half the time formerly consumed in recording loans is now saved, and there is a distinct increase in accuracy. The success of this experiment induced the librarian to use the same method in keeping the accounts with the Library of Congress, as a great deal of time was wasted whenever it was necessary to learn whether a certain book had been drawn from the Library or when one had been returned. Of the latter we had no record except the unindexed file of canceled receipts, bound in a clumsy volume. At present, one alphabetical file of slips gives the titles of all books drawn from the Library of Congress, with the date

of withdrawal of each; another shows the titles of all that have been returned with the date of withdrawal and return. These two files thus give a complete history of our dealings with the Congressional Library.

When a book is received from the Library its title is immediately written on a slip, which is stamped with the date and filed at once. On its return to the Library of Congress this slip is removed from the file of "Borrowed," stamped with the date, and filed as "Returned." This system, which has been in operation since the latter part of March, has proved entirely satisfactory.

The card-catalogue by authors has been continued, and 2,829 titles have been added to it during the year. It is still impossible to begin the much-needed catalogue of subjects.

Sectional libraries.—An inspection of the sectional libraries was begun April 2, 1888, and completed June 15, 1888. All the sectional libraries were visited by the librarian in person, and the books found in them carefully compared with the receipts given by the gentlemen in charge of the sections. At the same time the titles of all books permanently assigned to each sectional library were transferred from the ordinary "call-cards" to a special form of receipt (approved by the Secretary). These sectional library receipts are filed separately from the receipts given by curators and others for books borrowed by them personally and not for the use of the section. Thus the receipts for each sectional library form a catalogue of the books in that library. At the close of the inspection each curator was furnished with a list of the books in his sectional library.

The sectional libraries, the establishment of which has been authorized, are nineteen in number, namely: (1) Administration; (2) Archæology; (3) Assistant Secretary Smithsonian Institution; (4) Birds; (5) Chief Clerk Smithsonian Institution; (6) Editor Smithsonian Institution; (7) Ethnology; (8) Fishes; (9) Insects; (10) Lithology and Physical Geology; (11) Mammals; (12) Marine Invertebrates; (13) Materia Medica; (14) Mesozoic Fossils; (15) Metallurgy and Economic Geology; (16) Mineralogy; (17) Mollusks and Cenozoic Fossils; (18) Plants, recent and fossil; (19) Textiles and Foods.

Of these, Nos. 1, 3, and 5 have never been organized, while it has been found convenient for purposes of administration to divide the library of the section of Minerals into two divisions—(*a*) consisting chiefly of works on chemistry, and kept in the office of the honorary curator and under his immediate charge, and (*b*) containing most of the strictly mineralogical books, and kept in the mineral laboratory, in charge of the assistant curator.

The following is the result of the inspection:

Archæology.—This library was organized December 14, 1887, on the appointment of the new curator, and therefore not reinspected. On June 1, 1888, it contained 50 volumes and pamphlets and 13 parts of serials. When the Rau Memorial Library is entered and catalogued it will be assigned to this section.

Birds.—Inspected April 2, 1888; contains 462 volumes and pamphlets and 183 parts of serials. These are generally in good condition, though many of the large books are of necessity exposed to dust from lack of suitable cases. This sectional library was founded before the Museum library was organized, and was found to contain many books belonging to the Smithsonian Institution of which the librarian had no record. These were all properly catalogued and recorded.

Editor Smithsonian Institution.—Inspected June 8, 1888; contains 642 volumes and pamphlets and 390 parts of serials, all in good order.

Ethnology.—Inspected April 28, 1888; contains 61 volumes and pamphlets, 98 parts of serials, and 1 chart, in good condition.

Fishes.—Inspected April 18, 1888; contains 137 volumes and pamphlets and 12 parts of serials, in good condition, kept in suitable cases with standard Museum locks.

Insects.—Inspected June 5, 1888; contains 390 volumes and pamphlets and 343 parts of serials, in good condition, kept in a case with standard Museum lock. More case room is needed.

Lithology and physical geology.—Inspected May 3, 1888; contains 312 volumes and pamphlets and 127 parts of serials, in good condition. The curator has two cases with standard Museum locks, which hold about three-fourths of these books, while the rest are on open shelves.

Mammals.—Inspected May 28, 1888; contains 410 volumes and pamphlets, in good order. The curator has not a sufficient number of cases to contain these books.

Marine invertebrates.—Inspected April 14, 1888; contains 115 volumes and pamphlets and 118 charts, all in good condition, and kept in cases with standard Museum locks.

Materia medica.—Inspected April 23, 1888; contains 194 volumes and pamphlets and 130 parts of serials, in good condition. About half of the books are kept in a suitable case, provided with the standard Museum lock, and the rest are on open shelves.

Mesozoic fossils.—Inspected May 17, 1888; contains 36 volumes and pamphlets in good order, kept on open shelves.

Metallurgy and economic geology.—Inspected May 10, 1888; contains 349 volumes and pamphlets and 94 parts of serials, in good condition and very carefully arranged by the curator. There are six good cases, amply sufficient to hold all these books.

Mineralogy.—(*a*) Inspected June 4, 1888; contains 142 volumes and pamphlets and 228 parts of serials, in good order and kept in suitable cases. (*b*) Inspected May 16, 1888; contains 98 volumes and pamphlets in good order and kept in a suitable case, with standard Museum locks.

Mollusks and Cenozoic fossils.—Inspected April 21, 1888; contains 74 volumes and pamphlets and 34 parts of serials, in good order, kept in a locked case.

Plants, recent and fossil.—Inspected May 18, 1888; contains 320 vol-

umes and pamphlets and 339 parts of serials, kept in various rooms on the south balcony and on shelves on the balcony.

Textiles and foods.—Owing to the temporary absence of the curator and the inability of the assistant left in charge to take proper care of the books in this library, they have been recalled to the central library. On the return of the curator this sectional library will be reorganized.

It seems undesirable, and, indeed, hardly practicable to endeavor to enforce the regulation which requires that books belonging to a sectional library shall be kept separate from all other books. The books in a specialist's library are naturally arranged according to subjects, which necessarily brings together books belonging to the sectional library, the Library of Congress, and even the author himself.

Binding.—One hundred volumes belonging to the Museum were sent to the Government Bindery late in the year and were all returned on or before June 29. Considerable progress has been made in putting the pamphlets into suitable covers; but this work has been partially suspended on account of the exhaustion of the appropriation for the purchase of these covers.

Progress has also been made in arranging the pamphlets in the pamphlet boxes mentioned in my last report, but this work has necessarily been slow, since the routine work, as will be seen from the very large number of books issued, returned, and catalogued, has occupied nearly all the time of the two employés in the library.

TRANSPORTATION AND STORAGE.

DISTRIBUTION OF DUPLICATES, AND EXCHANGES.

The total number of boxes, packages, barrels, tanks, etc., received during the year was 12,400, of which 1,911 contained material for the Museum collections, the remainder of the number being distributed to their proper addresses.

The registrar, Mr. S. C. Brown, has continued to act as transportation clerk for the Smithsonian Institution, thus adding much routine work to his duties as registrar.

During the year 405 packages were entered upon the storage record of the Museum. The storing of material is of very great convenience to the curators, who may not at the time of the arrival of the material for their department be able to work up the collection at once.

The number of packages sent out was 2,042, and of this number 264 contained Museum material sent out as gifts, loans, or in exchange. Photographs of cases and exhibits in the Museum have been sent to all who made application. Much labor was added to the work of this department in connection with the shipment of exhibits to the Ohio Valley Centennial Exposition. These filled twelve cars and consisted of five hundred and ninety-six packages, weighing in the aggregate 125,000 pounds.*

*A full account of the participation of the Smithsonian Institution in this exposition will be published in the report for 1888–'89.

The following table presents the number of specimens distributed by the Museum during the year:

Department.	No. of specimens.	Department.	No. of specimens.
Textiles	30	Mollusks	481
Historical relics	20	Marine invertebrates	24,750
Ethnology	839	Invertebrate fossils	20
American prehistoric pottery	6	Fossil and recent plants	300
Prehistoric anthropology	635	Minerals	545
Mammals	119	Rocks	327
Birds	1,068	Metallurgy	6
Birds' eggs	73	Total	29,408
Reptiles	174		
Fishes	15		

The greater part of the material distributed by the Department of Marine Invertebrates was sent out in sets, in response to applications which had been received from museums and other educational institutions.

The number of specimens distributed by the Smithsonian Institution since 1854 is shown in the following table:

1854 to 1881 inclusive	435,000	1885–'86	23,937
1882	12,391	1886–'87	11,000
1883	16,270	1887–'88	29,408
1884	21,084		
1885 (January to June)	15,000	Total	564,090

A table showing approximately the number of duplicate specimens distributed to the end of 1880 has been prepared and may be of interest.

Nature of material.	Species.	Specimens.
Skeletons and skulls	588	1,945
Mammals	2,169	4,825
Birds	28,125	42,517
Reptiles	2,590	4,191
Fishes	10,903	14,639
Nests and eggs of birds	8,396	20,914
Insects	4,689	10,331
Crustaceans	1,097	2,689
Shells	90,722	197,873
Radiates	593	793
Other marine invertebrates	9,258	13,434
Plants and packages of seeds	30,496	53,030
Fossils	4,417	10,544
Minerals and rocks	10,250	21,737
Ethnological specimens	3,884	5,783
Diatomaceous earths (packages)	1,176	2,010
Total	209,353	407,255

Sixty-four photographs of cases and exhibits were sent out in compliance with requests. Fifty-three applications for duplicate specimens have been received from individuals and institutions. Many of these have been filled and the remainder will be, as soon as the duplicate material can be arranged into sets for distribution.

A large number of exchanges of material of all kinds, especially geological specimens, has been completed during the year.

The National Museum takes this opportunity of extending its warmest thanks to the Alaska Commercial Company and other companies through whose kind offices the transportation of specimens has been effected at various times during the year.

FOREIGN EXCHANGES.

Several exchanges with foreign institutions have been carried on during the year. Among the more important the following may be mentioned:

A model of the Cabin Creek meteorite was sent to M. A. Daubrée, of the Museum d'Histoire Naturelle in Paris, and other models and photographs will be sent later. To S. H. Drew, Wanganui, New Zealand, was transmitted a collection of ethnological objects, and from him was received a collection of fossils. A small collection of archæological objects, numbering fifteen specimens, was transmitted to L. Guesde, Musée L'Herminier, Point à Pître, from whom was received a collection of birdskins, numbering three hundred and twenty-eight specimens. A collection of one hundred and forty-one North American stone implements was sent in December to Sir Julius Von Haast, director of the Canterbury Museum, Christ Church, New Zealand. From Dr. E. Hamy, director of the Musée d'Ethnographie, in Paris, were received in exchange two boxes containing busts representing types of the human race. A collection of thirty-six specimens illustrating American aboriginal religion was sent to M. L de Milloué, director of the Musée Guimet at Lyons. In exchange, specimens of Roman pottery and objects of Gallo-Roman interest in bone, stone, and bronze, as well as duplicates of Chinese and Japanese religious objects, have been promised. An exchange of bats has been arranged for with Signor Angelo Senna, of the Zoölogical Institute at Pavia, Italy. A collection of minerals, ores, and rocks was received from Mr. S. Sinclair, director of the Australian Museum, Sydney, New South Wales. Birdskins, including two specimens of Namiye's Woodpecker, specimens of lacquer-work, meteoric stones, sapphire crystals, and a saddle from Loochoo, have been received from the Educational Department, Tokyo, Japan, and a collection of one hundred and seventeen birdskins has been sent in exchange.

Negotiations are still pending for exchanges of material with several other individuals and institutions.

PUBLICATIONS.

In June, 1888, the report on the operations of the National Museum for the first six months of 1885 was issued as Part II of the Annual Report of the Board of Regents of the Smithsonian Institution. This volume contains i–xi, 1–264 and i–vii, 1–939 pages, the latter series of pages constituting a paper by Hon. Thomas Donaldson, entitled "The George Catlin Indian Gallery." This is illustrated by one hundred and forty-two plates and two large maps, showing the bounds of Indian reservations.

The reports on the operations of the Museum for 1885–'86 and 1886–'87 are in type, and will soon be received from the Public Printer.

