

ANNUAL REPORT  
OF THE  
BOARD OF REGENTS  
OF THE  
SMITHSONIAN INSTITUTION,  
SHOWING  
THE OPERATIONS, EXPENDITURES, AND CONDITION  
OF THE INSTITUTION


FOR THE  
YEAR ENDING JUNE 30, 1893.

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REPORT  
OF THE  
U. S. NATIONAL MUSEUM.

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WASHINGTON:  
GOVERNMENT PRINTING OFFICE.  
1895.



FIFTY-THIRD CONGRESS, SECOND SESSION.

*Resolved by the Senate (the House of Representatives concurring),* That there be printed of the report of the Smithsonian Institution and the National Museum for the year ending June 30, 1893, in two octavo volumes, 10,000 copies, of which 1,600 copies shall be for the use of the Senate, 2,000 copies for the use of the House of Representatives, 5,000 copies for the use of the Smithsonian Institution, and 2,000 copies for the use of the National Museum.

378.

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REPORT  
OF THE  
U. S. NATIONAL MUSEUM,  
UNDER THE DIRECTION OF  
THE SMITHSONIAN INSTITUTION,  
FOR THE  
YEAR ENDING JUNE 30, 1893.

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REPORT OF THE U. S. NATIONAL MUSEUM FOR THE YEAR  
ENDING JUNE 30, 1893.

SUBJECTS.

- I. Report of the Assistant Secretary of the Smithsonian Institution,  
in charge of the National Museum, with Appendices.
- II. Papers describing and illustrating collections in the U. S. National  
Museum.



UNITED STATES NATIONAL MUSEUM,  
UNDER DIRECTION OF THE SMITHSONIAN INSTITUTION,  
*Washington, December 1, 1893.*

SIR: I have the honor to submit herewith a report upon the present condition of the U. S. National Museum, and upon the work accomplished in its various departments during the fiscal year ending June 30, 1893.

Very respectfully,

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

Mr. S. P. LANGLEY,  
*Secretary, Smithsonian Institution.*





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PART I.

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REPORT

UPON THE

CONDITION AND PROGRESS OF THE U. S. NATIONAL MUSEUM  
DURING THE YEAR ENDING JUNE 30, 1893.

BY

G. BROWN GOODE,

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





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### I.—GENERAL CONSIDERATIONS.

The work of the past year in the Museum, though in many respects unlike that of previous years, has nevertheless been the direct outgrowth of the activities of more than half a century, and it seems but proper, before describing current operations, to speak briefly of the origin and history of the Museum, of its aims and methods, and of its relations to other national institutions, especially the Smithsonian Institution, under whose control it was placed at the time of its formal organization.

#### A.—THE DEVELOPMENT OF THE MUSEUM.

The history of origin and development has been discussed in previous reports, and in a paper entitled "The Genesis of the National Museum."\* It will therefore be sufficient for our present purpose to repeat a few of the most essential facts.

The idea of a national museum in the city of Washington was first suggested by the Hon. Joel R. 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 for four years exceedingly prosperous and active. 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 is aimed, the society became torpid, and eventually, in 1861, passed out of existence.

\* The Genesis of the U. S. National Museum. Report of Smithsonian Institution, Part II, National Museum, 1891, pp. 273-330.

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 storehouse 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.\*

From 1844 until 1858, when the so-called "National Cabinet of Curiosities" passed into the charge of the Smithsonian Institution, the term "National Museum" was not in use. 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 collection, 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 broad plan upon which the operations of the National Museum are now conducted was, however, anticipated as far back as 1853, when Prof. Henry wrote:

There can be little doubt that in due time ample provision will be made for a library and museum at the capital of this Union worthy of a Government whose perpetuity depends upon the virtue and intelligence of the people.†

The difficulties attending the formation of such a museum were appreciated by Prof. Henry, who already in his report for 1849, had spoken with much emphasis of the caution required in assuming under the direction of the Institution the care of the national collections.

Prof. Henry, in the report of the Institution for 1870,‡ again carefully expressed his opinion as to the character which should be given to the National Museum.

There is [he wrote] scarcely any subject connected with science and education to which more attention is given at the present day than that of collections of objects of nature and art, known under the general denomination of museums. This arises from their growing importance as aids to scientific investigation and instruction.

\* Report of Committee on Organization, p. 20.

† Report, Smithsonian Institution, 1852, p. 245.

‡ Report, Smithsonian Institution, 1870, p. 31.

In the report for 1873 allusion is made to the enormous increase in the national collections, "requiring the utmost exertions of the limited force connected with the National Museum for its proper treatment."\*

Although the appropriations for the Museum have of late years been more liberal, it is certain that, on account of the immense annual increase in the quantity of material received, quite as much care and caution is still needed.

The Smithsonian Institution from its foundation fostered explorations, and its Museum was enriched by the numerous ethnological and natural history objects brought home by the explorers. Many gifts were received from private sources, and valuable objects were deposited in its Museum for safe-keeping. The nucleus of its collections was a small but valuable cabinet of minerals formed by the Founder, James Smithson, who was himself a chemist and mineralogist of good repute, and a Fellow of the Royal Society of London.

At the time of the establishment of the Institution several naval expeditions and surveys of the public domain were being organized by the Government, and during their progress large collections of ethnological and natural history objects were made. Important foreign material was obtained by the Pacific Exploring Expedition, Perry's Expedition to Japan, and the other naval expeditions, while the naturalists attached to the Pacific Railroad Survey, the Mexican Boundary Survey, and the surveys under the Army Engineer Corps, brought together great collections illustrating the natural resources and ethnology of North America.

A new source of growth, subsequent to 1871, was the exploration of the waters of North America, by the U. S. Fish Commission, whose connection with the Institution has always been intimate.

At the close of the Centennial Exhibition of 1876 the exhibits of the United States Government, and those of numerous foreign governments and of private exhibitors, came to the National Museum.

A new period now began. The storage rooms and exhibition halls of the Smithsonian building were already overflowing with the accumulations of thirty years, and the small number of persons employed in caring for them were overburdened and unable to do the necessary work. The scope of the collections had become wider and a new and broader classification was found to be necessary. The growth of the country in wealth and culture was leading to the establishment of many local museums, and the educational influences flowing from these and from the Centennial Exhibition caused a demand for more efficient methods of museum administration.

The exhibition of 1876 had been indeed an event of great educational importance to the people of the United States; and not the least of its

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\* Report, Smithsonian Institution, 1873, p. 48.

good works was the lesson 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 large intrinsic value, and were also very important from the fact that the necessity of caring for them led to the erection of a large building for the expansion of the Museum itself.

In 1881, after the new building had been completed, the Museum was entirely reorganized.

In the early years Prof. S. F. Baird, then Assistant Secretary, with two or three assistants, was able to give all necessary attention to the care of the collections, and the Museum was not formally divided into departments.

When the reorganization was made in 1881, under the immediate care of the present Assistant Secretary, the diversity of the collections made it necessary to establish a number of departments, each of which was placed in charge of a curator, and the staff has since been constantly increasing. This is at present composed of the officer in charge and thirty-two curators and acting curators, twenty-two of whom receive no salary from the Museum. There are also eleven administrative offices, each under its own chief, while in connection with the general work of administration there is in the Museum a library, a chemical laboratory, a photographic laboratory, and various workshops for taxidermy, modeling, and for the preparation of skeletons for exhibition.

#### THE DEVELOPMENT OF THE MUSEUM IDEA.

The history of the National Museum may, then, be divided into three periods :—

First, that from the foundation of the Smithsonian Institution to 1857, during which time specimens were collected purely and solely to serve as materials for research, no special efforts being made to exhibit them to the public or to utilize them except as a foundation for scientific description and theory.

Second, the period from 1857, when the institution assumed the custody of the "National Cabinet of Curiosities," to 1876. During this period the Museum became a place of deposit for scientific material which had already been studied, this material, so far as convenient, being exhibited to the public and, so far as practicable, made to serve an educational purpose.

Third, the present period, beginning in the year 1876, within which the Museum has entered more fully into the work of gathering collections and exhibiting them on account of their value from an educational standpoint.

In the first period the main object of the Museum was scientific research; in the second, the establishment became a museum of record

as well as of research, while in the third period is growing up the idea of public education.

In closing this general statement it may be well to mention what seem to be the things definitely accomplished since the time of reorganization in 1881.

The definite steps of progress may be summarized as follows:

(1) An organization of the Museum staff has been effected, efficient for present purposes and capable of expansion and extension as occasion may require, and many capable museum-experts have been trained for work in other institutions.

(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 and arranged in such manner as to insure their safety and make them available for study.

(3) The collections have been increased to more than fifteen-fold their former extent.

(4) A considerable beginning has been made toward the development of a well labeled and effectively installed exhibition series, available for the instruction of the public.

(5) A thorough study of the organization 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 and which will be made available for other institutions through a report upon the principles and methods of museum administration, now in preparation.

(6) Many new methods of installation have been developed by experiment in the Museum, and the best and most available employed elsewhere have been adopted. Our new methods are being adopted in many similar establishments at home and abroad.

(7) The art of taxidermy and the making of museum models have been advanced and dignified by the policy adopted in the treatment of the experts in the employ of the Museum.

(8) Science has been forwarded by the publication of some thousands of papers describing the materials in the Museum, while the work of specialists in the production of these papers has greatly enhanced the value of the national collections.

(9) Popular educational work of unquestionable value has been accomplished by participation in great expositions in Philadelphia, Berlin, London, New Orleans, Cincinnati, Louisville, Madrid, and Chicago.

(10) Hundreds of thousands of named specimens have been distributed to other museums and to colleges and schools.

#### THE POSSIBILITIES FOR THE FUTURE.

It is evident that a National Museum worthy of the dignity of the nation must always be maintained in the city of Washington.

Every country has a museum or group of museums in its capital

city—centers of scientific and educational activity—the treasure-house of the people, filled with memorials of national triumphs in the fields of science, art, and industrial progress.\*

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

Washington may without question be made the seat of one of the greatest museums in the world. It may perhaps be neither practicable nor desirable to gather together in this city extensive collections of early works of art, but a representative series of such objects will undoubtedly grow up which will tend to educate the public taste, and promote the study of the elements of art and the history of civilization, and forward the arts of design. Attention must, however, be directed mainly toward the exposition of the geology and natural history of America and its natural resources, to the preservation of memorials of its aboriginal inhabitants, and the encouragement of the arts and industries of our own people.

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 capitals of Europe the public collections are scattered through various parts of the same city, 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 cooperation between the two organizations, renders them, for all practical purposes, united in interest.

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\* Most of the older nations have museums devoted to their military achievements and triumphs, but our country has no need or desire to enter into this field of work.

Although the appropriations from the public treasury for the maintenance of the National Museum are small, compared with those in several European countries, the value of objects given by private individuals 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 Baird collection of North American vertebrates; 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; the Bendire and Ralph collections of American birds' eggs given to the Smithsonian Institution; the Laccoe collection of fossil plants, 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. It is estimated that within the past fifteen years individuals to the number of at least 2,000 have made gifts to the Museum to the value of \$100 or more.

Almost every day strangers, pleased with the work of the Museum, voluntarily send in contributions more or less important.

The National Museum now contains over three millions of objects.

The late Prof. 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. What was said ten years ago by Prof. Baird is more than true to-day.

One of the most striking features in the affairs of the Museum is the manner in which its collections are increasing. In 1893 the number of specimens is more than fifteen times as great as ten years before.

In the last fiscal year 1,200 new lots or groups of specimens were entered upon the Museum catalogues.

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

As might be supposed, a considerable proportion of the objects given are duplicates of material already on hand, and although these contributions can, with the utmost advantage, be used for distribution to museums and schools, they do not materially increase 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 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 Museum in its present condition may be compared to a book from which pages here and there have been omitted, so that the narrative is disjointed and incomplete.