The ninth volume of "Proceedings of the U. S. National Museum," for 1886, was received from the Government Printing Office in August, 1887. Two hundred copies of this volume had already been received in "signatures" and distributed in that form to the principal scientific institutions, and also to a few individuals, in all parts of the world. The first signature was published on September 17, 1886, and the last on March 9, 1887. Volume 9 contains i–viii, 1–714 pages, and is illustrated by twenty-five full page plates, one of which is a chromo-lithograph, and a large number of text figures. The authors of papers in this volume are twenty-seven in number, namely: James E. Benedict, T. W. Blakiston, George H. Boehmer, Charles H. Bollman, E. D. Cope, W. H. Dall, George E. Doering, Charles L. Edwards, Carl H. Eigenmann, Barton W. Evermann, Fernando Ferrari-Perez, Morton W. Fordice, Charles H. Gilbert, Elizabeth G. Hughes, David S. Jordan, George N. Lawrence, John Belknap Marcou, William G. Mazyck, George P. Merrill, Richard Rathbun, Robert Ridgway, John A. Ryder, Rosa Smith, Leonhard Stejneger, John B. Smith, Frederick W. True, John Grant Wells. Nine of these are officially connected with the National Museum. The papers in this volume are sixty in number, and relate to the following subjects:

Subject.	No. of papers.	Subject.	No. of papers.
Birds	21	Naval architecture	1
Fishes	21	Materia medica	1
Mollusks	4	Invertebrate fossils	1
Mammals	4	Insects	1
Marine invertebrates	3	Lithology and physical geology	1
Reptiles	2	Total	60

Twenty-five signatures (Nos. 7–31 inclusive) of volume 10, Proceedings of the U. S. National Museum, have been published. During the months of February, March, April, May, and June, 1888, no signatures appeared.

Bulletin 32, "Catalogue of Batrachians and Reptiles of Central America and Mexico," by Prof. E. D. Cope, has been published during the year and contains 98 octavo pages. This catalogue is a systematic and synonymic description of Central American and Mexican species of Batrachia and Reptilia, largely based on material in the National Museum. To each species is added a list of the localities where it has been found, together with the name of the discoverer, or, in the absence of that, the name of the author who is responsible for the correctness of the locality. The total number of genera included in the catalogue is 197, and of species, 705, of which 135 are batrachians and 570 reptiles.

The manuscript for Bulletins No. 33, "Catalogue of Minerals and Synonyms, alphabetically arranged for the use of Museums," by Dr. Thomas Egleston, and No. 34, "Catalogue of Batrachians and Reptiles of North America," by Prof. E. D. Cope, is now in the hands of the Public Printer.

Mr. A. Howard Clark has faithfully continued his duties as editor of the Proceedings and Bulletin.

Circular No. 36 of the U. S. National Museum, concerning the Department of Prehistoric Antropology, has been issued. The object of this circular is to obtain information concerning that class of American aboriginal stone implements which have heretofore been denominated "rude or unfinished implements of the paleolithic type." It is illustrated by cuts of several stone implements. This circular was widely distributed among archæologists and others interested in the subject, and much valuable information was elicited, which has been incorporated in a paper by the curator of prehistoric anthropology, and is published in Section III of this Report.

In Section IV of the Report will be found a list of the publications of the Museum, and also a bibliography of papers published by officers of the Museum and by collaborators, whose writings are based upon Museum material. The authors of these papers are 77 in number, of whom 35 are connected with the Museum, 14 being honorary officers. The total number of papers is 396, of which 311 are by Museum officers and 85 by other investigators, and are distributed under the following subjects:

Subjects.	Papers by Museum officers.	Papers by other investigators.	Total.
Administration	4		4
Archæology	2		2
Biography	5		5
Biology	1		1
Birds	43	35	78
Birds' eggs	4		4
Chemistry	8		8

Subjects.	Papers by Museum officers.	Papers by other investigators.	Total.
Ethnology	16	3	19
Entomology	77	2	79
Fisheries and fishing grounds	47	1	48
Fishery industries	2	.....	2
Fishes	16	9	25
Foods	1	.....	1
Fossil plants	6	.....	6
General natural history	.....	2	2
Geography and exploration	5	.....	5
History	1	.....	1
Invertebrate fossils	12	.....	12
Lithology and physical geology	7	.....	7
Mammals	4	10	14
Marine invertebrates	3	5	8
Materia medica	1	.....	1
Metallurgy	2	2	4
Minerals	7	.....	7
Miscellaneous (including reviews)	23	.....	23
Mollusks	2	1	3
Osteology and craniology	3	5	8
Plants	3	1	4
Physiology	.....	4	4
Reptiles	4	4	8
Textiles	1	.....	1
Thermotics	1	1	2
Total	311	85	396

VISITORS.

During the year the total number of visitors to the Museum building has been 249,665, and to the Smithsonian Building, 102,863.

The monthly register, as kept by the door-keepers, is here recorded:

	National Museum Building.	Smithsonian Building.
1888.		
July	11,817	5,219
August	17,299	7,674
September	26,820	9,836
October	16,109	6,908
November	13,161	5,711
December	18,135	7,949
1889.		
January	18,946	7,698
February	25,603	9,773
March	30,698	10,089
April	24,822	9,822
May	33,446	14,546
June	18,809	7,638
Total	249,665	102,863
Approximate daily average	800	329

Table showing the number of visitors to the Museum and Smithsonian Buildings since the opening of the former in 1881.

Year.	Museum Building.	Smithsonian Building.	Total No. of visitors to both buildings.
1881	150,000	(?)	(?) 150,000
1882	167,455	152,744	320,199
1883	202,188	104,823	307,011
1884	195,322	91,130	286,452
1885 (January to June)	107,365	60,428	167,793
1885–'86	174,225	88,960	263,185
1886–'87	216,562	98,552	315,114
1887–'88	249,665	102,863	352,528
	1,462,782	699,500	2,162,282

LECTURES AND MEETINGS OF SOCIETIES.

Following the custom of previous years the use of the lecture hall has been granted for a series of lectures delivered under the joint auspices of the Biological and Anthropological Societies of Washington. Some of these lectures were delivered on Saturday afternoons, and others, illustrated by stereopticon views, on Friday evenings.

The course consisted of two series of lectures, the programme of each being as follows:

PROGRAMME OF THE FIRST SERIES.

February 18.—Prof. HERBERT B. ADAMS: University Extension in England, Baltimore, and Washington.

February 24.—Prof. WILLIAM LIBBY, JR.: Southeastern Alaska and its People.

March 3.—Prof. F. W. CLARKE: Chemical Analysis.

March 9.—Dr. GEORGE H. WILLIAMS: The Microscope in Geology.

March 17.—NATHANIEL H. EGLESTON: The Origin of Our Names.

March 24.—Prof. PAUL HAUPT: Excavation in Assyria and Babylonia.

PROGRAMME OF THE SECOND SERIES.

March 31.—Prof. G. STANLEY HALL: Psychic Research in England, and the Recent Study of Hypnotism in France.

April 6.—Prof. H. CARRINGTON BOLTON: Glaciers.

April 14.—Dr. DAVID T. DAY: The Use of Natural Gas.

April 21.—Prof. T. C. MENDENHALL: Earthquake Measurements.

April 28.—Prof. OTIS T. MASON: Woman's Share in Primitive Culture.

May 5.—Maj. J. W. POWELL: The Course of Human Progress.

The members of the joint committee in charge of the arrangement of the lectures were Garrick Mallery, Frank Baker, J. S. Billings, W. H. Dall, J. R. Eastman, Robert Fletcher, G. K. Gilbert, G. Brown Goode, H. W. Henshaw, J. H. Kidder, Otis T. Mason, Washington Matthews, C. Hart Merriam, C. V. Riley, and R. S. Woodward.

The following table shows the number and dates of "Saturday lectures" delivered up to the close of the last season:

Year.	Date of first and last lecture.	No. of lectures.
1882	March 11, April 29	8
1883	January 13, March 31	12
1884	January 5, April 26	17
1885	February 7, May 2	12
1886	March 6, May 8	10
1887	March 12, May 7	12
1888	February 18, May 5	12
Total		83

By permission of the Director of the Museum several societies have held their meetings in the Museum lecture hall. The following societies have availed themselves of this privilege during the year:

The National Academy of Sciences, on April 17, 18, 19, and 20.

The Botanical Section of the Biological Society of Washington, on April 4, May 3, and June 6.

The Biological Society, annual meeting, on February 1.

The Amateur Botanical Club of Washington, with the following program of special papers:

December 10, 1887.—Prof. MILES ROCK: The Guatemala Forests.

December 21.—Prof. J. W. CHICKERING: The Flora of Alaska.

January 7.—1888.—Prof. EDWARD S. BURGESS: The Fresh Water Algæ of the District.

January 21.—Dr. GEORGE VASEY: Some Important Medical Plants.

STUDENTS.

Free access has, as usual, been granted to students in the various branches of natural history. At the request of the Smithsonian Institution, and under the provision of section XIV of the act approved June 16, 1878, and section IV of article IX of the Police Regulation to kill birds within the District of Columbia for scientific purposes, permission has been given to several applicants to collect birds and bird's eggs in the District of Columbia.

Lieut. T. Dix Bolles, U. S. Navy, has been detailed by the Secretary of the Navy to special duty in the National Museum, and has accomplished a large amount of important work in connection with the classification of the extensive Eskimo collections in the Museum. Prof. G. Stanley Hall has devoted considerable time to an investigation of the subject of mythology from the psycho-physical point of view, and for this purpose has been granted access to the ethnological collections. Prof. E. D. Cope has continued his studies upon the Batrachia in the Museum collection. The unnamed species of *Acrididæ* have been sent to Mr. Lawrence Brunner, of West Point, Nebraska, at his request, for study.

A selected series of *Lachnosterna* has been sent for study to Dr. George H. Horn, of Philadelphia. Mr. Tyler Townsend and Dr. George Marx, of the Department of Agriculture, have rendered valuable assistance in connection with the preparation of the entomological exhibit for the Cincinnati Exposition. Prof. A. E. Verrill has continued the study of several groups of marine invertebrates dredged by the Fish Commission on the eastern coast of the United States. Prof. S. I. Smith has received for study the crustacea gathered from the same source. Prof. Edwin Linton, of Washington and Jefferson College, has made rapid progress with his studies on Trematode parasites. Prof. Leslie A. Lee is intending to study the Foraminifera collected by the Fish Commission. Mr. J. Walter Fewkes, of the Museum of Comparative Zoology, at Cambridge, Massachusetts, has continued to report upon the free Medusæ collected by the U. S. Fish Commission steamer *Albatross*. Prof. Leo Lesquereux, of Columbus, Ohio, has been engaged in the identification of the fossil plants collected in Oregon by Capt. Charles E. Bendire, and has also determined the species of fossil plants from the John Day River region. His report on this material, including the description of several new species, has been prepared by Mr. F. H. Knowlton for publication in the Proceedings of the U. S. National Museum. A collection of mosses gathered in the Yellowstone National Park have been identified by Prof. Charles R. Barnes, of the University of Wisconsin, who has also identified the mosses collected by Messrs. Lucas and Palmer on the expedition sent out by the Fish Commission and the Smithsonian Institution to Funk Island in the summer of 1887. Dr. John W. Echfeldt, of Philadelphia, has identified several lots of lichens from various localities. Dr. T. F. Allen, of New York, has on several occasions identified specimens of *Characeæ*. Dr. George Vasey, botanist of the Department of Agriculture, has identified several sets of grasses from various places. Prof. L. H. Bailey, jr., of Cornell University, has examined the extensive series of mounted specimens in the herbarium representing the genus *Carex*. A series of American rocks was lent for study to Mr. J. S. Diller, of the U. S. Geological Survey. Mr. J. F. Kemp has published two papers describing the southeastern Missouri lead region, basing his remarks upon collections which were made by him, and which formed a part of the exhibit of the Department of Metallurgy at the New Orleans Exhibition in 1884. These collections are now in the Museum. A drawing of *Pilocarpus pennatifolius* was lent for comparison to Dr. Clement Biddle, U. S. Navy. In accordance with the request of the Smithsonian Institution, July 11, the Navy Department detailed Paymaster William J. Thomson, U. S. S. *Mohican*, to enable him to complete his report on Easter Island, and upon the collections made by himself at that place. Mr. Henry Hemphill, of San Diego, California, has during the past year, as in previous years, rendered valuable assistance to the Department of Mollusks, and has presented much valuable and interesting material. Dr. Will-

iam H. Rush, U. S. Navy, has been a valued friend to the Museum, especially to the Department of Mollusks. Several persons have, as usual, received instruction in taxidermy and photography. A request made by Mr. Robert P. Bigelow for work room in the Museum was granted.

CURRENT ADMINISTRATIVE WORK.

BUILDINGS AND LABOR: POLICE AND PUBLIC COMFORT.

This department is under the charge of Henry Horan, superintendent of buildings.

At the beginning of the present fiscal year the staff employed for police and inspection, under the charge of Henry Horan, superintendent of buildings, consisted of 1 assistant superintendent, 12 watchmen, 5 door-keepers, 1 telephone operator, 1 copyist, 1 mail messenger; for construction, care of buildings and repairs, 4 carpenters, 2 painters; for labor and cleaning, 3 skilled laborers, 16 laborers, 7 cleaners, 2 attendants. For heating and lighting there was employed 1 engineer, with 6 firemen. Extra laborers have been employed from time to time, and particularly in connection with the preparation of the exhibit for the Cincinnati Exposition.

The following paragraphs contain a condensed summary of the most important work accomplished in each month:

1887.

July.—During this month the task of preparing an exhibit for the Minneapolis Exposition was commenced, under the general supervision of Mr. W. V. Cox, chief clerk. The work of packing and shipping the exhibit occupied the time of the greater part of the force until late in August, when Mr. C. A. Steuart, assistant superintendent of buildings, was sent to Minneapolis to superintend the work of unpacking and installing the exhibit. This work was completed on August 31, the opening day of the Exposition.

August.—During this month the work of removing the frame annex east of the Museum building was completed. The material thus obtained was utilized in the erection of work and storage sheds south of the Smithsonian building. Steam-pipes were laid, in order to connect these sheds with the boilers in the Smithsonian building. The collection of scientific instruments was removed from the north hall of the Museum building to a room specially fitted for its reception in the east wing of the Smithsonian building.

September.—Much of the time of the laborers during this month was occupied in rearranging the cases in the Anthropological hall of the Smithsonian building. A large collection of stone images, models of cliff dwellings, and other objects of great weight, was removed from the Museum building to this hall. This work necessitated great care in its execution. A cast of a whale in the south hall of the Museum building was removed from its base and suspended from the ceiling, thus affording additional floor space.

October.—During this month was commenced the erection of sheds south of the Smithsonian building. The arrangement of the material which had been removed from the Museum building to the Anthropological hall in the Smithsonian building was finished. The walls and ceilings in the basement of the Smithsonian building were whitewashed. The sewerage in the basement of the Smithsonian building was repaired. Thirteen walnut cases, formerly used in the Smithsonian building, were reconstructed, to conform to the needs of the Department of Metallurgy. The cases in the Department of Lithology and Physical Geology were re-arranged. The signal clocks throughout the buildings were put in order. Several pine cases were erected in the basement of the Smithsonian building for the use of the Department of Fishes.

November.—The principal work of the month consisted in unpacking the exhibit which had been returned from the Minneapolis Exposition. The rearrangement of the material in their cases occupied much time. Such articles as were not required for exhibition in the Museum were placed in storage. Alterations were made in the natural history laboratory, and the walls of the various rooms painted. Double doors were added to the Secretary's office.

December.—During this month the sheds south of the Smithsonian building were repaired and an additional shed was constructed. Cages and inclosures for the collection of living animals were constructed. Many of the exhibition cases throughout the buildings were repaired. Considerable work has been done in the Ornithological Department. Many of the bird-cases have been reconstructed, new shelving has been put in, and the cases have been painted inside and outside.

1888.

January.—A large number of cases hitherto in use in the north hall were removed to different parts of the Museum building. These were replaced with others, thus necessitating an entire rearrangement of the hall. This work occupied a large force of men during several days. The food collection was removed from the northwest range to the northeast court. The exhibit of the Entomological Department was removed from the southeast court to the southeast range. The cases in the hall devoted to the fishery exhibit were rearranged. Twelve mahogany cases were received for the exhibit of the Department of Graphic Arts and placed in position. Four plates of glass, each 9 feet by 7 feet 3 inches, were successfully set in the case containing the mounted group of bisons. The entire Materia Medica collection was rearranged. A plank walk was constructed around the carpenter shop. The rooms on the first floor east of the north entrance were fitted up for the accommodation of the engineer of property.

February.—During this month the east and west hall were rearranged under the supervision of Professor Mason, curator of the Department of Ethnology. The empty exhibition cases and other property were removed from the southeast court in order to make room for the exhibition of fossils and botanical specimens. The collection of tiles was removed from the west hall to the southwest range. Several war relics, which had been in the custody of the War Department, were transferred from the Winder Building by Museum laborers and placed on exhibition in the National Museum. A section of a large California tree was brought from the residence of Senator Leland Stanford. A storm-door was constructed at the north entrance to the Museum building. Much of the time during this and the following month was occupied in preparing the lecture hall for the annual course of Saturday lectures. Cases were placed in the reconstructed portion of the west wing of the Smithsonian building. A brick wall was built between the offices of the curator of fishes and of the curator of marine invertebrates. The steam-pipes leading to the sheds south of the Smithsonian building were covered.

March.—The Graphic Arts collection was placed in position. The exhibit illustrating the composition of the human body was removed from the northeast court to the southeast range. The material in the old Armory building was overhauled preparatory to a general cleaning.

April.—The objects of stone and iron were removed from the shed on the east side of the Museum building and the shed torn down. The lecture hall was fitted up for stereopticon exhibition in the day-time, the windows being provided with screens, so arranged as to be raised or lowered. Special preparations were made in arranging the lecture hall for the meetings of the National Academy of Sciences. Walks were laid to and from the shops in the rear of the Smithsonian building.

May.—The work of constructing feed and shelter houses and other inclosures for the collection of living animals occupied a considerable portion of the time of the laborers. The spouting on the various buildings was repaired. The awnings were repaired and placed on the windows.

June.—The work of preparing an exhibit for the Ohio Valley Exposition at Cincinnati was continued. A large additional force of mechanics and laborers was employed, and by June 30 ten car-loads of exhibits had been forwarded to Cincinnati. On June 25 Mr. Horan left for Cincinnati to superintend the arrangement of the exhibit, which had been placed under the general supervision of Mr. R. E. Earll.

During the last six months of this year two hundred and eighty-five lights of plate-glass have been fitted in the cases assigned to the Department of Birds, replacing the small lights of common glass hitherto in use in these cases.

ELECTRIC SERVICE.

In August, 1887, a contract was made with a firm of electricians of this city to furnish all material and labor necessary for putting in order the electrical service in the Museum and Smithsonian buildings, the cost being $215. The work was satisfactorily completed. A further agreement was then made with the same firm to keep the electrical apparatus in order for the remainder of the fiscal year, furnishing all material and labor, for the sum of $12.50 a month. The transfer of the electrical service from the care of an employé of the Museum to an outside firm has been made in the interest of economy, and has resulted very satisfactorily. The electric bells, other than those belonging to the Telephone Company, reaching twenty-eight points of the buildings, have been kept in good working order; the clock regulator has been cleaned and repaired; the watchmen's clocks, time dials, and station-boxes in both buildings, numbering twenty-two, have been overhauled and repaired; and all wires have been tested and repaired. The door-bells and burglar-alarms have been tested and are now in good order.

TELEPHONE SERVICE.

The work of this service has been very faithfully and intelligently performed by Miss M. L. Stone, who, in addition to her duties as telephone operator, has had charge of the Bureau of Information, the object of which is to reply to the numerous questions of visitors. The telephone switch-board has a capacity for making one hundred connections. At the present time there are only thirty-seven different circuits in use. There are two separate lines connecting the Museum with the central office in this city. The daily average number of calls through the year is about one hundred. During the year 34,318 connections have been made. Through this office telegrams may be sent by the Western Union Telegraph Company, the Baltimore and Ohio Telegraph Company, and the Government Department telegraph ines.

PROPERTY AND SUPPLIES.

While the general routine work of the Museum has been the same as in former years, some changes have been adopted which are leading to more satisfactory results.

It had heretofore been the custom, through the courtesy of the Department of the Interior, to avail ourselves of the bids received there, in obtaining our supplies, but our needs being widely different from those of all other departments of the Government, it was thought that an independent course might be more satisfactory. Consequently, in May, 1888, proposals were advertised for and contracts were awarded.

During this year Mr. J. E. Watkins, who was holding an important office under the Pennsylvania Railway Company, was offered the position as head of the Department of Property and Supplies, and entered upon his duties January 1, 1888, with the title of Engineer of Property.

Under the supervision of Mr. Watkins the work of bringing up to date the back records of the office was systematically entered upon, and has been vigorously prosecuted; the preparation of a complete list of all articles classed as furniture and fixtures has been begun, and labels and numbers prepared for the same.

FINANCES.

The following statement being supplementary to the detailed report of the Secretary of the Smithsonian Institution, forwarded to Congress December 1, 1888, it has not been thought necessary to repeat the account of expenditures minutely given therein. (See Miscellaneous Document No. 55, Fiftieth Congress, second session.)

During the year ending June 30, 1888, the appropriation received by the Museum for preservation of collections was $116,000; for furniture and fixtures, $40,000; for heating and lighting, $12,000.

PRESERVATION OF COLLECTIONS.

The disbursements paid from the appropriation for preservation of collections for this year are as follows: For services, $97,493.32 was expended; $3,427.25 for general supplies; $8,737.59 for specimens; $2,281.96 for stationery; $783.69 for books; $983.81 for travel; $2,053.27 for freight and cartage, making a total of $115,760.89, which leaves an unexpended balance of $239.11. From this balance there are yet to be paid outstanding liabilities to the amount of $226.18, principally accounts of bonded railways for freight on specimens, which are still awaiting settlement in the Treasury.

FURNITURE AND FIXTURES.

Out of the appropriation for furniture and fixtures this year there has been expended for services $19,203.79; for exhibition cases of various designs, with drawings for the same, and for unit-tables and wing-frames, $7,615.30; for drawers, trays, office furniture and other fixtures, $2,714.51; for brackets, tools, glass, hardware and interior fittings, $4,896.08; for lumber, paints, and oils, $3,080.43; for chemicals, apparatus for laboratory, and for jars and containers for specimens, $675.81; for oak shields, bird-stands, etc., $217.94; for linings for cases, $420.24; for plumbing, tin, lead, slate, tiles, etc., $1,038.11; and for miscellaneous expenses $110.83, leaving an unexpended balance of $26.96.

Detailed list of cases, tables, apparatus, appliances, fittings, etc., made or furnished during the year by persons outside the Museum.

Designs and drawings for cases	$305.00
32 Mahogany, glass screen, upright cases	2,080.00
10 Mahogany Kensington cases	1,100.00
10 Mahogany Kensington cases (small)	468.00
1 Mahogany case, special form (for Bison group)	614.85
1 Mahogany case, special form	157.95
12 Ebonized cherry Kensington cases	1,140.00
1 Mahogany file case	100.00
6 Mahogany half-unit tables	360.00

10 Unit-tables, reinforced	$1,200.00
200 Mahogany wing-frames	86.00
1 Ebonized wing-frame	3.50
Oak shields, bird-stands, etc	217.94
Glass	3,445.16
Lumber	2,323.44
Hardware and interior fittings	1,117.64
Paints and oils	756.99
Drawers, trays, etc	803.26
Office furniture and other fixtures	1,911.25
Plumbing, tin, lead, etc	921.04
Cloth, cotton, felt (lining for cases)	420.24
Chemicals and apparatus	401.32
Glass jars and containers for specimens	274.49
Tools	206.38
Iron brackets	126.90
Slate, tiles, etc	117.07
Miscellaneous articles	110.83

During this year the following cases, articles of furniture, etc., have been made or remodeled in the Museum shop:

Detailed list of cases, furniture, etc., made and remodeled in Museum shop, July 1, 1887, *to June* 30, 1888.

9 Mahogany door screen cases.
1 Mahogany glass screen sloping case.
1 Mahogany wall case (for minerals).
4 Pine cases, special form (built for philosophical instruments).
1 Walnut case, special form (around Etruscan tomb).
1 Oak book-case.
1 Pine standard book-case.
1 Mahogany basket-stand.
6 Pine pier screens.
1 Pine art screen.
2 Sets of book shelves.
5 Walnut bases.
2 Pine bases.
11 Cages for living animals.
9 Stands for plants.
Shed for buffaloes.
1 Large frame for picture.
6 Diaphragms.
32 Upright cases (for Bird hall, Smithsonian Institution), remodeled.
16 Mahogany, glass screen sloping cases, remodeled.
8 Kensington cases, remodeled.
2 Walnut wall cases, remodeled.
2 Walnut table cases, remodeled.
1 Pine book-case, remodeled.
1 Storage case, remodeled.

HEATING AND LIGHTING.

The services of engineer, telegraph and telephone clerks, firemen, and mechanics for this year amounted to $6,053.36; there was expended for electrical work and supplies, $436.50; for telephones, $771.65; for rental of call-boxes, $130; for gas, $950.98; for heating supplies and repairs, $639.73; for coal and wood, $3,014.08; a total of $11,996.30, which leaves an unexpended balance of $3.70.