In certain museums of Europe more money is expended annually in purchases than is represented by the entire appropriations for the National Museum. There are instances even in this country in which more money is expended for the improvement of private museums. The officers of the Museum have repeatedly suffered the chagrin of being compelled to refuse the offer of specimens necessary to complete the collections, and to see them pass into the hands of private institutions in this country or the government museums in Europe. 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.

England is equally liberal toward her other museums. 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 Europe 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.

Our treasures are the result of the activities of an enlightened Government. Through a thousand channels materials for the formation of a museum come into the possession of the Government, and out of such materials our Museum has been built. A museum formed in this manner, however, suffers sooner or later from immense accumulations of objects of certain kinds and from the absence of others. This is true of the National Museum. At the outset no additions were unwelcome, and the expectation that all important deficiencies would be supplied might properly be indulged in. As the years have passed, however, it has become more and more apparent that many of these deficiencies can only be supplied by purchase.

More striking present results might certainly have been attained by limiting the development of the Museum to special fields. We have, however, had in view the future as well as the present, and no object has been refused a place in the Museum which is likely to be needed even in the remote future, in the development of whatever grand museum plans the nation may ultimately be willing to promote.



## B.—ORGANIZATION AND SCOPE.

The National Museum is under the charge of the Smithsonian Institution, and its operations are supervised by the Board of Regents of the Institution.

The Secretary of the Smithsonian Institution is by law the "keeper of the Smithsonian Museum," and the Assistant Secretary, by the usage of nearly fifty years, its executive head.

In the act of Congress passed in 1846 to establish the Smithsonian Institution are contained the following provisions concerning the scope of the museum to be placed under its charge:

1. The act above referred to provides that "all objects of art and of foreign and curious research, and all objects of natural history, plants, and geological and mineralogical specimens belonging, or hereafter to belong, to the United States, which may be in the city of Washington," shall be delivered to the Regents of the Smithsonian Institution, and together with new specimens obtained by exchange, donation, or otherwise, shall be so arranged and classified as best to facilitate examination and study.

2. It provides that, in proportion as suitable arrangements can be made for their reception, these objects shall be delivered to such persons as may be authorized by the Board of Regents to receive them.

3. It provides that they shall be arranged in such order and so classified as best to facilitate their examination and study.

4. It provides that they shall thus be arranged in the building to be inclosed for the Institution.

5. It authorizes the Regents to obtain new specimens, by exchange of duplicate specimens, and by gift, and directs also that they shall be appropriately classed and arranged.

The National Museum thus became the authorized place of deposit for all objects of art, archaeology, ethnology, natural history, mineralogy, geology, etc., belonging to the United States or collected by any agency whatsoever for the Government of the United States, when no longer needed for investigations in progress.

The collections in the Museum are intended to exhibit the natural and industrial resources, primarily of the United States and secondarily of other parts of the world, for purposes of comparison.

The activities of the Museum are exerted especially in three directions:

1. The permanent preservation of the collections already in its possession, which depends chiefly upon the vigilance of the curators and the skill of the preparators.

2. The increase of the collections which are acquired—

(1) From the various Government surveys and expeditions, in accordance with law;

(2) By gift from individuals, from other institutions, and from foreign governments;

(3) By exchange for its duplicate specimens or publications;

(4) By the efforts of officers of the Museum, who make collections

in connection with their regular duties, or are detailed for special service of this nature:

(5) By purchase when appropriations are made by Congress for that purpose.

3. The utilization of the collections, which is effected by exhibiting them to the public, and by encouraging investigations on the part of the officers of the Museum and other suitable persons, and facilitating the publication of the results; also by the distribution to other museums and educational institutions of duplicate specimens, which have formed the basis of scientific investigation, these being identified and labeled by the best authorities.

The Museum by these means fulfills a threefold function:

1. It becomes a *museum of record*, in which are preserved the material foundations of a very great number of memoirs—the types of numerous past investigations. This is especially the case with those materials which have served as a foundation for the numerous Governmental reports upon the resources of the United States. Types of investigations made outside of the Museum are also incorporated.

2. It becomes a *museum of research*, by reason of the policy which aims to make its contents serve as fully as possible as a stimulus to and a foundation for the studies of scientific investigators. Research is a necessary part of the work, in order that the collections may be properly identified and arranged. Its officers are selected for their capacity as investigators as well as for their ability as custodians, and its treasuries are open to the use of any trustworthy student.

3. It becomes an *educational museum*, by reason of its policy of illustrating specimens of every group of natural objects and, so far as it may prove practicable, such other collections as may be found useful for the instruction of the public, which are explained by displaying descriptive labels adapted to the popular mind, and by its policy of distributing its publications and its series of duplicates named, classified, and labeled.

The collections of the National Museum are made up to a very large extent 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. Collections which have resulted from explorations carried on more or less directly under the auspices of the Smithsonian Institution or resulting from explorations carried on by the Smithsonian Institution in connection with educational institutions or commercial establishments.

3. Collections which have been obtained through the courtesy of the Department of State and the cooperation of United States ministers and consuls.

4. The collection of the Wilkes exploring expedition, the Perry expedition to Japan, and other naval expeditions.

5. Collections made by the scientific officers of Government surveys, such as the Pacific Railroad survey, the Mexican boundary survey, and the surveys carried on by the Engineer Corps of the

U. S. Army, and by officers of the Signal Corps of the U. S. Army stationed in remote regions.

6. Collections obtained by the U. S. Geological Survey, the U. S. Fish Commission, and those resulting from the activities of the U. S. Department of Agriculture and other Departments of the U. S. Government.

7. The remnant of the collections of the old "National Institute."

8. 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; the fishery collections displayed by the United States at the International Fisheries Exhibition at Berlin in 1880 and at London in 1883, and the collections obtained from various local expositions, as, for instance, the New Orleans Cotton Centennial Exposition in 1884 and in 1885, and the Cincinnati Exposition in 1887.

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

10. The industrial collections given by numerous manufacturing and commercial houses of Europe and America at the time of the Philadelphia exhibition and subsequently.

11. The materials received, in exchange for duplicate specimens, from museums in Europe and America.

12. Collections received as gifts, deposits, or in exchange, from individuals, numbering usually from 1,000 to 1,500 each year.

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 U. S. National Museum;
3. The Bulletin of the U. S. National Museum;
4. The series of Circulars.

The Proceedings and Bulletins, have in part, been reprinted in the volumes of the Smithsonian Miscellaneous Collections.

Papers prepared by the Museum staff, or based upon the collections, have been printed in every scientific periodical in the United States and in many of those of Europe.

#### 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, 970 in number, which when combined make up over 200 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.

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 forty-two years 1,380,075 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, or 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 of what governments should do for the support of their scientific institutions.

It is surely a legitimate source of pride to Americans that their work in science should be so thoroughly appreciated by other 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, admirably 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 from year to year since 1846—intangible but none the less appreciable—by its constant cooperation 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 anyone 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 37,982 titles were thus added to the national collection of books.

Chiefly through its exchange system the Smithsonian had in 1865 accumulated about 40,000 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 gifts 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 warning given by 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 collections 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.

This condition of affairs will happily soon be remedied.

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 fully half as much as the original Smithsonian 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 Smithsonian 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 a reputable nucleus for a national museum.

The relations of the Museum to the system of popular lectures, for many years established in Washington, which replaces the old Smithsonian courses, once so influential, 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 addi-

tion to this, a large correspondence is carried on with people in search of information on scientific topics. Probably 6,000 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 which 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 received; 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.

Mr. Langley has pointed out that "although by the judicious administration of the Smithson fund nearly \$1,500,000—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, \$911,000, larger now than ever before), it should be remembered that the unrestricted income of the Institution is less than \$50,000 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 contribution for public good, especially if it be borne in mind that, as Mr. 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.

Every museum has its special characteristics growing out of its form of organization, its location, scope, and financial and other resources.

The character of the National Museum is fundamentally affected by its connection with the Smithsonian Institution, its dependence upon Congress for appropriations annually, and the necessity, under existing laws, of its caring for all collections belonging to the Government.

Of the connection of the Museum with the Smithsonian Institution, it should be said that it is in the highest degree advantageous. It should be borne in mind that it is essentially a Smithsonian museum, since, especially in its earlier history, the Institution expended large sums of money in aiding explorations, with the distinct purpose of increasing the collections in certain directions, while of late years it has deposited all the valuable gifts and bequests of specimens it has received. It has had in addition, for nearly half a century, the use of the larger portion of the Smithsonian building, and what is of paramount importance, the guidance and influence of the officers of the Institution, and the very valuable assistance of its numerous correspondents.

### C.—THE WORK OF THE MUSEUM IN PUBLIC EDUCATION.

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. The Museum, however, not only performs these functions, but also does a very great deal to render the resources of science available to the public at large.

Prof. Huxley's definition of a museum is 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 lives are not occupied in the study of science.

In a recent address before the American Historical Association, I attempted to explain the idea of our work as follows:

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

(2) That the public has a right to full participation 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 institutions 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 has greater possibilities in this respect 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, through the distribution of the duplicate specimens in the Museum, which are made up into sets, accurately named, and distributed to schools and museums.

In the next annual report it will be shown 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 also to a very considerable extent directly and personally.

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.

It is much to be regretted that many specialists, intent chiefly upon the study of certain scientific problems in which they individually are absorbed, are disposed to neglect the claims of the educated public to the enjoyment and instruction which museums afford. They do not hesitate to say that scientific museums should be administered for the benefit solely of persons engaged in research. Such men would find no welcome among us.

At a recent meeting of professional naturalists an eminent investigator in natural science publicly expressed his opposition to exhibiting certain scientific collections to "the gaping clowns who form the majority of the visitors to our museums." Such a spirit defeats its own purposes and such a remark deserves rebuke. The experience of Europe with its magnificent educational museums and the history of the several expositions in the United States should be quite sufficient to satisfy any one who has studied the matter, that the museum is an educational power of no slight potency.

The venerable director of the South Kensington Museum, the late Sir Philip Cunliffe Owen, speaking from an experience of thirty-five years, not only in his own establishment, but in the work of building up the score of sister museums now under its wing, located in the various provincial towns of Great Britain, remarked to the writer:

We educate our working people in the public schools, and give them a love for refined and beautiful objects, and a desire for information. They leave school, enter town life, see only dirty streets and monotonous rows of buildings, and have no way to gratify the tastes which they have been forced to acquire. It is as much the duty of the Government to provide them with museums and libraries for their higher education as it is to establish schools for their primary instruction.

In the same conversation, Sir Philip insisted very strongly that a museum not actually engaged in educational work of some kind could not long survive, and as an example of one such field of activity pointed to the great system of lectures and examinations connected with the Science and Art Department of the Council of Education, of which the South Kensington Museum is one of the chief agencies.

## II.—RECENT ADVANCES IN MUSEUM METHOD.

The importance of the Museum as an agency for the education of the young and for the culture and enlightenment of the public in general is each year becoming better understood.

The control of all museums is passing out of the hands of mere caretakers, or showmen, and is being assumed by men of intelligence and enterprise, whose purpose it is to elevate this agency of public culture to a plane of higher usefulness.

Museum-practice has become to such an extent an art that some years of training and experience in a well-organized general museum are almost essential. Intelligence, a liberal education, administrative ability, enthusiasm, and that special endowment which may be called "the museum sense" are simply prerequisite qualifications.

Any museum which employs an untrained curator must expect to pay the cost of his education in delays, experimental failures, and waste of material.

A museum without intelligent, progressive, and well-trained curators is as ineffective as a school without teachers, a library without a librarian, or a learned society without a working membership of learned men.