CORRESPONDENCE AND REPORTS.

This department of the Museum work has since 1886 been under the charge of Mr. R. I. Geare. The correspondence of the Museum has greatly increased during the last few years. In 1881, the first year of occupancy of the Museum building, the number of pages in the press-

copy books of letters written hardly exceeded one thousand, and of these letters fully one-half related to work connected with the fishery investigations of the Tenth Census.

For the purpose of explaining the nature of the correspondence of the Museum at the present time and of showing the large increase in this branch of the administrative work, it is convenient to arrange the Museum correspondence under the following headings: (1) General Museum business, including matters connected with Museum administration, arrangement of foreign exchanges, etc.; (2) replies to requests for technical information; (3) the acknowledgment of gifts, loans, and exchanges; (4) reports upon specimens sent for identification.

Under the first heading 1,959 letters have been written.

Letters containing requests for information are constantly being received, and it is a part of the duty of this office to see that such requests are referred to the proper specialists, and to incorporate their replies in letters conveying the desired information. During the year 2,626 letters of this kind have been received, and their source is indicated in the following geographical summation:

UNITED STATES.

Alabama	34	Kentucky	39	Ohio	102
Arizona	23	Louisiana	8	Oregon	19
Arkansas	28	Maine	21	Pennsylvania	165
California	55	Maryland	53	Rhode Island	16
Colorado	15	Massachusetts	143	South Carolina	18
Connecticut	46	Michigan	43	Tennessee	50
Dakota	18	Minnesota	13	Texas	51
Delaware	9	Mississippi	8	Utah	8
District of Columbia	494	Missouri	30	Vermont	5
Florida	28	Montana	20	Virginia	84
Georgia	17	Nebraska	14	Washington Territory	12
Idaho	7	Nevada	5	West Virginia	19
Illinois	54	New Hampshire	11	Wisconsin	21
Indiana	41	New Jersey	56	Wyoming	7
Indian Territory	4	New Mexico	21		
Iowa	41	New York	317	Total	2,364
Kansas	32	North Carolina	39		

FOREIGN COUNTRIES.

Africa	1	Hawaiian Islands	2	Russia	
Argentine Republic	1	Honduras	1	Sandwich Islands	1
Austria	1	Hungary	2	Scotland	10
Bering Island	2	India	2	Sweden	2
Brazil	12	Ireland	5	Switzerland	2
Canada	29	Italy	4	Tasmania	2
China	2	Japan	14	United States of Colombia	6
Denmark	5	Korea	2	Uruguay	3
Dutch Guiana	1	Mexico	22	West Indies	12
Egypt	2	Newfoundland	1		
England	44	New Zealand	7	Total	262
France	43	Norway	3		
Germany	13	Nova Scotia	2		

More than a thousand acknowledgments of specimens acquired by gift, loan, and exchange have been written.

The number of "lots" of specimens received for examination and report during the year was three hundred and fifty-seven, fourteen of which were transmitted by Members of Congress. This material included birds, insects, minerals, ores, rocks, fossils, ethnological and archæological objects, shells, fishes, mammals, plants, oils, earths, reptiles, birds' eggs and nests, skeletons, fibers, coins, marine invertebrates, fossil wood. The specimens were submitted to the Museum curators, and a report embodying the opinion of the curator has been prepared in every instance for the signature of the Assistant Secretary and for transmission to the sender.

By far the larger proportion of the material sent for examination is of very little value to the Museum collections, although occasionally a specimen is retained for addition to the exhibition or study series. The Museum reserves the right, except when special agreement to the contrary is made, to keep all material sent for examination and report.

Thirty-one lots of specimens were borrowed by curators to aid them in the identification of Museum material. These included twenty-two collections of bird-skins, seven of shells, and three of fossils. The courtesy of the lending was acknowledged by formal letters.

During the year 5,272 pages of press copy-books have been filled with letters relating exclusively to Museum matters.

This office is also charged with the compilation of data for the annual report, with the preparation of a bibliography of the Museum publications and of papers published by Museum officers and other collaborators, and also with the preparation of the list of accessions to the Museum, accompanied by indexes showing (1) the Museum department to which referred, and (2) the geographical source of the accession.

PREPARATION OF LABELS.

During the year 2,159 forms of labels have been printed, as is shown in the following statement:

Department of Birds	1,100
Section of Coins and Medals	431
Department of Metallurgy	273
Section of Materia Medica	164
Department of Ethnology	191
Total	2,159

More than two thousand additional labels were sent to the Government Printing Office during the year. These, however, had not been received at the close of the fiscal year.

Since the instructive value of objects exhibited depends in great part on good descriptive labels, it is hoped that hereafter greater facilities may be afforded for the rapid printing of the same.

THE WORK OF THE MUSEUM PREPARATORS.

The preparation of specimens for exhibition in the Museum, or for the study series, has been satisfactorily continued. The work of modeling has been placed under the charge of Mr. W. T. Hornaday, chief taxidermist.

(*a*) Taxidermists and Modelers.

The work of this department has been unusually important. Early in the year the making of large casts was discontinued, and Mr. Joseph Palmer, modeler, was added to the force of mammal taxidermists. A little later Mr. William Palmer was also assigned to this department, and has accomplished some excellent results in the preparation of small mammals. Mr. Joseph Palmer has rendered valuable service in the mounting of large mammals. In order to complete the systematic administration of this class of work Mr. J. W. Hendley was also added to this force, which thus becomes the Department of Taxidermy and Modeling, under the direction of Mr. W. T. Hornaday, chief taxidermist. This force also includes Mr. A. H. Forney and Mr. George F. Pollock, an unsalaried assistant serving for instruction in taxidermy. During the last month of the year, Messrs. George K. Cherrie and B. W. Mitchell were engaged temporarily to assist in the preparation of the exhibit for the Cincinnati Exposition.

Taxidermy proper.

The event of the year has been the mounting of a series of six of the buffaloes obtained by the Smithsonian Expedition sent out in 1886, and the arrangement of the specimens in a group. The finished group is fitly regardly as a monument to the American bison, and illustrates not only the various stages of growth of the animal from the young calf to a huge old bull of enormous proportions, but the ground-work and natural accessories of the group have also been carefully and artistically worked up to illustrate the habitat of the animal. The whole is regarded as a triumph of the taxidermist's art, and, so far as known, it surpasses in scientific accuracy, and artistic design and treatment, anything of the kind yet produced. The group is the work of Mr. Hornaday, assisted by Mr. Joseph Palmer and Mr. A. H. Forney. The case containing the group is also regarded as a model of its kind, both in elegance of design, and perfect adaptability to its purpose. Its dimensions are as follows: Length 16 feet, width 12 feet, height 10 feet.

The preparation of the group of buffaloes fairly inaugurates a line of work which has been in contemplation for some time, namely, the preparation of a series of artistic groups of American mammals, both large and small, each in its own special case, with natural accessories representing its favorite habitat. The taxidermists have also mounted during the year a group of prong-horn antelopes, of coyotes, prairie-dogs, opossums, gray squirrels and red squirrels, and have also made a beginning on a group of moose and two groups of foxes. The groups of

coyotes, antelopes, prairie-dogs, and opossums were placed on exhibition shortly after the completion of the group of buffaloes, which occurred on March 10, 1888.

The following is a list of the mammals which have been mounted during the year:

Groups of mammals.

American bison* (*Bison americanus*):
- 15703. Adult bull.
- 15697. Adult cow.
- 5686. Young cow.
- 5685. Young bull.
- 15694. Yearling calf.
- 15503. Young calf.

Prong-horned antelopes (*Antilocapra americana*:†
- 15714. Adult male.
- 15713. Adult female.
- 13305. Young male (repaired).
- 15962. Young kid.
- 15963. Young kid.

Opossums (*Didelphys virginiana*):
- 2 adult specimens.
- 2 young.
- 4 old specimens repaired.

Coyotes * (*Canis latrans*):
- 15707. Adult male.
- 15708. Adult female.
- 15491. Young.

Prarie dogs (*Cynomys ludovicianus*):
- 16071. Adult male.
- 14635. Adult female.
- 14636. Adult male.
- 14637. Adult female.
- One burrowing owl.

Northern Gray Squirrels (*Sciurus carolinensis*):
- 3 adult specimens.
- 3 young.

Red squirrels (*Sciurus hudsonius*):
- 2 adult specimens.
- 4 young.

Miscellaneous mammals mounted.

- 15215. Horse Antelope (*Hippotragus equinus.*)
- 16110. Oryx (*Oryx capensis*), head.
- 16140. Red Fox (*Vulpes fulvus*), young.
- 16141. Red Fox (*Vulpes fulvus*), young.
- 16142. Red Fox (*Vulpes fulvus*), young.
- 16162. Gray Fox (*Urocyon virginianus*), young.
- 16163. Gray Fox (*Urocyon virginianus*), young.
- 14630. Esquimo Dog (*Canis familiaris*).
- 16172. Meer-kat (*Cynictis leptura*).
- 15620. African Porcupine (*Hystrix cristata*).
- 13666. Indian Jerboa Rat (*Gerbillus indicus*).
- 2230. Loir (*Myoxus glis*).
- 2494. Franklin's Spermophile (*Spermophilus franklini*).
- 15446. Californian Spermophile (*Spermophilus gram-beech*).
- 16189. Common Mouse (*Mus musculus*).
- 16014. White-footed Mouse (*Hesperomys leucopus*).
- 11120. Jumping Mouse (*Zapus hudsonius*).
- 15641. Pocket Gopher (*Geomys bursarius*).
- 2261. Star-nosed Mole (*Condylura cristata*).
- 7261. Common Mole (*Scalops aquaticus*).
- 2164. Shrew (*Blarina talpoides*).
- 16188. Mole Rat (*Bathyergus maritimus*).

* The first stage of work on this group was accomplished during the latter half of the last fiscal year, but the completion of the mounting and the entire work of grouping is to be credited in the report of the present year.

† Temporarily arranged in a temporary case.

DRY SKINS.

A special feature of taxidermic work during the past year has been the overhauling of the collection of wet skins and the making up of a great many of the duplicates as dry skins suitable for study. The entire force spent about two months in work of this kind, and prepared dry skins as follows:

Primates—Chiefly monkeys from Honduras	13
Chiroptera	2
Carnivora—Bears, lynxes, wolves, weasels, etc	21
Rodents—Porcupines, squirrels, rabbits, agoutis, pacas, etc	22
Ungulates—Deer, chiefly tropical species	7
Edentates—Armadilloes and sloths	6
Marsupials	1
Total	72

The chief taxidermist was occupied during the entire month of June in preparing a special exhibit for the Cincinnati Exposition.

The taxidermists in the Department of Birds during the year performed the following work:

Birds mounted	376
Birds skinned	122
Mounted birds made into skins	955
Mounted birds transferred to new stands	1733
New stands put together	1107
Skins poisoned	20
Large mounted birds repaired	5

Specimens in the flesh collected and received.

Number of mammals skinned and prepared	56
Number collected by the taxidermists	44

MISCELLANEOUS WORK.

An unusual quantity of miscellaneous work has required attention, which tended to lessen the amount of visible results for the year. The The following are a few of the principal tasks completed:

43 mammal skins, heads and skulls were poisoned.
17 mammal heads repaired after return from the Cincinnati Exposition.
8 pairs antlers cleaned and retouched.
7 pairs antlers mounted on shields and hung up.
25 large mammals cleaned and retouched.
24 small mammals cleaned and retouched.
14 mounted mammals were repaired and retouched.
11 large wet skins picked out for exchange.
1 large mounted mammal was dismounted.
16 barrels of solution were made for wet skin collection.
38 barrels and three tanks of wet skins were moved to laboratory.
28 boxes of specimens were received.
14 miscellaneous boxes of specimens were packed and shipped.
41 boxes mounted mammals were packed for Cincinnati Exposition.
9 large cages for living bears, birds of prey, etc., were built by the taxidermists.

From November 8, 1887, to February 1, 1888, the collection of living animals was cared for by the taxidermists.

Mr. Joseph Palmer made a trip to North Platte, Nebraska, and brought back two living buffaloes.

Mr. W. T. Hornaday, the chief taxidermist, was absent one month on a collecting trip to the Pacific coast.

Mr. Joseph Palmer devoted the entire month of June to making casts for the Department of Ethnology.

MODELING AND PAINTING.

Mr. J. W. Hendley has accomplished much valuable work, making painted casts of the specimens constituting the extensive and almost priceless collection of Babylonian and Assyrian seals owned by Mr. R. S. Williams, of Utica, New York. No more important work has engaged Mr. Hendley's attention during his connection with the National Museum, and it is due him to say that notwithstanding the many difficulties attending the casting and painting of agate, chalcedony, onyx, graphite, and crystal seals covered with delicate inscriptions, he has reproduced them all with a degree of skill and fidelity which, it is believed, has never before been attained. In many instances the copies were so exact in color, surface, similarity of substance and weight, that even the owner of the seals several times mistook the copies for the originals. Not only were the seals themselves copied, three complete sets being made, but Mr. Hendley also made a flat impression in black and white of the inscription on each of the cylindrical seals, so that the characters may be studied to the best possible advantage. Of these flat impressions four complete sets were made.

Mr. Hendley has also made thirty-three casts of meteorites for the Department of Minerals, to be used in exchanges.

The more important items of work accomplished by Mr. Hendley during the year may be summarized as follows:

29 Babylonian and Assyrian seals cast and painted, three complete sets, or 87 copies in all.
29 flat impressions of seals made in black and white, four complete sets, or 116 pieces in all.
11 casts of Arkansas iron meteorite.
11 casts of North Carolina stone meteorite.
11 casts of Mexican iron meteorite.
Bartholdi's statue of Roman Soldier repaired and painted.
Busts of Professor Baird and Robert Fulton painted.
Statue of General McPherson repaired and painted.
Siamese coat of arms repaired and regilded.
Large Japanese plaque repaired and pieces restored.
Large heraldic shield repaired and regilded.
3 sets of casts made of the phosphorus, potassium, and sodium for the collection illustrating the composition of the human body.
1 set of casts made to represent the daily food of a man—bread, butter, potatoes, and beefsteak.
2 Ute Indian lay figures made, costumed, and grouped.
3 medals copied.

Notwithstanding the value of Mr. Joseph Palmer's taxidermic work, it has been found necessary to interrupt it from time to time in favor of important work in plaster. During the year he has put together and set up the original plaster model of Crawford's statue of Washington,

repaired two Mexican idols, made a cast of the head of a large moose (in the flesh), and repaired a large group of serpents cast from nature. During the month of June Mr. Palmer took molds of the celebrated Canopus inscriptions, of a large Assyrian obelisk, and two large sculptured slabs in the Episcopal Seminary of Fairfax County, Virginia, at Alexandria.

(*b*) Osteological Preparator.

The work of preparing and arranging osteological material has been greatly interrupted during the past year.

During the months of July and August Mr. Lucas was absent on a collecting trip to Newfoundland and Labrador, while Mr. Scollick, the only assistant, was for seven weeks unable to do any work on account of sickness.

In November the work-rooms were transferred from the Armory to the Laboratory building, together with a considerable amount of material on storage at the former place.

The re-arrangement of the Museum halls necessitated a complete change in the disposition of the cases containing the exhibition series of skeletons, while the growth of the collections rendered it necessary to completely change the arrangement of the study series of birds.

Finally, the month of June was largely devoted to packing specimens for the Cincinnati Exposition.

During the year the collection of alcoholic birds was transferred from the basement of the Smithsonian to the Laboratory building, and while some little work has been done in the way of arranging and caring for them, a great deal of labor will be required to place this valuable collection in thoroughly good order.

Considerable time was spent in assorting the large and valuable collection of bones of the extinct great Auk, secured by the *Grampus* expedition, and besides a mounted skeleton, other preparations have been made relating to the history of this interesting bird.

The following table gives a summary of the material received and of the work of preparation accomplished during the year:

	Received fresh.	Cleaned.	Mounted.	Total.
Mammals:				
Skulls		114	2	116
Skeletons	9	21	8	38
Portions of skeletons		2	1	3
Birds:				
Skulls		3		3
Skeletons	30	26	5	61
Portions of skeletons	2	5	4	11
Reptiles and batrachians:				
Skeletons	1	3	5	9
Fishes:				
Skeletons		10		10
Total	42	184	25	251

(c) PHOTOGRAPHER.

Mr. T. W. Smillie reports that 567 negatives have been added to the permanent files, as shown in the following statement: ethnological, 9; mineralogical, 17; lithological, 21; archæological, 150; historical, 16; osteological, 6; mammals, 76; transportation, 30; Fish Commission, 16; miscellaneous, 181.

Two thousand five hundred and sixty-five prints have also been made: ethnological, 175; mineralogical, 74; lithological, 26; archæological, 226; historical, 170; osteological, 10; mammals, 77; transportation, 34; miscellaneous, 1,228; cyanotypes, 106; enlargements, 33; collection of miscellaneous photographs mounted, 270.

Work for the U. S. Fish Commission: negatives, 61; silver, albumen, and plain prints, 545; cyanotypes, 218; enlargements, 16.

The usual routine work of numbering and filing negatives, making up outfits for expeditions, etc., has been continued.

The illustrating of several of the lectures given in the National Museum has been conducted by means of the stereopticon operated by the photographer and his assistants.

(d) COLORIST.

Mr. A. Zeno Shindler has accomplished during the year the work here specified: Painting cast of two copperhead snakes; repairing and painting a portrait of St. Domingo, making a colored sketch of a Quinnat salmon, making a colored sketch of a rattlesnake, making a colored sketch of a large lizard (British Guiana), painting the cast of the same, water-color painting of a Pimo Indian, weaving; repairing forty fish casts for the Minneapolis Exhibition.

In the Department of Ethnology: Painting three casts of Mound-builders' pipes, repairing cast of a Sioux woman, painting seven busts of Moqui Indians, copies of three Japanese paintings on silk, painting four casts of tablets of ancient sculpture, repairing and repainting nine Mexican idols, painting life-size bust of a Zuñi Indian, three crayon drawings of the Behistom Sculptured Rock, 6 feet by 3 feet; eighty-five Indian photographs colored, making colored sketches of Pacific Ocean invertebrates, repairing two shells, constructing and painting five maps of prehistoric France, four oil paintings of Funk Island, two water-colors of the Great Auk and eggs.

The painting, repairing, and repainting of a considerable number of miscellaneous objects has been also attended to.

(e) PREPARATOR IN THE DEPARTMENT OF ARTS AND INDUSTRIES.

Mr. E. H. Hawley has devoted the greater portion of his time to the preparation of material for exhibition. Among the more important collections which he has installed during the year, were the Hippisley collection of Chinese pottery; the Grant relics; a collection of Japanese

pottery; the Wilson collection of ancient pottery, and a collection of laces. He has also re-arranged the Capron collection, mounted and framed a collection of prints, arranged the collection of Siamese ware, assisted in arranging the collection of Graphic Arts, and also the collection illustrating transportation. In addition he has re-arranged the Japanese bronzes and French pottery, and has superintended the preparatory work on some special exhibits for the Cincinnati Exposition.

II.—GEOGRAPHICAL REVIEW OF THE MORE IMPORTANT ACCESSIONS.

The total number of accessions to the Museum during the year was 1,481.

The alphabetical index of all accessions to the Museum received up to January 1, 1887, has been brought down to date by S. C. Brown, registrar. This forms an excellent means of reference.

The number of packages received containing material sent for examination and report, and specimens borrowed by the curators for use in comparison, 265.

In the list of accessions every specimen received for examination is so entered, although for convenience this material has been incorporated with the general list of accessions proper.

During the year material has been received from every region of the globe, although the bulk of the accessions has come from various parts of the United States.

The following statement includes the more important accessions, arranged according to the localities whence they came.

AFRICA.

Kassai River.—Lieut. E. H. Tanut, U. S. Navy, made a collection of ethnological objects, which were of considerable interest and value.

Egypt.—A collection of fossil woods was given by W. T. Hornaday. This collection is specially valuable for the reason that very few similar collections have before been made.

Dr. James Grant-Bey sent a collection of ethnological objects and some very interesting relics, including scarabs, statuettes, gold seals, etc.

Madagascar.—Edward Bartlett, Chillington House, Maidstone, Kent, England, sent a collection of birds' nests and eggs, and three reptiles.

South Africa.—The Albany Museum, Grahamstown, Cape Colony, sent a collection of shells, in return for material received fron the National Museum.

AMERICA.

BRITISH AMERICA.

British Columbia.—A collection of ethnological objects, made by Dr. Franz Boas, was presented by him to the Museum.

Canada.—Ernest E. Thompson sent two collections of birds, one numbering thirteen specimens, and the other twenty-two.

CENTRAL AMERICA.

Costa Rica.—A very valuable collection of Coleoptera was received from T. D. Godman and O. Salvin.

Señor José C. Zeledon sent three collections of bird skins, birds' eggs, and stone implements.

G. Flemming sent a collection of Indian arrows.

Sereno Watson sent a collection of Costa Rica ferns.

Honduras.—Charles H. Townsend, of the U. S. Fish Commission, sent from this place a collection of ethnological objects, fishes, plants, reptiles, birds' nests, bird skeletons, insects, and a collection of three hundred and twenty-five bird skins.

DANISH AMERICA.

Greenland.—Mrs. Mildred McLean Hazen sent three Eskimo kyaks.

MEXICO.

A very valuable collection of botanical specimens, including many species new to science, was received from C. G. Pringle.

Edward Palmer made a collection of birds, rocks, stone implements and ethnological objects, which were purchased by the Museum.

Messrs. G. B. and W. B. Hyde gave to the Museum two stone images, a spindle, and a loom obtained in Puebla.

A collection of land and fresh water shells, numbering thirteen specimens, was received from R. W. Bastow.

William Brewster sent a collection of Mexican birds.

A collection of Mexican zoological and botanical specimens was received from Señor José N. Rovirosa.

Ward Batchelor sent stone idols obtained by him in Mexico.

Prof. A. Dugès sent for determination a very large collection of Mexican mammals, bird skins, reptiles, shells, insects, corals, plants, fishes, crustaceans, etc.

UNITED STATES.

Alabama.—C. L. Stratton sent a collection of stone implements.

I. C. Russell, of the U. S. Geological Survey, sent a collection of thirty species of fossil plants, a few of which are new to science.

T. H. Aldrich sent a collection of fossils.

Alaska.—A collection of the fossil plants of this region was recived from H. L. Aldrich.

Mrs. George M. Robeson gave a collection of arrows and arrowheads.

A collection of ethnological objects was received from Mrs. Mildred McLean Hazen.

Through the courtesy of Hon. Peter Bonnett, Chief of the U. S. Revenue Marine, and Capt. M. A. Healy, of the U. S. Revenue Marine steamer *Bear*, the Museum was enabled to add to its collections of boats six birdarkas, used by Alaskan natives.

Nichols Grebnitzky sent a collection of shells, fishes, worms, crustacea, sponges, and echini; also a whale, and skeleton of whale, *Ziphius grebnitzkii*.

Arizona.—Herbert Brown sent a collection of birds' eggs.

Lieut. W. L. Carpenter, U. S. Army, sent a collection of mammals, eggs, stone implements, fish, birds, reptiles, among the latter a Gila monster.

Lieut. H. C. Benson, U. S. Army, sent a valuable and interesting collection of birds, and birds' nests and eggs, and reptiles.

Arkansas.—A collection of fifty-two stone implements was received from the Davenport Academy of Natural Science.

J. G. Wallis sent a collection of rocks from this State.

California.—Dr. R. E. C. Stearns sent a large collection of shells, and another collection of shells, ores, rocks, fossils, minerals, etc.

D. W. Coquillet sent one hundred and thirty-three specimens, representing thirty-six species of Diptera.

Edward Palmer sent a collection of birds' eggs, stone implements, materia medica, and a series of plants representing seven hundred and sixty-eight species.

A collection of birds numbering ninety-four specimens, representing twenty-three species, was sent by William Brewster.

F. Stephens sent a collection of mammal skins and birds' eggs.

From the California State Mining Bureau was received a collection of specimens of colmonite.

G. P. Merrill gave three bowlders of glaucophane rock.

Colorado.—A collection of ores and rocks gathered by S. F. Emmons, of the U. S. Geological Survey, was received.

Messrs. Taylor and Brunton, of Leadville, sent a collection of sulphide ores.

A collection of mosses, trout, insects, shells, and mammals was sent by Theodore D. A. Cockerell.

From Denis Galé was received a collection of birds' skins and a collection of birds' eggs, which is of great value, as it contains some very rare species.

C. E. Aiken sent a collection of birds.

Connecticut.—A very large collection of Diptera was received from Dr. S. W. Williston. This collection includes two hundred and sixty-three species, seven hundred and twenty-nine specimens of *Syrphidæ*, which are types of Bull. U. S. National Museum, No. 31. The collection is the most complete and the best of the family extant.

G. L. Faucher sent five arrow-heads.

A collection of Lepidoptera was received from A. F. Wooster.