Such facts as these are gradually becoming impressed upon the public mind, and although the community within which a given museum is located may not for a time concern itself actively about its shortcomings, all the good work which it does is at once appreciated, and if advances are in progress, their results are eagerly awaited.

The "Museums Association," recently organized in England, is doing excellent work in that country. Such an organization is perhaps not yet necessary in the United States, where local museums are so few, but in time one will doubtless be organized. In the meantime the American Society of Naturalists is so situated that it can perform a part of the work proper to such an organization.

Sir W. H. Flower, the superintendent of the British Museum of Natural History, in his address at the last meeting of the "Museums Association" remarked:

Of the museums of the United States of America much may be expected. They are starting up in all directions, untrammelled by the restrictions and traditions which envelope so many of our old institutions at home, and many admirable essays on museum work have reached us from the other side of the Atlantic, from which it appears that the new idea has taken firm root there.\*

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\* Report of the Museums Association, fourth general meeting, 1893, p. 42.

It is gratifying to know that even in the smaller towns of Europe the ideals which we hold before us in our work are appreciated and quoted. The "Brighton Herald" of August 18, 1894, contained the following editorial comment:

All those remarkably constituted persons who maintain that we do not want a museum in Brighton would do well to read a well-written little brochure by Dr. Charles A. White, of the U. S. National Museum, entitled "The relations of biology to geological investigations." It is a philosophical subject, philosophically treated, demonstrating the important relation that museums hold to science and to civilization as centers of learning and conservatories of the evidence concerning acquired knowledge. Museums [he concludes] should not only be made safe treasure-houses of science, but they should be what their name implies, temples of study perpetually open to all investigators.

In our own country the spirit of museum extension is spreading, as is shown by such articles as that by Prof. Morse in the "Atlantic Monthly," entitled "If Public Libraries why not Public Museums," which is reprinted in a subsequent part of this report. It is the highest ambition of the National Museum to be associated actively in the work of museum reform, and to feel that we are standing shoulder to shoulder in this respect with the older institutions of Europe, and that this fact is recognized by them.

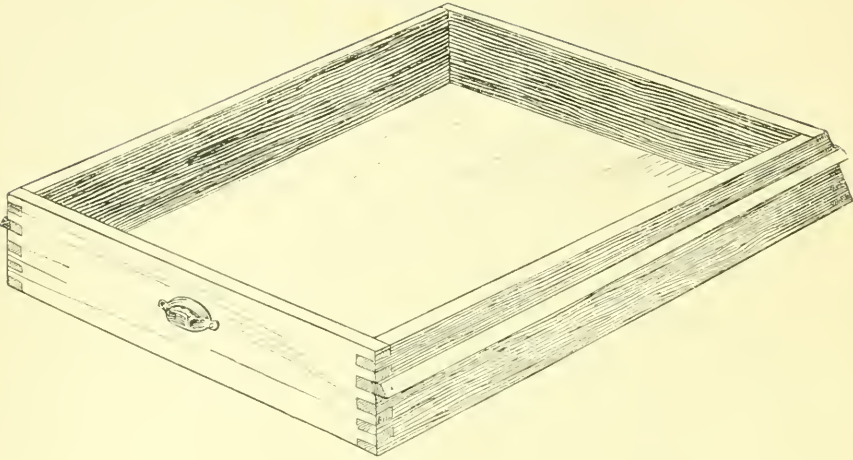
As we have worked along from year to year, always striving to do the best thing possible under the circumstances, we have always taken first into consideration the plans in use in other museums, and have either cast them aside as unavailable, modified them for our own needs, or frankly adopted them.

So it has come to pass that we have a large number of forms of cases and devices for installation, fitted to meet almost every need of museum or exposition administrators. These are always placed freely at the disposal of those who need them. Working drawings and photographs of cases, and samples of fixtures of every kind are freely lent. When the museum has had made, for its own use, expensive tools, such as molds for specimen jars or pedestal tiles, or dies for corrugating metal for the sliding-racks of storage cases, these are placed without charge at the service of public institutions, and the use of blocks for illustrating reports is always accorded.

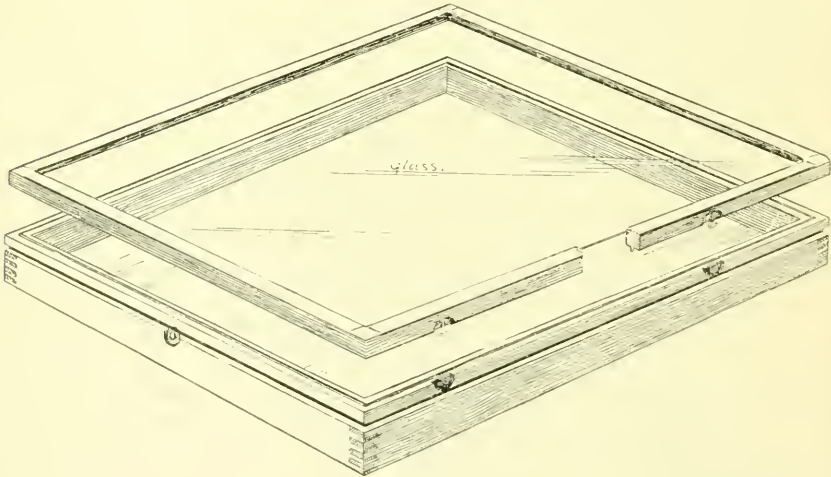
In this way the entire resources and experience of the National Museum are placed at the disposal of even the smallest country museums, and this policy has, we hope, been very beneficial.

In pursuance of this policy some of the most instructive of our recent experiments are described in this report, in advance of a fuller discussion in a comprehensive work on the principles and methods of museum administration, which has been in preparation for some years. This is done with less hesitation because of the example set by Dr. A. B. Meyer, whose papers on the methods of the Royal Zoological and Anthropological-Ethnographic Museum in Dresden have proved so interesting to all museum workers, and who, rightly thinking that museums are doing too much in the way of experiment and too little in utilizing the





1



2

UNIT DRAWERS.

Fig. 1. Storage drawer.  
Fig. 2. Exhibition drawer with glass front ; 24 by 30 inches.

experience of others, publishes his own experiences for the good of other workers in the same field.\*

#### MUSEUM CASES.

Of all the practical questions which confront the museum administrator those relating to the form and construction of cases and the methods of interior fitting are among the most perplexing and, so far as the relationships of the museum to the public are concerned, the most important. Each well-arranged case with its display of specimens and labels is a perpetual lecturer, and the thousands of such constantly on duty in every large museum have their effect upon a much larger number of minds than the individual efforts of the scientific staff, no matter how industrious with their pens or in the lecture room.

Ever since the occupation of our new building very special attention has been given to improving the cases, and a system, peculiar in the beginning to the National Museum, though since adopted by others, has grown up—a system based upon a fixed and interchangeable unit of construction; so that, to a very large degree, it is possible to transfer cases from one department to another. This fixed unit is the storage drawer or "unit drawer," 24 by 30 inches in dimensions (Pl. 1, fig. 1). Modifications and extensions of this unit are very generally in use in many forms of cases, both for exhibition and storage. (Pl. 1, fig. 2.)

*Exhibition cases.*—The various kinds of cases now in use are indicated in a general way in the two accompanying plates. (Pls. 2 and 3.) Fuller descriptions of the cases and their manner of construction will be reserved for a future report. It may be said, however, that the tendency has been toward the use of the very best of glass in the largest possible sizes, the woodwork being, as a rule, restricted to bases, corner pieces, and cornices. The top of the case—no matter what its size—is of glass. When possible, where two panes of glass are used in a single case front, a narrow metal connecting strip is used instead of a wooden bar.

The theory which has led to the development of this form of case is that collections should be so arranged that each surface of glass, or each panel of a long case, stands by itself, its contents being grouped with reference to a general descriptive label, either placed in their midst or in the middle of the case-frame above. It is not considered legitimate to arrange series of specimens on long shelves extending from one end to the other in cases whose fronts are broken by panels or doors; but, as has been said before, each panel or door stands for itself, like the page of a book, the arrangement being without exception from left to right, as in a book.

\* MEYER, A. B. Zweiter Bericht über einige neue Einrichtungen des königlichen zoologischen und anthropologisch-ethnographischen Museums in Dresden. *Abhandl. und Berichte K. Zool. Anth.-Ethnog. Museums Dresden*, 1892-93; Dresden, 1894. No. 1, pp. 1-28, Pls. 1-xx.

The breaking of the view of a specimen or an exhibit by a horizontal bar is also avoided, and when horizontal sash-bars are necessary (as in a cheap case where small panes of glass are used) the situation is relieved as much as possible by placing a shelf behind this horizontal bar, so that it is in effect a part of the shelf.

The form of case with which we are at present best satisfied is shown in the illustrations of some of the groups of Indians. (Pls. 51 and 52.) Where smaller objects are shown, a large proportion of the height of the case is occupied by the base in which "unit drawers" are fitted.

We have also introduced an inexpensive and practical adjustment of the doors of the larger cases, by means of which these may be raised instead of swinging upon hinges, thus doing away with the exceedingly objectionable swinging doors, so undesirable in narrow aisles and so inconvenient to curators. With the new system the cost of the mechanical appliances for swinging the sash is almost compensated for by the saving in hinges, wrench-locks, clamping-bars, and special contrivances for dust-proofing. The general appearance of these cases is shown in the accompanying plate. (Pl. 4.)

So perfect is this adjustment that a glass door weighing more than one hundred pounds may be lifted with one finger. The complicated arrangement of cranks and levers used in many old-fashioned cases is entirely unnecessary.

The advantages of iron and steel exhibition-cases have been urged with so much enthusiasm of late that it seems proper to say that the question of the use of iron has been constantly under consideration here since 1879. All the different forms of iron cases have been studied, including the Dresden cases constructed by Prof. Meyer which were inspected by the writer in 1880, and the wooden-sheathed iron cases in the American Museum of Natural History in New York. This was before the system of wooden cases, which we now use, had been adopted. When the new Museum building was finished, in 1881, the use of iron cases was practically decided upon, and sample cases were made, in general accordance with the Meyer plans. They were found, however, to be much more expensive than wooden cases, heavier, and less easy to adapt to special uses. They offered no material advantage, except, possibly, a greater durability. The limitations of iron in the matter of design are manifest, and the impossibility of securing the polished surfaces of wood, which add so much to the attractiveness of a museum case, was another reason against iron construction.

Looking back fourteen years to the time when iron was rejected, no reason appears for regretting the decision then made.

The use of Mexican or Frontier mahogany which is well known as softer and straighter grained than the West India variety so popular for furniture, has been continued, and no other is so thoroughly suitable, so far as color is concerned, though the oaks when used have, in other respects, given great satisfaction. When black cases are required, cherry wood is employed and an ebony finish added.