The Museum of Wesleyan University contributes a collection of shells, selected by William H. Dall.

A collection of birds' eggs and nests was received from John N. Clark.

A collection of minerals was received from E. H. Olmsted.

Dakota.—H. M. Creel presented a collection of ethnological objects obtained from the Indians in this Territory.

District of Columbia.—The following collections of birds and birds' nests were received: Dr. A. K. Fisher sent eleven nests and eighty-five eggs. H. M. Smith sent a small collection of skins, as did W. T. Roberts. Dr. W. H. Fox sent eight species of birds, and a collection of seventy-six nests and nine hundred and fifty eggs was given by C. W. Richmond. Mrs. M. H. Webster gave a cuckatoo paroquet.

S. V. Proudfit sent a collection of one hundred and thirty arrow and spear heads.

E. R. Reynolds gave a collection of two hundred and fifty-nine stone implements, and a collection of similar objects was presented by E. P. Upham.

Two collections of Lepidoptera were given, one by J. S. Tyree, and the other H. F. Shoenborn.

Florida.—Joseph Willcox sent a collection of shells.

E. H. Schwarz sent a collection of Orthoptera and Hymenoptera.

W. O. Crosby sent a collection of minerals.

A collection of Coleoptera was sent by R. A. Mills.

Berlin H. Wright sent a collection of Unionidæ containing types of new species.

Georgia.—L. M. Underwood sent a collection of Arachnida and Myriapoda.

A collection of plants, numbering one hundred and twenty-five species, was purchased from Gerald McCarthy.

Idaho.—Two collections were received from this State, one consisting of a quiver, two bows, and five arrows of the Cœur d'Alene Indians, sent by Lieut. H. T. Allen, U. S. Army; the other, a small collection of living animals and elk antlers, collected by Wm. T. Hornaday.

Illinois.—A collection of sixty stone implements including flakes, scrapers, etc., was received from W. H. Adams.

A. Bridgman, jr., sent a valuable swan's skin.

Indiana.—H. W. Hanna sent a collection of stone implements.

Charles S. Beachler sent eight reptiles and twenty-two fossils.

A large collection of stone implements was sent by John H. Lemon, who also sent a collection of spiders.

An interesting ceremonial weapon was sent by W. H. Dodge.

Mrs. Sarah C. McCormick sent a lot of spear and arrow heads.

The Indiana State University sent a collection of Silurian, Devonian, and Carboniferous shells of great value. This collection includes types of twenty-two species described by Dr. David Dale Owen, in his report on the Geology of Wisconsin, Indiana, and Iowa.

Indian Territory.—W. T. Van Doren sent a head dress, pair of leggins, concretion, and a lot of minerals.

Charles T. Simpson sent a collection of land and fresh water shells.

Iowa.—Dr. F. H. Steinmeyer sent a collection of stone implements.

R. Ellsworth Call sent a collection of reptiles and fishes.

J. F. Kummerfield sent a collection of stone implements.

Kansas.—A collection of flint chips and fragments of stone implements was received from Dr. W. S. Newlon, who also sent a collection of stone and shell implements numbering eighty-seven specimens.

Mr. W. S. Hill sent a very large collection of stone implements.

Kentucky.—The three principal collections received from this State were the following: Birdskins, from C. W. Beckham; shells, Mrs. Sarah C. McCormick; stone implements, fossils, and skull, W. R. Burns.

Louisiana.—Two small collections of Lepidoptera were received, the one being sent by Rev. T. W. Smith, and the other by W. A. Sandos.

Maine.—C. M. Sawyer sent a collection of sixteen stone implements; also polished spear-heads and two quartz scrapers.

James E. Knowlton sent a collection of seventeen stone implements.

G. P. Merrill collected a large number of rock specimens.

Maryland.—Among the objects received from this State was a collection of stone implements given by W. H. Abbott; a collection of birds sent by Henry Marshall; a collection of fossils in eocene marl, received from Lieut. T. Dix Bolles, U. S. Navy; birds sent by George Marshall; a collection of rocks from W. H. Hobbs; and a lot of arrow-heads given by Mary Eliza Jefferson.

Massachusetts.—Great quantities of material are annually received from the U. S. Fish Commission Station at Wood's Holl. During the past year the material received from this source consisted of fishes, birds, marine invertebrates, insects, mollusks, etc.

Willard Nye, jr., sent a collection of ten paleolithic implements.

George P. Merrill collected for the Museum a series of rocks of Massachusetts.

From the Peabody Academy of Science was received a small collection of paleolithic stone implements.

Michigan.—William Palmer, of the U. S. National Museum, presented four birds from this State.

F. E. Wood sent a very valuable collection of plants.

Mississippi.—A collection of fossils was received from L. C. Johnson, and a collection of ethnological objects from Dr. W. A. Whitten.

Missouri.—R. Ellsworth Call sent a very fine crinoid column and a collection of worms and crustaceans; a collection of twenty-seven stone implements, ten of which were paleolithic, was received from Marion Crawford.

Montana.—James Forrestell sent a collection of rocks.

From Dr. A. C. Peale, of the U. S. Geological Survey, were received two specimens of wood opal.

A collection of ethnological objects was received from Messrs. J. I. and T. C. Allen.

From E. C. Babcock was received a very fine white goat-skin.

Nevada.—A collection of ores was received from W. D. Maynard, and a collection of rocks from E. H. Spooner.

New Hampshire.—The material received from this State was mainly ornithological, the two principal accessions being a collection of birds' eggs from Charles F. Morrison, and a collection of sixty-five birds from W. H. Fox.

New Jersey.—Dr. C. Hart Merriam, of the Department of Agriculture, sent a bird.

Theodore Harris sent fishes.

A collection of rocks from this State was received from the U. S. Geological Survey.

W. E. Hidden sent four crystals of black tourmaline.

Thomas Wilson gave a collection of stone implements.

R. E. C. Stearns gave some fossil brachiopods.

Dr. T. H. Bean spent a part of the summer at Somers Point in the interest of the U. S. Fish Commission and incidentally accumulated a large collection of birds, crabs, and fishes, which, through the courtesy of the U. S. Commissioner of Fisheries, was transferred to the National Museum.

New Mexico.—Dr. O. Lincoln sent ten specimens of vanadinite.

Dr. R. W. Shufeldt, U. S. Army, sent a valuable collection of mammals.

Dr. Washington Matthews, U. S. Army, sent dressed buckskin, bone used as a tool, and seven photographs showing process of tanning by the Navajo Indians.

New York.—Dr. B. D. Skinner sent some stone implements, including stone sinkers, arrow and spear heads, water-worn pebbles, fragments of pottery, etc.

From the U. S. Military Academy was received a curious necklace made of human fingers.

From A. G. Richmond was received a large collection of stone implements, numbering three hundred and ninety-six specimens.

A collection of fossils and rocks gathered in New York was sent to the Museum by the U. S. Geological Survey.

Dr. J. C. Merrill, U. S. Army, sent a collection of mammals.

R. Fritsch sent specimens of alabaster.

From George N. Lawrence was received a collection of birds' eggs.

A. A. Duly gave to the Museum a collection of rocks.

From Col. A. G. Tassin, U. S. Army, were received several collections of birds killed by flying against the electric light on the Liberty Statue in New York Harbor.

From L. J. Bennett was received a collection of fossil crustacea, containing many beautiful specimens.

M. K. Barnum sent birds.

Specimens of Hymenoptera were sent by Joseph McAllister.

L. M. Underwood presented a collection of insects.

From Dr. G. F. I. Colburn were received some very interesting relics from the battle-field of Ticonderoga.

North Carolina.—A collection of plants was received from Gerald McCarthy.

A collection of rocks was sent by T. C. Harris.

Specimens of black granite were received from P. Linehan & Co.

A collection of ores was received from W. A. H. Shreiber.

Howard Haywood sent a collection of stone implements, including spear-heads, celts, knives, leaf-shaped implements, tools, quartz crystals.

J. A. D. Stevenson sent a collection of stone implements.

Willard Nye, jr., sent a collection of fifty-three stone implements.

Ohio.—The material received from this State consisted principally of stone implements. Three collections were sent by J. W. Tweed, a collection of fifty-seven specimens by C. T. Wiltheiss, and smaller collections by R. W. Mercer, T. B. Bowers, James C. White, Lafayette Faris, Howard Bell, and D.T. D. Dyche.

An interesting and valuable collection of fossil plants containing some new species was received from H. Herzer.

Oregon.—Several very valuable collections were received from Dr. J. C. Merrill, U. S. Army. These collections included crayfishes, insects, fishes, reptiles, mammals, land and fresh water shells, and a very valuable collection of birds' eggs and nests.

C. K. Smith sent two collections of stone implements, one numbering thirty-three specimens and the other seventeen specimens.

Pennsylvania.—Two collections of minerals were received, the one a series of twenty-eight specimens, sent by William J. Mullins, and the other a collection of cut stones, sent by James W. Beath.

Three collections of stone implements were received, one of which included three hundred and fifty-five specimens; the two other collections received were from C. P. Emmons and Howard B. Davis.

Rhode Island.—The contributors of material from this State were W. O. Crosby, who sent a collection of minerals, Capt. H. M. Knowles, who sent a collection of fishes, M. A. Keach, who gave some shells, and Joseph Church & Co., who sent a collection of fish and clams.

South Carolina.—E. E. Jackson sent an Indian pipe.

A collection, including ninety specimens, of spear-heads, arrow-heads, and a discoidal stone, was received from Joseph Ward.

Tennessee.—A large amount of material was received during the year from Dr. J. C. McCormick, and subsequently from his widow, Mrs. Sarah C. McCormick. The collection sent by them included human bones and pottery from Tennessee mounds, plants, birds, fish, skeletons of horse, deer, gray fox, and man, and a collection of fossils, Upper Silurain, Devonian, and Carboniferous.

James M. Null sent a collection of stone implements, numbering two hundred and seventy-one specimens.

Dr. J. M. Drake sent a collection of stone implements.

E. W. Mort sent specimens of ore.

Texas.—A collection of meteoric stones was received from Messrs. Ward and Howell, of Rochester, New York.

J. A. Singley sent a collection of fresh-water shells.

C. W. Beckham sent a large collection of birds, including fifteen species and numbering two hundred and nineteen specimens.

G. B. Benners sent birds.

Utah.—Dr. C. W. Higgins sent several living mammals, among which were a spotted lynx, a red fox, a badger, and a golden eagle.

Vermont.—G. H. Perkins sent a collection of forty-six stone implements.

A collection of rocks, ores, fossils, stone implements, and plants was received from F. H. Knowlton.

Virginia.—Robert Ridgway sent several collections of birds, nests, and eggs.

L. M. Underwood sent a collection of insects.

A collection of pottery was sent by William Palmer.

J. M. Whitside presented a collection of Coleoptera and Hymenoptera. Dr. A. S. Payne sent a collection of stone implements, marbles, and ores.

Several single specimens were received, amongst which are a white eagle from Willie Taylor, a specimen of ore from A. Wise, and a rainbow trout presented by the U. S. Fish Commission.

Washington.—A new species of a new genus of a fish, *Acrotus willoughbii*, was sent by Charles Willoughby.

A collection of ethnological specimens was sent by Mrs. Anna C. McBean.

James G. Swan sent a carved totem post and two models of Indian lodges.

West Virginia.—Prof. I. C. White sent a collection of Orthoptera.

Wisconsin.—From J. E. Gere was received a collection of stone implements, including plates, scrapers, cutting tools, perforater, spearheads, pierced tablet, leaf-shaped implements; also fossils.

A collection of mosses and lichens was presented by J. H. Schuette.

H. Beach sent a collection of stone implements.

Wyoming.—A collection of birds' eggs was sent by Charles F. Morrison.

WEST INDIES.

C. B. Cory sent a collection of reptiles obtained from these islands. W. T. Hornaday sent a collection of fossil woods, which is specially interesting and valuable, as this region has been rarely visited by collectors of such material.

Cuba.—Louis Schmid & Son sent a parrot.

SOUTH AMERICA.

Chili.—Señor José Smith Solar sent a Chilian coin, and a hat of the type worn by the gentlemen of Chili.

Diamantina, Lower Amazon.—A collection of bird skins from this region was presented by C. B. Riker.

Salvador.—J. Fleming sent a collection of pottery.

United States of Colombia.—A collection of Chiriqui pottery was received from J. A. McNiel.

H. K. Coale sent a collection of birds' skins obtained in various parts of South America.

ASIA.

Asia Minor.—Otto Goldfuss sent a collection of shells from this region.