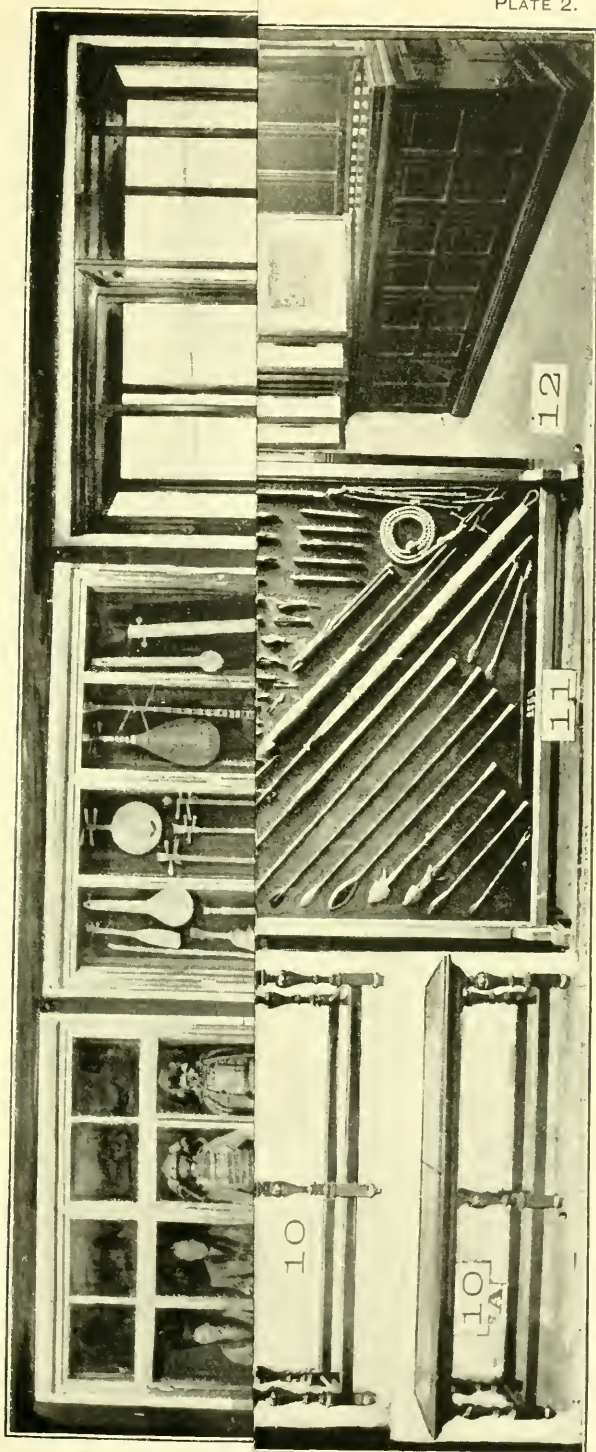




## EXPLANATION OF PLATES 2 AND 3.

STANDARD FORMS OF CASES USED IN THE U. S. NATIONAL MUSEUM.

- Fig. 1. PIER CASE.
- Fig. 2. ALCOVE CASE.
- Fig. 3. TABLE CASE (UPRIGHT).
- Fig. 3A. TABLE CASE (UPRIGHT), HALF SIZE.
- Fig. 4. TABLE CASE (SLOPING).
- Fig. 4A. TABLE CASE (SLOPING), HALF SIZE.
- Fig. 5. TABLE CASE (FLAT).
- Fig. 6. TABLE CASE (GRAY PATTERN), STORAGE BASE.
- Fig. 7. TABLE CASE (GRAY PATTERN), GLAZED BASE.
- Fig. 8. KENSINGTON CASE (GRAY PATTERN).
- Fig. 9. UNIT TABLE.
- Fig. 9A. UNIT TABLE (HALF SIZE).
- Fig. 9B. UNIT TABLE (QUARTER SIZE).
- Fig. 10. BASE TABLES.
- Fig. 10A. BASE TABLES (DWARF SIZE).
- Fig. 11. FLOOR SCREEN.
- Fig. 11A. ARCH SCREEN.
- Fig. 12. TABLE SCREEN.
- Fig. 13. SLIDE SCREEN CASE.
- Fig. 13A. SLIDE SCREEN CASE (HALF SIZE).
- Fig. 11. DOOR SCREEN CASE.
- Fig. 15. CASE TOP SCREEN.
- Fig. 16. HALF COLUMN (FOR WING-FRAMES).
- Fig. 17. GLASS SCREEN (SLOPING).
- Fig. 18. GLASS SCREEN (UPRIGHT).
- Fig. 19. STANDARD BOOKCASE.
- Fig. 20. STANDARD SHELF-STACK.
- Fig. 21. STANDARD PIGEON-HOLE STACK.
- Fig. 22. STANDARD CARD-CATALOGUE DRAWER.
- Fig. 23. UNIT DRAWERS, 2' TO 12' DEEP, 24" WIDE.
- Fig. 24. UNIT BOXES (GLAZED), STANDARD.
- Fig. 25. WING FRAMES (STANDARD).



STANDARD FORMS OF CASES USED IN U. S. NATIONAL MUSEUM.



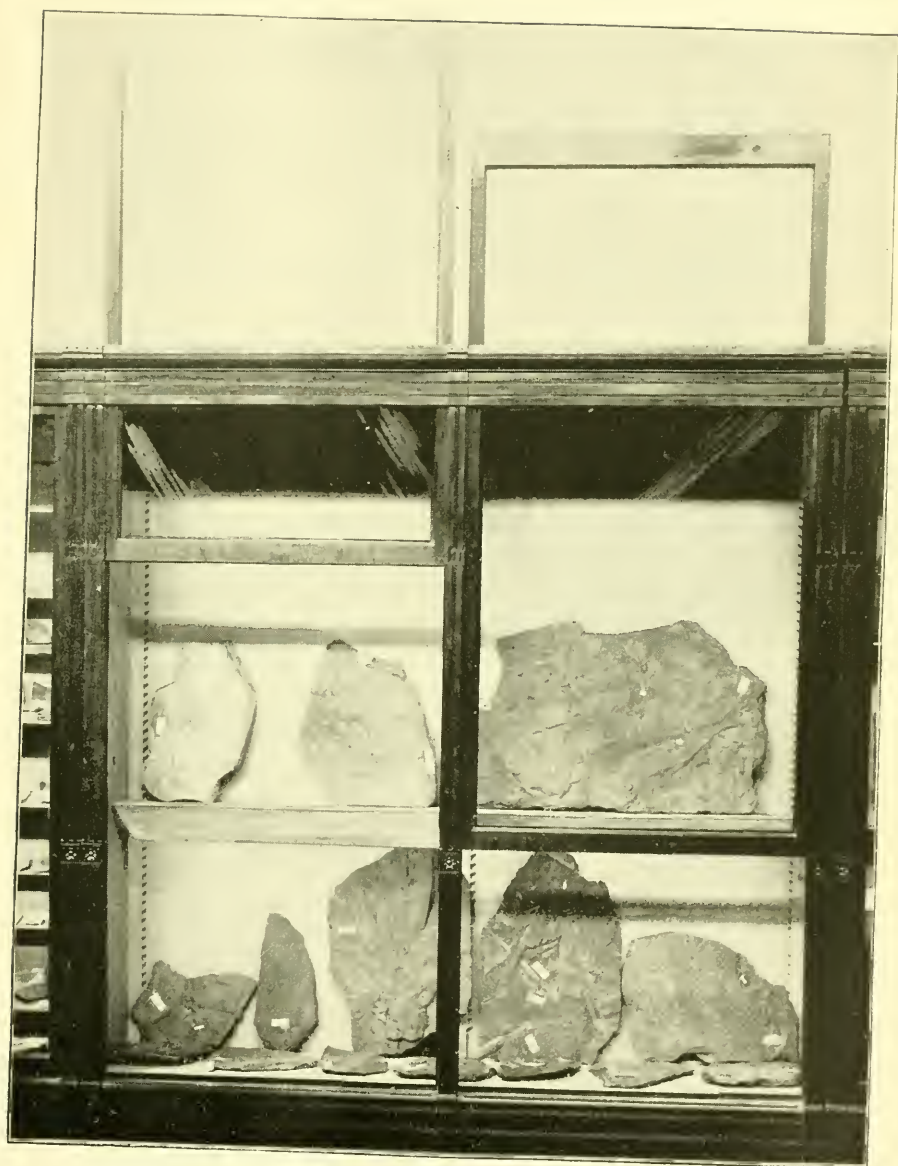
STANDARD FORMS OF CASES USED IN U. S. NATIONAL MUSEUM.



STANDARD FORMS OF CASES USED IN U. S. NATIONAL MUSEUM.



STANDARD FORMS OF CASES USED IN U. S. NATIONAL MUSEUM.



CASE FOR PALEONTOLOGICAL SPECIMENS, WITH SUSPENDED DOOR.  
Size of glass in door, 43½ by 87½ inches.

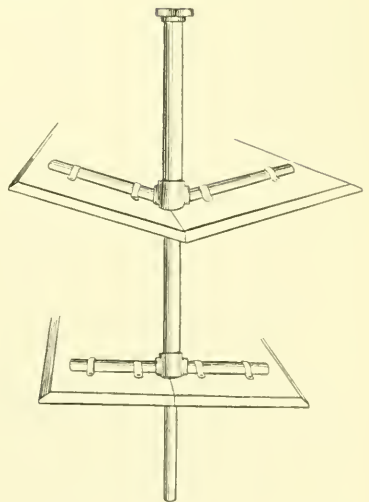
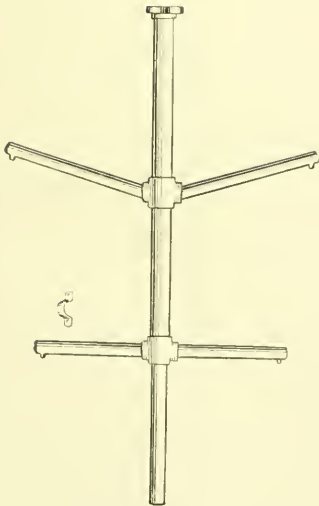
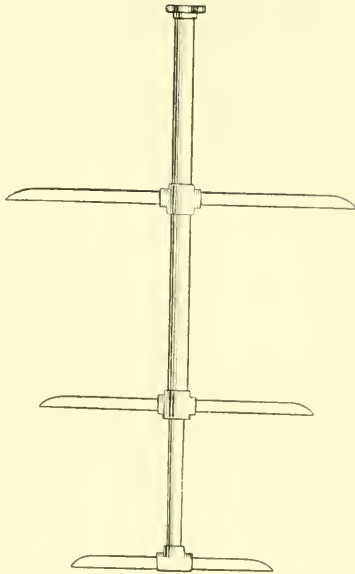
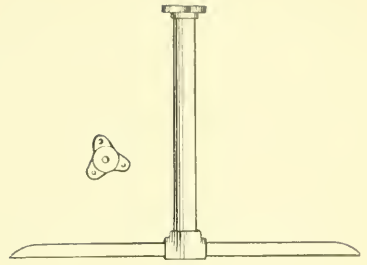
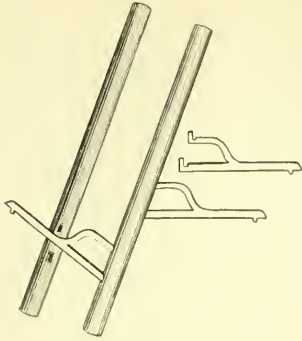






CASE OF PLATE GLASS WITH MOLDINGS REDUCED TO MINIMUM OF POSSIBILITY.  
Size of glass, 17 by 44 inches





BRACKET SUPPORTS.  
(See p. 25.)



Some cases have been made in which corner pieces of wood or metal have been entirely dispensed with, as in that containing the reproduction of the Bryant Memorial Vase (Pl. 5). This ingenious method requires mechanical skill of the highest quality, and the expense is so great that it is only justifiable in the case of very precious objects which require to be hermetically sealed. The cost of this special receptacle was \$395. It is the most expensive case, for its size, in this museum, and is an exceedingly beautiful piece of work.

In fitting cases with shelves the so-called "Gavit bracket," invented by Prof. Edward S. Morse, of the Peabody Museum, in Salem, which is supported upon racks secured to the side, of upright bars, in the back of the cases, has always been thoroughly satisfactory. In some instances where heavy objects, like minerals, are to be shelved and the question of protection against insects is not involved the "Jenks bracket," which fits with a triangular knob into an aperture of similar shape in a metal plate secured to the back of the case, has been substituted.

Another kind of bracket support which seems to have great possibilities is the invention of Mr. Henry Horan. It is constructed of iron pipe and is exceedingly light and strong. The essential features of this contrivance are shown in Plate 6.

The use of clear, strong colors for backgrounds is continued, the only changes having been in the direction of better and purer pigments. Many experiments have been made and the number of colors used have been reduced to two—a maroon corresponding to that customarily seen on the walls of art galleries, for large cases in brilliantly lighted halls where the installation is not crowded, and a light, warm buff, somewhat resembling in tint the Solenhofen lithographic stone, but somewhat warmer, in cases and halls where specimens are crowded or where much light is for any reason desirable. This luminous buff is also used very largely upon ceilings and the upper parts of walls, while the maroon is used on walls up to the level of the tops of the cases, harmonizing admirably with the mahogany furniture. Glass shelves are used when possible, even in cases for natural history objects.

The influence of the National Museum system of case construction and labeling was manifest everywhere throughout the American exhibits at the World's Fair, particularly in the Government building, the Liberal Arts building, the Fisheries building (where Norway also had in part adopted our style), the Woman's building, some of the State buildings, and particularly in the exhibit of the Pennsylvania Railroad, where our cases and labels were adopted under the direction of one of our curators.

*Storage cases.*—A modification of the English form of sliding mechanism, by means of which drawers of different depths are used interchangeably throughout a long series of storage cases, has been in use in the Museum since 1882. At least 30,000 of the standard drawers, 24 by 30 inches, are in use for the reception of minerals, fossils, and zoo-

logical specimens of all kinds, as well as in the departments of ethnology and archaeology.

Besides these there are over 10,000 unit boxes fitted with glass fronts, which also, when necessary, are worked into the same system.

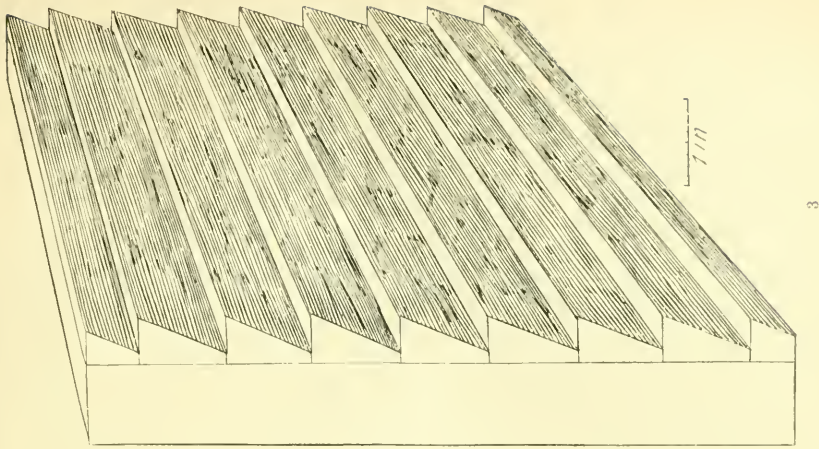
The storage case, from which the idea was originally taken, was, I believe, first invented by Prof. Strickland, of Cambridge, England, and afterwards modified by Mr. Osbert Salvin. As at first constructed in the National Museum, the sliding strips in the storage cases were triangular pieces of hard wood, 1 inch in width and one-half inch wide at the top, sloping to one-eighth inch at the bottom. (Pl. 7, fig. 3.) These were nailed horizontally close together upon each side of the case, while in the grooves thus formed were received the corresponding strips nailed upon the two sides of each drawer—strips originally of the same size but trimmed slightly in order that they might run smoothly.

The top, or thin edge, of the slide-strip was always placed 1 inch below the top of the unit drawer, or 2 inches below the top of the glass-covered unit box, and since the depth of these unit drawers and unit boxes was always an even number of inches, a drawer of any depth could be used, from 2 to 14 inches, and a corresponding drawer of any depth could be placed above or below it. Any compartment could thus be filled with unit drawers of any desired depth.

The first improvement in this mechanism grew out of the desire to secure still greater tightness. The interior of the compartment was lined with zinc, and the strips were nailed on the inside of the zinc. This proved objectionable on account of the nail-holes.

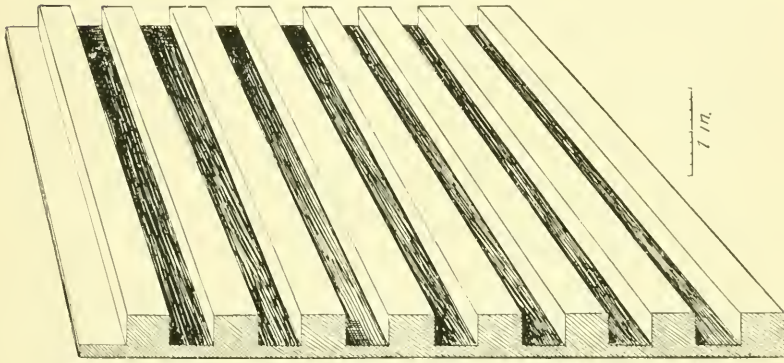
The next step was to make the slide-strips at the sides also of metal, and to accomplish this many experiments were tried, and finally arrangements were made with a firm in Philadelphia engaged in manufacturing corrugated iron. It was necessary for the Museum to have especially constructed a set of dies and rolls for rolling the metal into the desired shape (Pl. 7, fig. 1), and also to import Florence tin of extraordinary thickness, the kind ordinarily used in the United States not being sufficiently strong. This experiment proved satisfactory, and 150 cases of this type have been for four years in use in the Museum, and have stood the test of wear. The only objections arise from the slight roughness where the sheets of tin are joined together, which is not serious, and the fact that the outer ends of the metal ridges, which were of course hollow, had a tendency to bend when the drawers were drawn so far as to make a strong leverage upon the points. This, however, has been satisfactorily remedied by the use of triangular plugs of hard wood, technically called "dutchmen," which are driven into the openings.

Out of these experiments still another form of storage case resulted, in which the metal was placed outside of the woodwork instead of inside, being soldered upon the outside of a substantial framework of wood, while the strips upon the inside were of wood arranged in a new way.



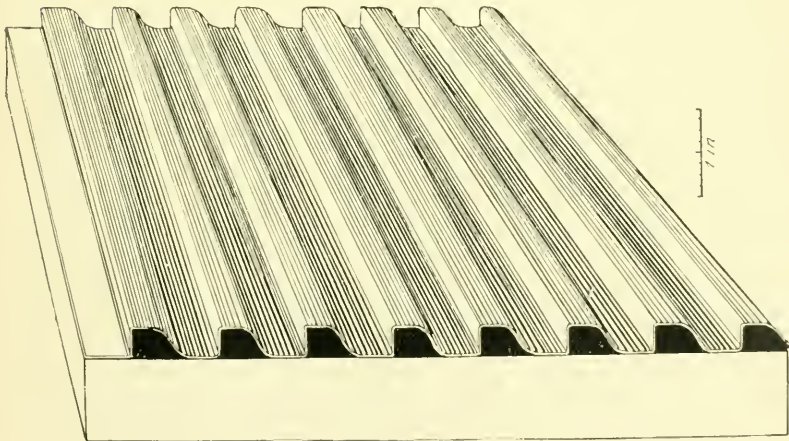
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Fig. 3. Triangular strips.



2

Fig. 2. Grooved strips.



1

Fig. 1. Metal runners.

SLIDING STRIPS TO SUPPORT UNIT DRAWERS IN UNIT TABLE-CASES.





Instead of separate triangular strips, 8-inch boards of oak or ash, one-half inch in thickness, are glued and nailed close together upon the sides of these strips. In these boards are worked at intervals of every half inch grooves one-half inch in width and about one-half inch in depth. (Pl. 7, fig. 2.) The sides of the case are thus provided with a series of parallel, horizontal grooves separated by half-inch bars, which represent the triangular strips formerly described. To correspond to these grooves a new device is employed for the support of the trays. Instead of the strip which was formerly nailed at the side, the lower edge of the tray projects with a triangular section beyond the plane of the sides, as shown in the diagram. (Pl. 8, fig. 1.) This device is applicable to light drawers not over 4 inches in depth. The drawer of the old type, however, works advantageously in the same groove.

In both the metal-lined and metal-covered cases, as just described, a very effective means of closing the front is secured by the use of rubber tubing fastened in a groove in the zinc-covered front edges of the opening, against which a solid wooden door is firmly pressed by means of a special form of combined bolt and lock, as shown in the accompanying sketch.\* (Fig. 1.)

Many improvements have been made in the past ten years, not only in the sliding mechanism, but also in the methods of making the cases moth and dust-proof.

One moth-proof case is a modification of the form originally devised by Mr. William Brewster, of Cambridge, Mass.

The most perfect example of the moth-proof case which has been produced, is one especially modified from designs by Mr. J. S. Goldsmith, for the reception of the type specimens in the mammal collection. This case contains 8 drawers, 3 by 4 feet. Most of the drawers are 2 inches deep, but others of any required depth can be used. The drawers are of pine and have a solid wooden bottom, although one of three-ply veneer would doubtless be an improvement. The system of construction is that already described, with grooved wooden boards inside of a zinc cover. The drawers are provided with the ordinary triangular slide-strips. The frame of the case which supports the slide-racks inside is covered with zinc outside, and is of pine 3 inches wide and seven-eighths of an inch thick. The frame is covered with sheet-zinc, weighing 16 ounces to the square yard. The zinc-covered case, which is 38 inches long, 51 inches wide,  $31\frac{3}{4}$  inches high, is then placed in a case of hard wood, whose dimensions in the clear inside are 2 inches longer and 2 inches higher than the case, which, when pushed into place, fits against the back of the wooden case—the front edge of which projects about  $3\frac{1}{2}$  inches beyond the outer edge of the zinc case—but is separated by seven-eighths of an inch from its sides, bottom, and top. This space is filled by pine strips, 3 inches in width and seven-eighths of an inch in thick-

\* The text figures have been grouped into plates, following Plate 57.

ness, which are necessary for use in connection with the device for dust-proofing.

The device for dust-proofing is dependent upon a double door and a double system of rubber tubing. The system by which the double doors are made is shown in the accompanying sketch (Fig. 2). These doors are separated by an air space of 2 inches. The inner one is of soft wood, paneled, and lined with zinc. The outer one is of hard wood, paneled. The pressure against the rubber tubing, which is necessary for absolute tightness, is secured by three sets of stubs and plates, at the bottom (Fig. 3), and by two bolts, one in each corner above. These are so shaped that, when pressed, they have the effect of wedges (Fig. 4).

The outer door has the same system of stubs and plates, and a rod lock of the ordinary type, fitted with a Yale key for the greater security of the precious contents.