China.—P. L. Jouy, of the National Museum, contributes a collection of forty-nine bird skins and another collection of birds, numbering nineteen specimens and representing fourteen species. These collections were made by himself while in China.

Mr. Oliver B. Adair sent a collection of coins.

Corea.—From P. L. Jouy was obtained a collection containing the following objects: Bird skeletons, ax, roadside sign-post, mortuary pottery consisting of earthen pots, vases, bowls, jars, cups, bottles, flower stand, and also a collection of Corean medicine.

India.—H. K. Coale sent a collection of bird skins.

Japan.—Among the foreign institutions with which the Museum carries on exchange of material is the Department of Education, Tokyo, Japan. From this source has been received a collection of meteoric stones containing iron, and anorthite crystals from a lava stream during an eruption in 1874, and sapphire crystals and tin washings; also four blocks of lacquer work. A large collection of bird skins was also received.

Lieut. T. Dix Bolles, U. S. Navy, presented three Japanese swords, ivory carving, writing-case and material, collected by himself in Japan.

EUROPE.

England.—The following collections were received: F. H. Butler, of London, sent a collection of minerals; Edward Lovett sent fifty-one stone implements; J. W. Clark sent bones of extinct tortoises and Didine birds; Robert Hadfield sent a collection of manganese steel; R. N. Worth, curator of the Plymouth Museum, sent a collection of rocks in exchange for Museum material.

France.—A large collection of casts of heads of individuals of the different human races was received from the Musée d'Histoire Naturelle in Paris.

Germany.—Dr. J. W. Eckfeldt sent a collection of mosses and lichens.

Greece.—Otto Goldfuss sent a collection of land and fresh water shells.

Norway.—From the Stavanger Museum were received twenty birds skins.

Russia.—J. Von Siemaschko, St. Petersburg, Russia, sent two pieces of meteoric stone.

Specimens of copper ore were received from G. W. Maynard.

A collection of plants, obtained at Spitzbergen by Dr. Emil Bessels, was presented by him to the Museum.

The late Dr. Charles Rau bequeathed to the National Museum a large collection of European stone implements, numbering four hundred and seventy-four specimens.

Wales.—T. A. Redman sent a specimen of gold in quartz.

OCEANICA.

AUSTRALASIA.

Australia.—A collection of ores, minerals, and rocks was received from the Australian Museum.

Edward Bartlett sent a collection of ethnological objects, land shells, and a series of Coleoptera, which is the first representation in the Museum of Australian insect life.

New Zealand.—From S. H. Drew, of Wanganui, was received a collection of fossil shells, in exchange.

Tasmania.—A collection of one hundred and thirty-six specimens of wool from Tasmania, New South Wales, and Queensland was received from the Technological Museum.

MALAYSIA.

The Zoological Society of Philadelphia presented a monkey received from Java.

POLYNESIA.

Easter Island.—Paymaster William J. Thomson, U. S. Navy, deposited a valuable collection of ethnological objects, including spear-heads, paddles, oars, clubs, skull, tapa cloth, head-dress, idols, and stone implements, together with photographs of the island and of various objects used by the natives; obtained by him while attached to the U. S. S. *Mohican.*

Hawaiian Islands.—The Queen of Hawaii, through Hon. H. A. P. Carter, minister for Hawaii at Washington, presented a canoe of the kind used by the natives of Hawaii. This canoe has many remarkable and interesting characteristics, and is a very valuable addition to the collection of naval architecture.

A collection of bird skins and bats, including some very rare species, was presented by Valdemar Knudsen.

A collection of ethnological objects was presented from Polynesia by Messrs. Parke, Davis & Co.

I.—CO-OPERATION OF THE DEPARTMENTS AND BUREAUS OF THE GOVERNMENT.

Much valuable material is annually received by the Museum from the various Departments and Bureaus of the Government, and the National Museum acknowledges its grateful indebtedness for many important collections which have been obtained through their co-operation.

President Cleveland presented a living specimen of golden eagle. This bird was given to the President by Thomas Tomlinson, of Tate Springs, Tenn., and was transferred to the National Museum by Col. John M. Wilson, U. S. Army.

DEPARTMENT OF STATE.

A collection of foreign flags, sixty-seven in number, purchased by the Department for exhibition at the New Orleans Exposition, has been transmitted by Mr. Charles S. Hill, representative of the Department at the New Orleans Exposition.

A collection of one hundred and thirty-six samples of wool was received from the Technological Museum at Sydney, New South Wales, through Hon. G. W. Griffin, United States consul at Sydney.

Hon. William T. Rice, United States consul, Horgen, Switzerland, forwarded a collection of antique coins of copper, silver, and gold; from Ceylon, Europe, United States, and South America; and also presented six copper coins made by the English Government for Ceylon.

The Shah of Persia sent to the Department specimens of gold-bearing quartz, with the request that an analysis be made. The specimens were forwarded by the Secretary of State to the Smithsonian Institution. An analysis was made and was transmitted, with the gold button, to His Majesty through the Department of State.

Through this Department the Queen of Hawaii presented to the National Museum a canoe similar to those in use by the natives of Hawaii.

We are under many obligations to the Department for its courtesy in securing the kind offices of United States ministers and consuls in foreign countries in behalf of the National Museum.

TREASURY DEPARTMENT.

The Secretary of the Treasury has on several occasions aided the scientific work of investigators by allowing the free passage of scientific outfits. Much valuable assistance has, through the courtesy of the Department, been extended to explorers and collectors by the customs officers at various points.

Life-Saving Service.—For several years past the Smithsonian Institution has, through the kindness of Hon. S. I. Kimball, Superintendent of

the Life-Saving Service, enjoyed the assistance of the keepers of life-saving stations at various points along the Atlantic coast, in the matter of reporting the capture of whales and other large species of fishes. As the result of this co-operation during the year a specimen of file-fish, *Alutera schœpfii*, was obtained from Capt. Herbert M. Knowles, keeper of the life-saving station at Point Judith, Rhode Island. Captain Knowles also forwarded two specimens of *Epinephelus niveatus*, one of the smallest members of the family of "Groupers." This species is rarely found so far north, but is common in the West Indies and thence north to Florida. From Amasa Bowen, keeper of the life-saving station at Atlantic City, New Jersey, was received a pigmy sperm-whale.

Bureau of Engraving and Printing.—Through the courtesy of Hon. E. O. Graves, Chief of the Bureau of Engraving and Printing, a collection consisting of one hundred and thirty-two stripped India proofs of United States notes, certificates, and bonds was obtained. Two numbers of "Graphische Kunste," containing lithographs of paper money of France, Germany, Italy, and other nations, were also received from Mr. Graves.

Revenue Marine Division.—During the year 1887 the assistance of the Revenue Marine Division, under the charge of Hon. Peter Bonnett, was asked in the matter of procuring for the National Museum specimens of "bidarkas," or Eskimo kyaks. Capt. M. A. Healy, then of the revenue steamer *Bear*, was requested by Mr. Bonnett to obtain specimens, if possible, on his next visit to Alaska. His efforts were successful, and upon his return to San Francisco six "bidarkas" were placed in the hands of the Alaska Commercial Company, with the request that they be transmitted to Washington for the National Museum.

WAR DEPARTMENT.

Following the custom of previous years, the Secretary of War has permitted the quartermasters of the Army to forward from their respective posts, boxes containing specimens of natural history intended for the National Museum. This privilege has been of great benefit to the Museum, and has resulted in the acquirement by the Museum of large and valuable collections which, owing to the difficulty and expense of transportation by the ordinary means, would perhaps have been withheld from transmission.

By authority of the Secretary of War, General S. V. Benét, Chief of Ordnance, transmitted from the Ordnance Museum a plaster model of the equestrian statue of General McPherson; a section of an oak tree, cut down by musket-balls near Spottsylvania Court-House, Virginia, and presented to the War Department by General N. A. Miles, U. S. Army; a Mexican saddle and bridle, manufactured in Mexico for General Trevino, commanding the northern line of Mexico, and presented by him to General E. O. C. Ord, U. S. Army, by whom they were deposited in the Ordnance Museum on March, 23, 1878.

In connection with the preparation for the Cincinnati Exposition of an exhibit to illustrate the use of photography in scientific work, Dr. John S. Billings, U. S. Army, curator of the Army Medical Museum, was asked for assistance, and contributed a collection of twenty-two photographs, illustrating the uses of photography as applied to the work of the Army Medical Museum. Lieut. J. H. Beacom, U. S. Army, contributed the head and skin of a lake trout, and a photograph of a specimen of the same species.

Lieut. W. L. Carpenter, U. S. Army, a highly valued friend of the Smithsonian Institution, has sent some large and interesting collections from Fort Apache, Arizona. These included reptiles, fishes, skins and eggs of birds, a living Gila monster, *Heloderma suspectum*, and arrowheads. Lieutenant Carpenter has for many years been interested in natural history research and his co-operation has always been very highly prized.

Lieut. H. C. Benson, U. S. Army, stationed at Fort Huachuca, Arizona, whose co-operation the Smithsonian Institution has enjoyed for several years, has continued his excellent work in collecting specimens of natural history for the National Museum, and during the year has contributed the skins and eggs of numerous species of birds and several reptiles. The skin of a *Trogon*, included in one of the sendings, differs from all other specimens of *T. ambiguus* in the collection, and may represent a new species.

General M. C. Meigs, U. S. Army, presented a collection of trade circulars, which contain much valuable information in regard to American industries.

A living specimen of Virginia deer, *Cariacus virginianus*, was received from Capt. R. L. Hoxie.

Dr. J. C. Merrill, U. S. Army, for many years a warm friend of the Museum, has continued to make additions to the collections, and this year contributed mammals, birds' nests and eggs, insects, shells, reptiles, fishes, and crustacea.

Dr. R. W. Shufeldt, U. S. Army, has sent mammals, birds, and ethnological objects from Fort Wingate, New Mexico.

Specimens of birds which had been killed by striking against the electric light on the statue of Liberty on Bedloe's Island in New York Harbor were received from Col. A. G. Tassin, of Fort Wood, Bedloe's Island.

A curious necklace, composed of human fingers, and collected by Capt. John G Bourke, U. S. Army, was contributed by the U. S. Military Academy at West Point.

A short-eared owl, *Asio accipitrinus*, was sent by Surgeon T. E. Wilcox, U. S. Army.

A collection of bows and arrows of the Cœur d'Alene Indians was received from Lieut. H. T. Allen, U. S. Army.

The honorary services of Capt. Charles E. Bendire as curator of birds'

eggs, and of Dr. H. C. Yarrow as curator of reptiles and Batrachians, have been continued.

NAVY DEPARTMENT.

The Museum has received much valuable material during the year through the co-operation of officers of the United States Navy. Commodore John G. Walker, Chief of the Bureau of Navigation, has, as in previous years, given valuable assistance.

A large collection of ethnological objects, including spear-heads, paddles, oars, clubs, feather head-dresses, wooden idols, specimens of tapa, skulls, etc., were obtained by Paymaster W. J. Thomson on Easter Island, and were deposited by him in the Museum, together with a series of photographic views.*

Lieut. T. Dix Bolles gave collections of mammals, fossils, and ethnological objects.

A collection of ethnological objects from Kassai River, Central Africa, was made by Lieut. E. H. Taunt, U. S. Navy, and presented by him to the National Museum.

Dr. H. G. Beyer, U. S. Navy, continued to act until October, 1887, as honorary curator of the Section of Materia Medica, at which time he was ordered elsewhere for duty by the Department.

To the great regret of the Museum, Lieutenant Bolles, who has rendered exceedingly valuable services in the Ethnological Department, especially in connection with the work of classifying and arranging the Eskimo collections, has been recalled, having been assigned to active duty.

INTERIOR DEPARTMENT.

The National Museum is especially indebted to the Secretary of the Interior for the disbursement of the Museum appropriations, which has been very promptly and satisfactorily attended to by Mr. George W. Evans, disbursing clerk of the Department of the Interior.

Patent Office.—Two valuable ancient Greek coins have been contributed by Alexander Scott.

Indian Office.—A sketch of a fish was forwarded by Charles Willoughby, of Quinaielt Agency, Washington Territory, with a request for identification. The fish itself was transmitted later, and proved to be a new genus and species. In honor of Mr. Willoughby the scientific name of *Acrotus willoughbyi* has been given to this species by the National Museum.

U. S. FISH COMMISSION.

Through the courtesy of Colonel McDonald the Museum has continued to enjoy the valuable co-operation, as curators, of several attachés of the Commission, and collections made by the vessels of the Fish Com-

*An illustrated paper describing this collection is being prepared by Paymaster Thomson, and will be published in a future report of the Museum.

mission have been transferred to the custody of the Museum. This co-operation between the Smithsonian Institution and the Fish Commission has existed since the organization of the latter, at which time Prof. Spencer F. Baird, then Assistant Secretary of the Smithsonian Institution, was appointed U. S. Commissioner of Fish and Fisheries, and it is sincerely hoped that it will always continue.