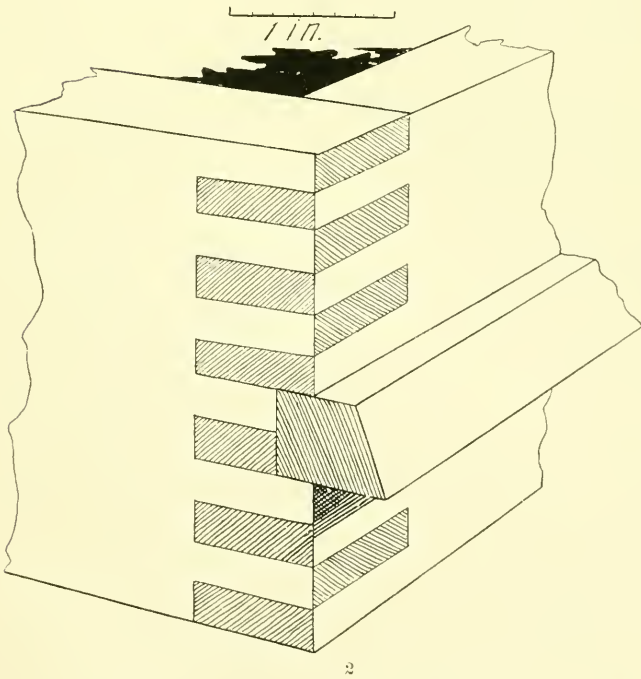
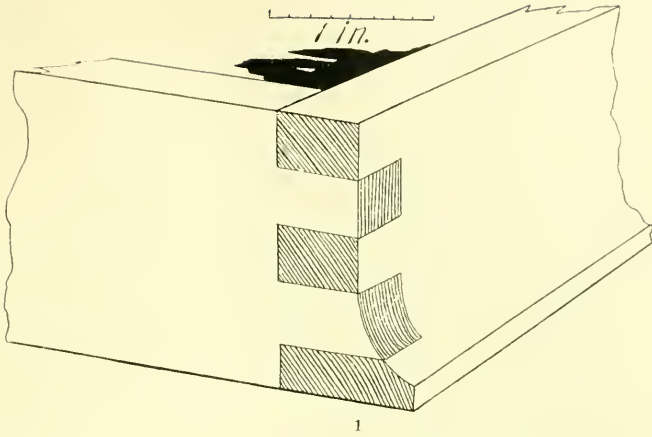
This case has been used for some months and has proved thoroughly satisfactory, being practically air-tight, while its construction is such that it will doubtless be as good fifty years hence as it is now.

Improvements have also been effected in the construction of the unit drawers. At first these were joined at the corners by dovetailing. This proved unsatisfactory, and the device of "fingering" was substituted. (Pl. 8, fig. 2.) The fingered corners have been secured in two ways, one by wooden dowels, the other by the ordinary process of gluing. The doweled trays were exceedingly strong and satisfactory, but it has been more convenient to use the other method and this is now exclusively employed.

The bottoms, which are inserted in grooves about a quarter of an inch from the bottom of the tray, are of three kinds:

- (1) Of pine or of poplar, seven-eighths of an inch in thickness, for the minerals and heavy specimens and three eighths of an inch for light specimens.

- (2) Of "three-ply veneer," such as is used for the seats of chairs and for the lining of cars and in other kinds of cabinetwork. These are made of three layers of very thin, straight-grained wood glued together, the central layer being of pine, the outer layers of ash, maple, or other hard wood. These layers are so adjusted that the grain of the center layer runs at right angles with that of the two outer layers. They are solidly glued together under heavy pressure, the thickness of the whole not exceeding a quarter of an inch. Although somewhat more expensive than the plain wooden bottoms, they are stronger and very much lighter and have the positive advantage of never cracking or shrinking. The plain bottoms, it has been found, often shrink away from their attachments to the sides of the drawer, even when thoroughly kiln-dried lumber is used. Many thousands of "three-ply" bottoms are in use, and they have satisfactorily stood the test of hard use for ten years or more.



DETAILS OF CONSTRUCTION OF UNIT DRAWER.

Fig. 1. Triangular section of unit drawer.

Fig. 2. Corner section of fingered drawer, showing triangular strip on side.



(3) Of paper. This form of bottom grew out of the desire for a lighter and cheaper form of tray.\* In the early storage cases deep drawers were used, chiefly for reasons of economy, and small pasteboard-bottomed trays, four of which covered the bottom of a unit drawer, were used to contain birdskins and other small objects, these being piled one above another in several layers. This was inconvenient and detrimental to the specimens, and the real desideratum proved to be a light shallow drawer of moderate cost, in which specimens could be stored in a single layer. It should be said that the old system of deep drawers was also in part the outgrowth of the necessity for making the drawers themselves dust and moth proof. This was in the days before air-tight cases had been developed, and skins of birds and mammals were kept in glass-covered boxes, similar to the unit box. The development of the light paper-bottom tray was simultaneous with that of the moth-proof case.

In the search for a light and durable drawer of this kind many experiments were made. The first stage was that of binders' board, then followed tin, then light three-ply veneering, then wire-gauze covered with paper, then cotton cloth painted, then cotton cloth covered with paper, and finally the bottom made of paper alone. These bottoms are made only in the Museum workshops, it never having been found possible to get a contractor sufficiently careful to furnish satisfactory drawers. The materials used and the process employed are as follows:

*Materials.*—(1) Brown manila paper, 150 pounds to the ream. The size of each sheet (from which two bottoms are made) is 40 by 48 inches; (2) common flour paste; (3) brown shellac of commerce, dissolved in alcohol.

*Tools.*—The tools are a bookbinder's knife, a broad, flat paste brush, a stout wooden stretcher, 27 by 33 inches, which is the size of the bottom before it is trimmed. This stretcher is of pine, at least  $1\frac{1}{4}$  inches in thickness, in order to resist the strain of the shrinkage of the paper when drying. There should be, of course, a considerable number of these stretchers (Pl. 9, fig. 1).

*The process.*—A sheet of paper is pasted to the large wooden stretcher,

\* The size and estimated cost of the trays with paper bottoms now in use in the Museum and of the stretchers used in making the trays are here indicated:

Department in which used.	Size.	Estimated cost.
	<i>Inches.</i>	<i>Cents.</i>
Mammals.....	24 by 30	25
Do.....	24 by 36	30
Ornithology.....	22 by 28	25
Do.....	28 by 44 $\frac{1}{2}$	30

Sizes of stretchers for making trays with paper bottoms: 27 by 33 inches, 29 by 40 inches, 27 by 33 inches, and 31 by 46 $\frac{1}{2}$  inches.

extreme care being taken to avoid wrinkling, and is then set aside to dry for a half hour or more. It is then taken up again, and another sheet is pasted to it, after which it is again set aside to dry. This is repeated until four or five thicknesses of paper have been joined together, five thicknesses being necessary for the heaviest drawers. Each sheet, before being pasted on, is thoroughly soaked in water. The combined sheets thus forming the bottom of the drawer are then allowed to dry for twelve to twenty-four hours, according to the moisture of the atmosphere. The inside of the bottom of the drawer is then thoroughly coated with shellac. Then, without removing the sheets of paper from the stretcher, they are tacked to the bottom of the frame of the drawer with 6-ounce Swedish tacks, placed about a quarter of an inch apart (Pl. 9, fig. 2). Then another sheet of paper is pasted over, thus covering the heads of the tacks. This not only improves the appearance of the bottom, but prevents the tacks from drawing out. Then the bottom is also thoroughly shellacked, and the edges of the paper trimmed close to the edge of the drawer, which is then complete. The weight of the lightest 24 by 30-inch drawers for small bird skins, 2 inches in depth, is about 31½ ounces, and the cost is about 25 cents.

The ordinary pine storage drawer, 3 inches in depth, costs on the average about 50 cents; a 4-inch drawer, 55 cents; a 5-inch drawer, 60 cents, and so on in proportion. This, of course, refers to prices where a large number of them are made by machinery at the same time.

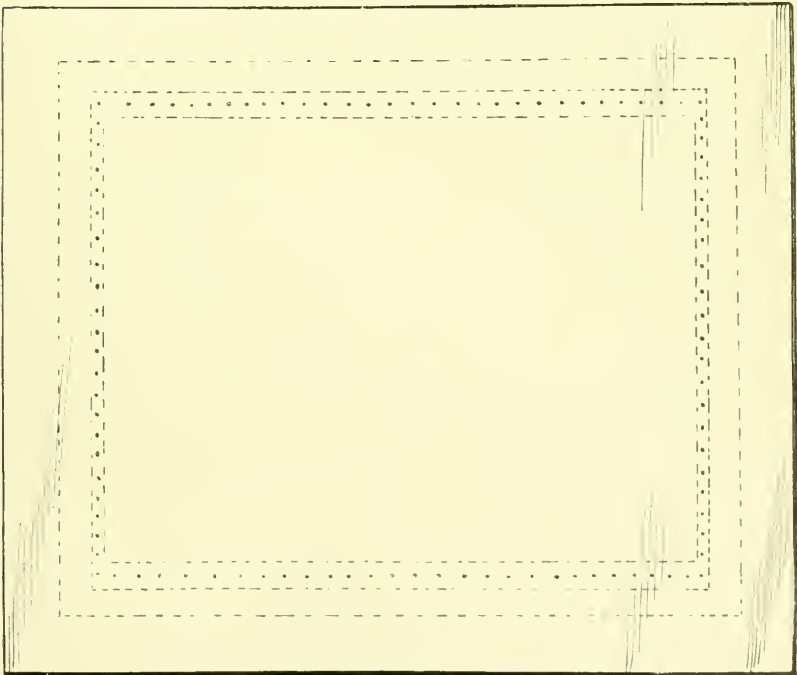
Another feature in our cases, peculiar to this Museum, it is believed, is that every case, no matter how large, is placed upon rollers, or can be lifted from the floor on adjustable rollers of various forms. Even the long wall cases, 9 feet in height, which have been recently constructed, are made in sections, so that they can be moved without the assistance of carpenters.

The largest case in the Museum—that containing the group of buffaloes—is undoubtedly the largest movable show case in the world. It is 16 feet 6 inches by 12 feet 5¾ inches by 11 feet 1¾ inches in dimensions, and the weight of the case, with its contents, is about 9,300 pounds. This is supported on 10 rollers, which are of the kind used on the heaviest rolling platforms in warehouses, and are made of iron, the wheels being 4½ inches in diameter, with rims about 2 inches wide. They are of a pattern called the "anti-friction" castors, the bearing of the axle being upon an arrangement of several wheels. This case can be readily moved from one end of the Museum to the other by eight men.

There are other cases almost as large, and still others—in the mineral hall—much heavier in proportion to their size. The mineral storage case, 8 feet 6 inches long, 4 feet 4 inches wide, and 3 feet 3 inches high, filled with unit drawers, loaded with minerals, has an estimated weight of 2,000 pounds. Such cases as these are supported on 4 or 6 anti-friction castors of the pattern and size just described, one at each corner, and can be moved by four men.



1



117  
2

DETAILS OF CONSTRUCTION OF UNIT DRAWER WITH PAPER BOTTOM.  
Fig. 1. Pine stretcher and drawer (front view).  
Fig. 2. Pine stretcher, showing paper tacked to drawer (back view).





The ordinary lighter type of exhibition case is not provided with independent rollers, but can be raised by wooden trucks with rubber tires about  $4\frac{1}{2}$  inches in diameter, and movable in every direction, like furniture castors. There is an attachment of levers so accurately adjusted that a case full of bottles can be moved from one end of the building to the other without disturbing labels or specimens.

This system of trucks has been found of the greatest service in the exposition work, in which the Museum is often called upon to take part, since the cases can be arranged in cold or bad weather in sheltered, warm rooms, and carried to their places on the floor.

Another form of case especially advantageous for exhibition work is what is called the "knockdown" case, in which the parts are fastened together by pins and escutcheons. These cases have all the permanence and strength of fixed cases, and can be put together and taken apart with great celerity.

#### MOUNTINGS FOR INDIVIDUAL SPECIMENS.

One of the most convenient and ingenious devices is that invented by Prof. Merrill for placing geological specimens, jars, and other similar objects upon sloping shelves, in such a manner that both specimen and label shall be easily seen, while at the same time resting on a level surface; the objects are not in danger of sliding forward. This system is shown in the accompanying illustration. (Fig. 5.)

In the plate referred to (Pl. 10) the appearance of a number of specimens thus arranged upon the shelves is shown, though not well. The arrangement of this case is in many respects one of the most satisfactory pieces of installation which has ever been effected in the National Museum.

Each block or tablet has tacked to its front a small strip of tin, so bent as to receive and hold the label and to allow its ready removal when desired. This is painted the same color as the block, and is thereby rendered quite inconspicuous. To prevent the sliding of the specimens of the front row, which, in order to bring them below the level of those in the back row, are without blocks, a continuous strip of tin is tacked along the front edge of the shelf, bent as shown in the cut. The full width of the strip is the average width of the labels. In this series it is about one inch. The elevation of the back edge, which is to check the sliding of the specimens, is from one-eighth to one-fourth inch, while the front edge is folded over just sufficient to hold the label in place, as before.

Among the other devices which have recently been adopted in the department of geology two may be mentioned:

The first is the curator's plan for showing the appearance of a cave by setting up in its natural position a miniature grotto, with diminutive stalactites and stalagmites, which he was so fortunate as to secure from the Marengo Cave, in Indiana (Pl. 11), placing at the sides of the

case mirrors by whose reflections the general effect of an extended miniature cave is produced. This is a very effective way of mounting exhibits, and the use of the mirrors seems to be an aid to the imagination of visitors, especially to young people who have never seen a cavern.

Another is for storing the great series of microscope slides of thin sections of rocks which belongs to this department. It is thus described by Prof. Merrill:

As it happened, we had in stock a number of pasteboard boxes, some 93 mm. wide, 143 mm. long, and 48 mm. deep, all inside measurements. The dimensions of our standard slide are 48 by 28 mm. By means of two wooden partitions some 3 mm. thick, running lengthwise, each box was divided into three equal compartments, the partitions being held in place by glue reinforced by two small tacks at each end. Heavy manila wrapping paper, such as we also had in stock, was then cut into strips 25 mm. wide and as long as the sheet of paper would allow, in this case about 7 feet. These strips were then bent into a series of folds, as shown in the accompanying illustration, the apices being rounded, not pinched flat. If carefully done, the folds when crowded gently together act as a spring. Two of these folded strips were then placed lengthwise in each compartment, and the slides introduced, standing on end, between the folds at the top. A box as thus prepared readily holds 3 rows of 50 slides in a row, or 150 altogether.

Each slide is separated from its neighbor in the same row by a double thickness of manila paper, which, owing to its manner of folding, acts as a spring, and avoids all possible danger of breakage. When all the compartments are filled, the space between the tops of the slides in any row is but about 2 mm., but there is, nevertheless, no difficulty in removing a slide or in getting at it to read the label without removal, since, owing to the yielding nature of the paper, the top may be readily drawn apart. In this respect the box offers a great advantage over those with rigid compartments, such as are commonly in use. The first box was made merely as an experiment. It proved so satisfactory that, for the time being at least, it is the form adopted for storing the several thousand slides forming the museum collections.

I have attempted to show the arrangement as above described in the accompanying drawing (Fig. 6). In reality the slides are held much more firmly than indicated, since the paper bulges and comes against both the front and back of the slides the full length of the fold, instead of merely at the bottom. It will very likely strike the reader that a better material than paper might be found. I can only state that after considerable experimenting the paper was, all things considered, found most satisfactory.\*

The adoption of unglazed tiles, instead of wooden or paper blocks, to support minerals, shells, and other small objects, is being considered, and experiments, the result of which will be announced later, are being made by Mr. Charles Schuchert, of the Paleontological Department. These tiles are rectangular, and of a soft buff color, corresponding closely to one of the standard shades used in the interior of our cases.

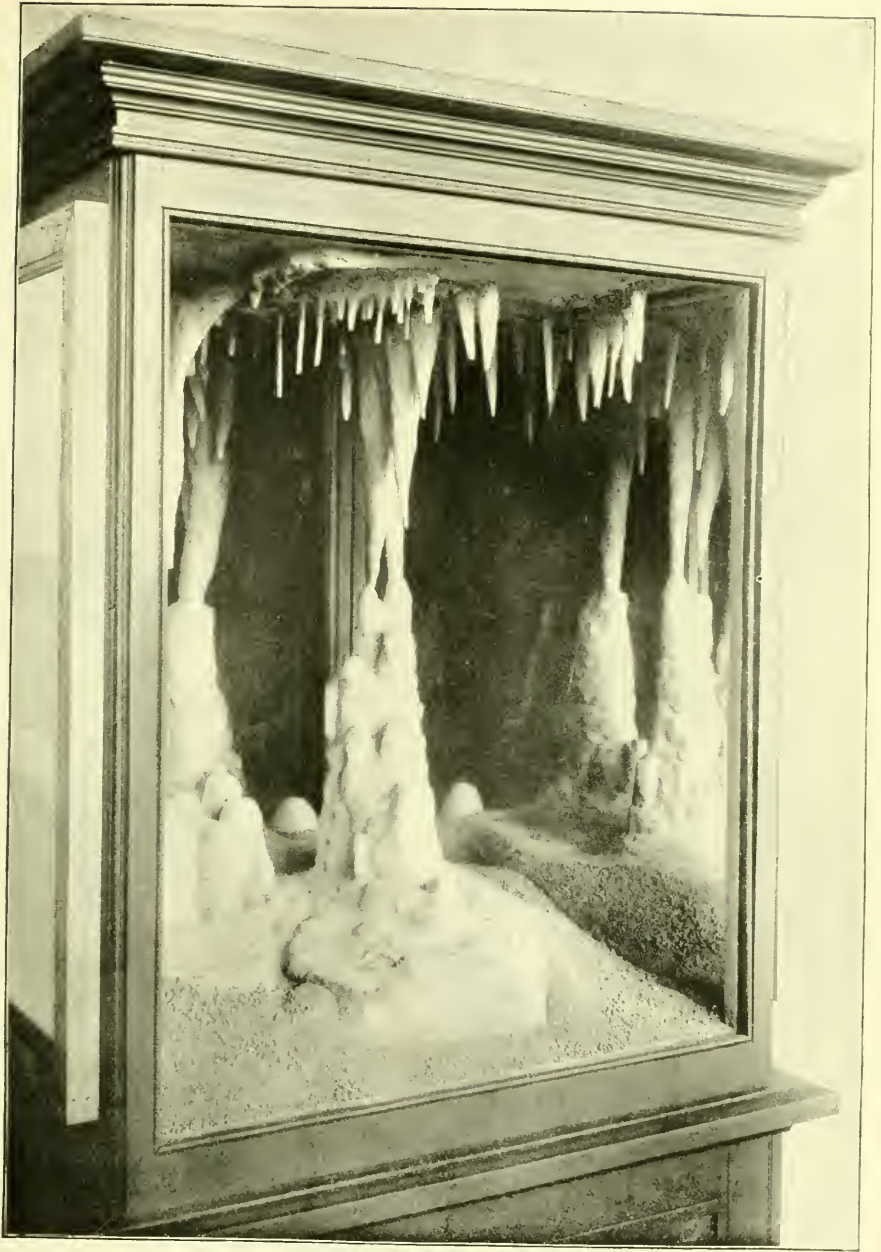
A form of exhibition tray which has been in use for a number of years is provided with a bevel front of peculiar construction, as shown in the accompanying plate (Pl. 12). These trays are covered with black binder's-board, and a piece of colored paper or fabric is placed on the bottom. This form of tray may replace the very objectionable

\* This notice was printed in "Science," November 25, 1892.



ARRANGEMENT OF GEOLOGICAL SPECIMENS ON SLOPING SHELVES.





CASE OF STALACTITES, INSTALLED WITH MIRROR AT BACK.





BLACK PASTEBOARD TRAYS WITH LABEL-BEVELS.





and unsightly pasteboard tray, usually white, which is so often seen in collections of shells, minerals, and fossils. It is particularly well suited for coins and other single objects which it is desired to dignify by placing on a special mount with a pleasing back-ground.

The tray of sheet iron used in the Dresden Museum is much stronger than the pasteboard tray customarily used in other museums, and for large study collections is undoubtedly preferable, although less desirable for exhibition purposes.

For very precious objects, such as small bronzes, ivory carvings, and small examples of metal-work, which lie flat upon the shelves, or at the bottom of table case, our curators occasionally use cushions of maroon or dark blue plush, bound with silk cord; this, however, is a refinement in installation which is not recommended for use except in very special cases, as when it is desired to install a loan or gift collection very elaborately, or when the objects exhibited are of the greatest intrinsic worth. Such cushions may be used to excellent advantage on glass shelves.

#### EXHIBITION JARS.

The necessity for rectangular jars for the exhibition of alcoholic preparations has long been felt, and for many years our people have been in conference with the glass-blowers concerning them; but the difficulties in the way of securing satisfactory results seem almost insuperable.

The most desirable form of rectangular jar—one with a wide aperture of the "salt mouth" pattern—seems to be unobtainable. This is to be regretted, since a jar which can be closed with a circular ground-glass stopper is the most convenient for museum purposes. The plan of a round opening closed by a stopper was proposed, and experiments were made for improving the ordinary type of anatomical receptacle, long in use in this country as well as in Europe, in which the large opening at the top is closed by a flat plate. Such receptacles as this have been used for a number of years in the Museum of Comparative Zoology and in the Army Medical Museum, and they have also long been in use in Europe, both for round and rectangular vessels.

A modification of this device, by Mr. James E. Benedict, is described as follows:

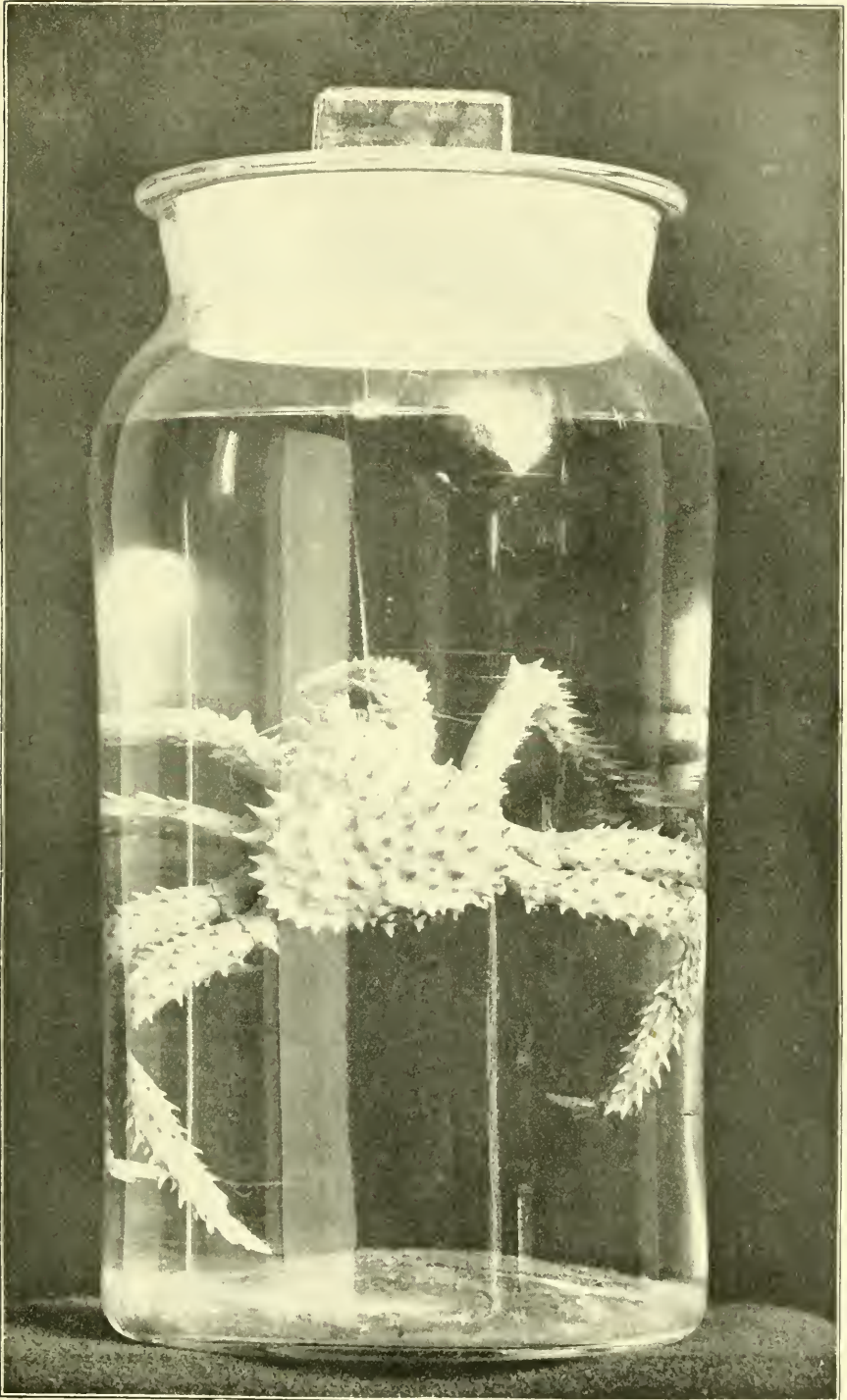
The lip is ground to a perfect plane, and the opening, closed by a sheet of glass annointed with vaseline, is held in place by a cover which just completes the rectangular shape of the jar, its edges filling the shoulder, which is blown on the outer margin of the top of the jar, as shown in the accompanying diagram (Fig. 7). This cap is sufficiently heavy to hold the cover plate in place, and it takes the place of the unsightly mechanical elamps of the jar customarily used in museums for anatomical preparations. The arrangement is thoroughly satisfactory for exhibition purposes, and the cover being made

of common window glass, which is somewhat irregular in its surfaces, enough small openings occur around the edges for the escape of gases, so that the somewhat unsightly vent-hole, usually made in hermetically sealed jars to allow the escape of gas and the introduction of alcohol without removing the luting, is dispensed with.