The most important accession to the Museum, resulting from the co-operation of the Fish Commission with the Museum, was a series of collections obtained by the U. S. Fish Commission schooner *Grampus* during her expedition to Funk Island, which was organized primarily for the purpose of obtaining bones of the great auk. The expedition was very successful, and in addition collections of fishes, bird skins, birds' eggs, shells, echinoderms, sea anemones, surface towings, crustacea, copper ores, fossil shells, living birds, skins and skulls of meadow lark, and rocks were made and transferred to the Museum. Dr. T. H. Bean, while engaged in work for the Commission on the coast of New Jersey, collected fishes, crabs, star-fishes and sea-urchins in the vicinity of Great Egg Harbor. Fishes and cray-fishes were sent from the Central Station of the Commission, in Washington, from the Wytheville Station, in Virginia, and from the station at Havre de Grace, Maryland.

Collections of fishes, crustaceans, and insects were received from the summer station of the Fish Commission at Wood's Holl, Massachusetts. Important contributions of fishes, marine invertebrates, and mollusks were received from the U. S. Fish Commission steamers *Albatross* and *Fish Hawk*. Mr. Vinal Edwards contributed collections of fishes, birds, birds' nests, parasites, surface towings, crustaceans, and turtles.

The services of Mr. Richard Rathbun as honorary curator of marine invertebrates, of Dr. T. H. Bean as honorary curator of fishes, of Capt. J. W. Collins as honorary curator of naval architecture, and of Mr. R. E. Earll as honorary curator of fishes and of animal products, have been continued, through the courtesy of the Commissioner, and sincere acknowledgments are due for their valuable labors.

U. S. GEOLOGICAL SURVEY.

The Museum has enjoyed the co-operation of the officers of the Geological Survey, and this has resulted in much benefit to the Museum.

Dr. C. A. White continues to act as curator of Mesozoic Fossils; Mr. C. D. Walcott, of Paleozoic Fossils; Mr. Lester F. Ward, as curator of Botany; Prof. F. W. Clarke, as curator of Minerals, and Mr. William H. Dall and Dr. R. E. C. Stearns as curator and adjunct curator, respectively, of Mollusks.

Among the collections of fossils, rocks, ores, and minerals made by officers of the Geological Survey and transferred to the National Museum may be specially mentioned those which were collected by Messrs. Frank Burns, W. G. Brown, Whitman Cross, C. W. Cunningham, William H. Dall, S. F. Emmons, W. F. Hillebrand, L. C. Johnson, R. E. C. Stearns, and C. D. Walcott.

J.—EXPLORATIONS.

In October, 1887, a Department of Living Animals was organized, chiefly for the purpose of affording opportunity for study in connection with certain kinds of work then being prosecuted in the Museum. It was decided that hereafter all gifts of living animals which might be offered to the Museum would be accepted, cared for in the best manner possible, and exhibited, with due credit to the donors. It was also decided that whenever it was found possible to purchase a living wild animal for study purposes at a nominal price, it might be done. In accordance with this determination, Mr. W. T. Hornaday was permitted by the U. S. Commissioner of Fish and Fisheries to make a collecting trip on fish car No. 1 to and through Dakota, Montana, Idaho, Washington, Oregon, and Utah in the interest of this department.

Mr. Hornaday left Washington on October 8, with Mr. J. Frank Ellis, in charge of the car, and proceeded westward. In the course of the work of distributing fish the car made brief stops at St. Paul; Fargo, Dakota; Mandan and Helena, Montana; Tacoma, Washington; Portland, Oregon; Mountain Home, Idaho, and Salt Lake City, Utah. As soon as it became known at those points that the National Museum was ready to accept gifts of living animals, several specimens were presented, and others of desirable kinds were purchased at nominal prices. The most important of the animals collected and brought to Washington by Mr. Hornaday were the following: 1 Columbian black-tailed deer (*Cariacus columbianus*), 1 mule deer (*Cariacus macrotis*), 1 white-tailed deer (*C. virginianus*), 1 cinnamon bear (*Ursus cinnamomum*), 2 badgers (*Taxidea americana*), 2 red foxes (*Vulpes fulvus fulvus*), 1 cross fox (*Vulpes fulvus decussatus*), 2 spotted lynxes (*Lynx maculatus*), 5 prairie dogs (*Cynomys ludovicianus*), and a golden eagle (*Aquila chrysætus*). All of these animals were brought back in the fish car, a task which involved infinite labor and care. The trip, on the whole, was a highly successful one, and the relations established with Western hunters and collectors are certain to prove of value to the Museum. The car returned to Washington on November 8, having traveled over 7,000 miles.

In the summer of 1887 arrangements were made for a joint expedition by the U. S. Fish Commission and the Smithsonian Institution to Funk Island and the coast of Newfoundland. The Fish Commission tendered the use of the schooner *Grampus*, which was to be engaged, under the command of Capt. J. W. Collins, in the investigation of certain fishery problems, and Messrs. F. A. Lucas and William Palmer were detailed from the National Museum to accompany the expedition.

An examination of Funk Island was made, and a large number of bones of the Great Auk were collected, including several crania and many hundred vertebræ, and leg and wing bones. The coasts of Newfoundland, of New Brunswick, and the Magdalene Island and adjacent

islands were also visited with a view to collecting specimens illustrating the fauna, flora, and geology of the regions. The collectors were very successful. They secured about two hundred bird-skins, a large series of birds' eggs and nests, fishes, mammal skins and skeletons, marine invertebrates, fossils, plants, rocks, and copper ores.

Interesting collections were received from Mr. Charles H. Townsend, who visited Central America by direction of the U. S. Commissioner of Fish and Fisheries. The material obtained included plants, a collection of bird-skins numbering over three hundred specimens, a collection of tropical insects, a small collection of mammal skins, skulls, and skeletons, bird skeletons, birds' nests, fishes, reptiles, stone implements, and twenty-seven ethnological objects.

K.—REPORT UPON THE PARTICIPATION OF THE SMITHSONIAN INSTITUTION IN THE INDUSTRIAL EXPOSITION AT MINNEAPOLIS, 1887.

By William V. Cox.

In accordance with joint resolution No. 18, which authorized the several Executive Departments of the Government to lend to the Minneapolis Industrial Exposition of 1887 certain articles for exhibit, Dr. G. Brown Goode, Assistant Secretary of the Smithsonian Institution, in charge of the National Museum, being unable himself to leave his official post, appointed W. V. Cox, chief clerk of the National Museum, representative to the Exposition. A copy of the letter making this appointment is given herewith, and also a copy of joint resolution No. 18.

[Public Resolution No. 18.]

JOINT RESOLUTION authorizing the several Executive Departments of the Government to loan to the Minneapolis Industrial Exposition certain articles for exhibit.

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That it is desirable, in any way consistent with existing laws and without risk to Government property or expense to the National Treasury, to encourage the effort being made for the opening and holding of a grand industrial and educational exposition of the Northwest at the city of Minneapolis, in the State of Minnesota, and the interests of the whole northwestern section of our country demand it to be made an unqualified success; and it be, and is hereby, approved that the heads of the several Executive Departments shall, in whatever respects they may in their judgment see convenient and proper, loan any articles or material suitable to such purpose: *Provided*, That such loan be made entirely on the responsibility of said Minneapolis Industrial Exposition, and shall not be of material needed for use in either Department, and shall not in any way interrupt the daily routine of duty or order in any branch of the Government, and shall be returned to the proper Department, in good order, within one month after the close of the exposition: *And provided further*, That before any such loan shall be made, the proper head of the Department shall require and receive a good and sufficient bond, by or in behalf of such exposition, for the safe return thereof as aforesaid, and to indemnify and save harmless the Government of the United States, or any Department thereof, from any liability or expense on account thereof, or on account of this resolution.

Approved March 3, 1887.

SMITHSONIAN INSTITUTION, U. S. NATIONAL MUSEUM,
Washington, June 1, 1887.

SIR: In addition to your regular duties, you will take charge of the Smithsonian and Museum part of the Minneapolis Exposition, and represent me in all transactions with the board of management, as may be necessary under joint resolution of Congress (No. 18). You will confer with me only upon questions of general policy, relieving me entirely of all matters of detail.

As representative to the exposition, it will be necessary for you, at its conclusion, to submit a report on same.

Very respectfully,

G. BROWN GOODE,
Assistant Secretary Smithsonian Institution,
in charge of U. S. National Museum.

Mr. W. V. COX,
Chief Clerk National Museum.

Mr. Fred. Brackett, Washington agent of the exposition, was assigned to the duty of collecting and forwarding to Minneapolis the exhibits from the various Departments of the United States Government, and of receiving these exhibits on their arrival at their destination. To Mr. Brackett's efficient discharge of these services, both in Washington and Minneapolis, much of the success which attended the Government display at the exposition is due.

Before the Government exhibit left Washington the board of managers of the exposition gave bond in the sum of $5,000 for its safe-keeping while it should be in their charge, and, in addition, allotted $850 to cover the expense of preparation, packing, and repacking the exhibit, and for freight charges both ways. The car-load of cases and exhibits left Washington for Minneapolis August 22, but did not reach its destination till August 26. By hard work, however, nearly the entire exhibit—20,157 pounds—was in order and ready for exhibition on the morning of August 31, the day of the opening of the exposition.

The immense building, 336 by 356 feet in size, with floor space of 7½ acres, provided for the exhibition, proved insufficient for the general display, and the managers found it necessary to assign smaller space to the Government exhibits than had at first been allotted. A part of the ladies' reception-room was, however, finally partitioned off as an annex to the space for the display of the Smithsonian Institution and the National Museum, which may be briefly enumerated as follows:

I. Ethnological exhibit, including prehistoric relics of America, casts, lay figures, models, etc. An extensive series of casts of Indian faces, Zuñi objects, etc.
II. Textiles and fabrics.
III. Display in the department of metallurgy.
IV. Deer antlers and horns.
V. Casts of fishes of North America.
VI. Photographs of Government buildings.
VII. Articles illustrating the composition of the human body.

The ethnological display included relics of the prehistoric tribes of America, together with a large collection of Eskimo and Indian costumes, carved dishes, spoons, children's toys, and a collection of the

musical instruments and of the various war implements of the savage tribes of this and other countries; models and lay figures dressed in the costumes of different lands; and an extensive series of casts of Indian faces, representing and accentuating race and individual peculiarities and characteristics.

In the section relating to domestic industry many of the agricultural implements in daily use in foreign countries, especially in China and Japan, were shown; also articles of clothing, cooking utensils, chop-sticks, carpenters' tools, etc.

There were also exhibited tablets showing the different stages in making Japanese lacquer-work of the ordinary kind, and of the raised gold lacquer, with explanatory cards describing the same.

In the department of textiles and fabrics the exhibit ranged from the different varieties of hemp, flax, China-grass, worsted yarn for carpet weaving, and specimens of the different styles of carpets, to samples of the finest Italian and French silk-weaving. This exhibit also included silk moths and cocoons in the various stages of development, many specimens of unwoven silk, and a historical sketch of the silk industry in America, indicating the sources and varieties of the different grades of silk.

In the department of metallurgy were shown fac-similes of some of the most famous Australian gold nuggets.

In the division of natural history the display of antlers and horns of the American deer was extensive, and there were also shown many casts of the fishes of North America, besides other objects.

Large photographs of the Department buildings in Washington, and of the Smithsonian Institution and National Museum, their laboratories and workshops, were shown. There were also many interior views of the Museum, displaying articles that could not otherwise be shown.

Articles illustrating the composition of the human body, its daily income and expenditure, were exhibited, with specimens of the chemical elements and compounds of the body, and models of the articles of food constituting a day's ration for a man of average size.

The entire Government exhibit proved to have been so selected and arranged as to attract attention to all its parts in about an equal degree. So much interest, in fact, was felt that the exposition management made repeated requests to keep the articles for the following year. In spite of the great desire manifested to insure another exhibit in 1888, the entire Government property was returned in November, having suffered no injury beyond the breaking of a few panes of glass in the cases.

I am greatly indebted to Professor Mason for valuable assistance in arranging the ethnological exhibits, and to Professor True for like aid in selecting and classifying specimens in the department of mammals. Mr. Upham also gave efficient help in the matter of prehistoric relics, and Superintendent Horan and Assistant Superintendent Stewart were untiring in the work of boxing, packing, shipping, and installing the exhibit.