The most serious difficulty, however, has not been in regard to the cover, but rather in securing at the front of the jar a face sufficiently smooth and well polished to display the specimens clearly and without distortion. Some of the samples made for us by the glass manufacturers had this surface polished on the buffing wheel; but the grinding was not sufficient to remove the inequalities in the glass, and the corners, furthermore, are not rectangular, but rounded to such a degree as to cause some distortion of the specimens. Besides this, these are irregular and unsightly, and even to secure this imperfect result the glass is so thick that its transparency is somewhat impaired. This method of polishing the front surface of the receptacle has been used also in Europe. It is an alleviation but not a remedy for the evil, and, furthermore, is exceedingly expensive and beyond the reach of a museum which has to provide for a large number of wet preparations. Jars of this type, made in Edinburgh, are used in the Army Medical Museum in Washington. The cost of these jars, 9 by 12 inches, at the factory was about \$105 a dozen. A firm in this country tried to produce jars somewhat similar, but was unable to make them at this price.

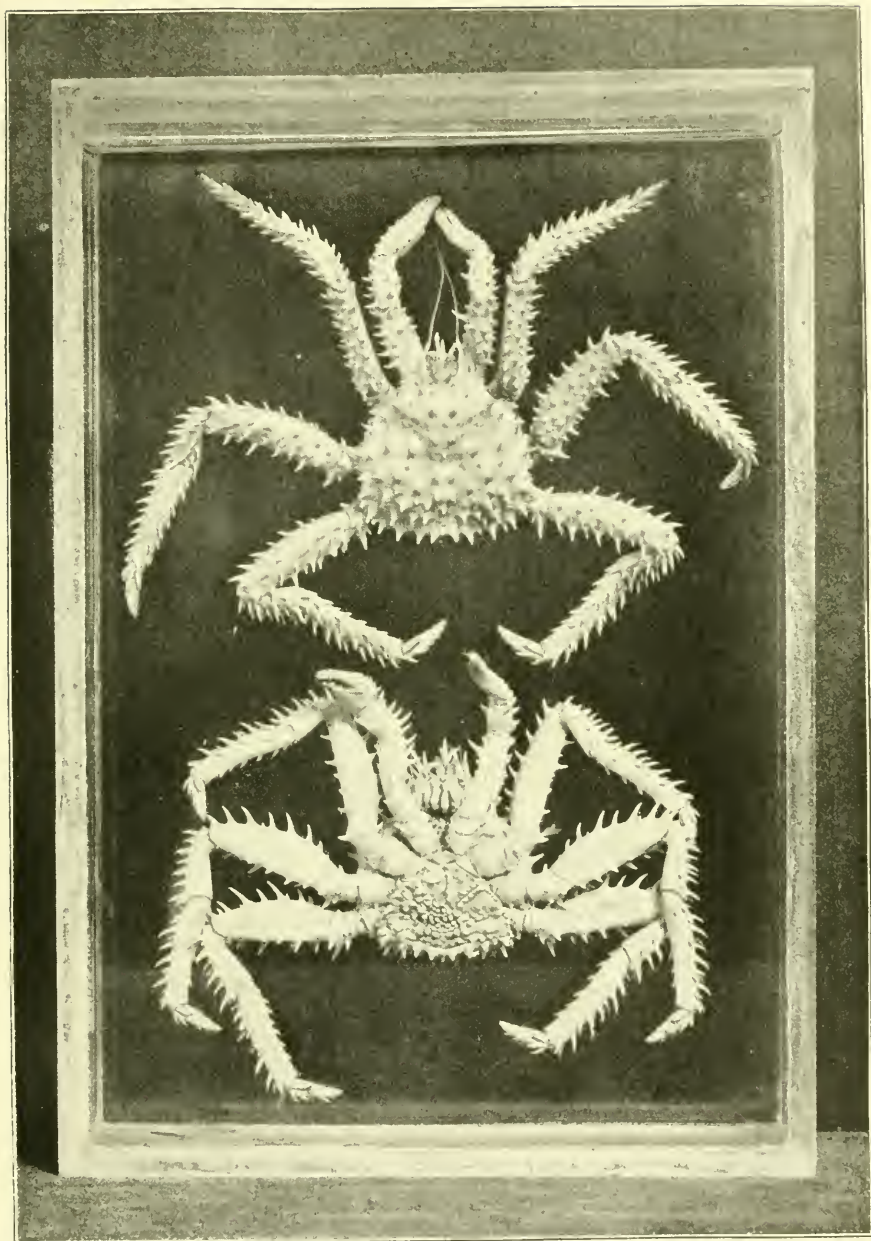
Every important factory in the United States which would undertake work of this class has been consulted, and Mr. Benedict was sent on a special mission to visit them and study in person the possibilities. He soon became satisfied that in the present state of the glass-blowing industry nothing more can be done with blown jars, and began investigations in another direction.

Experiments have been made by Mr. Benedict with a view to the possibility of building receptacles out of plate glass. Something of this kind had already been tried in Germany, with receptacles in metal frames, and constructed on the principle of an aquarium tank. The plan adopted here has been to dispense with entirely metal, and to use silicate cements which are insoluble in preservative fluids, and which unite so closely with the glass as to become, practically, a part of it. The recipes for these cements used are, unfortunately, the property of private individuals. In the process of manufacture the receptacles are exposed to a heat of 350° F. for several hours. It is impossible at the time of writing to say with certainty that these experiments have been successful, although one large jar has been filled with alcohol and specimens for eleven months and twelve others for six months. In jars of this particular form the top is made of two pieces of plate glass, the lower one being smaller, and so attached to the other as to form a shoulder all around; and the cover thus formed is luted to the opening



CYLINDRICAL JAR FOR PREPARATIONS IN SPIRITS, SHOWING DISTORTION DUE TO FORM OF JAR.





SQUARE JAR FOR WET PREPARATIONS, SHOWING ABSENCE OF DISTORTION.



with vaseline. The junction thus formed is so perfect that it is necessary to have a vent-hole in the top, though much smaller than is customary, it being only one-sixteenth of an inch in diameter. Jars made in this way, of the size already alluded to as costing more than \$100 a dozen, can certainly be had for a little more than half the price and, if they prove permanent, will be in every respect better.

Photographs have been made from jars filled with alcohol and specimens, and the peculiarities of the two systems are shown without distortion or exaggeration in the accompanying plates (Pls. 13 and 14).

A small built-up jar, made in Germany, has been in use in the Army Medical Museum and elsewhere as an accessory to the microscope. These jars will hold all liquids and acids used in microscopic work, and careful examination shows that the cement used is subjected to a vitrifying heat. The use of hot water in the jars breaks them in the corners, which make natural lines of cleavage. Just how large a jar can be made in this way we have no information, but some of the experiments tried by us demonstrate that they are not as reliable as those made with cemented corners.

A convenient way of mounting specimens for the rectangular jars is shown in fig. 8. The fish or other object to be mounted is fastened to a pane of common window glass by means of threads passed through the object, ordinarily by the use of a surgeon's needle. These are drawn through holes bored in the glass at the proper places, and fastened by breaking off a soft wooden peg in the hole, biting and fastening the thread in place. The holes are readily bored by aid of a solution of turpentine and camphor used as a lubricant, and a small file as a drill, held in a small drilling machine. Any jeweler's supply store can furnish the requisite material.

#### THE PREPARATION OF LABELS.

The preparation of labels is one of the most difficult tasks of the museum man. The selection of the descriptive matter to be printed requires the best of judgment and the widest and most accurate information; while to determine the form and size of the different labels in a series, and to secure the best typographic effect, is equally difficult, and requires abilities of quite a different order.

A label may contain a vast amount of exact and valuable information, and yet, by reason of faulty literary and typographic arrangement, have as little significance and value as a piece of blank paper.

Before a specialist is prepared to label a collection he must be a complete master of the subject which the collection is intended to illustrate. After he has written the series of labels, if the collection is complete, he will have the material under control which would enable him to write a very complete book of reference upon the subject.

No task is more exacting than label writing. Not only is it impossible to conceal any lack of precise knowledge, but the information must

be conveyed in a terse, concise, and definite phraseology, such as is not demanded in any other class of writing, unless it may be the preparation of definitions for a dictionary. He who writes definitions for a dictionary, however, has usually the advantage of having before him numerous other definitions of the same term, which he needs only to collate and rearrange. A good descriptive label, furthermore, should do something more than impart information. It should be so phrased as to excite the interest of the person who is examining the specimen to which it is attached; to call his attention to the points which it is most important that he should observe; to give him the information which he most needs while looking at the specimen, and to refer him to the books by means of which he can, if so disposed, learn all that is known upon the subject illustrated.

The labels describing the specimens in a collection are intended to take the place of the curator of the collection when it is impossible for him to personally exhibit the objects and explain their meaning. When collections were small and visitors were few, the curator or owner of a cabinet was accustomed, in person, to conduct visitors among the cases, to take the specimens in his hand, to tell their names and where they came from, to indicate features of special interest, and to answer questions.

This was in some respects an ideal way, when the curator was a man of wide knowledge and so much of an enthusiast that he took pleasure in talking without limit. The method was not without defects, however, since the lecturer (for such he was, in fact) selected for exhibition a limited number of objects which interested him, or which he supposed might interest the visitors, and gave the latter no chance for selection. Furthermore, the arrangement could not be such as to convey a sequence of ideas, such as a selected and well-labeled series of specimens can do, and the spoken descriptions, being as a rule full of unfamiliar words, were not remembered. The printed label of to-day may be read over again and again, and is often copied into the visitor's notebook. Again, under the old system, examining a collection was looked upon rather in the light of amusement than of study, and what might have been possible in the way of instruction was rarely attempted.

In these days, when the curator attempts verbal instruction, it is by means of a lecture delivered in the Museum lecture hall, or, if a floor-lecture, among the cases, surrounded by scores or hundreds of auditors, who may either take notes or find the substance of the lecture in some syllabus or printed text-book.

While one visitor might listen to the Museum lectures, tens of thousands pass through the halls without a guide. They must depend entirely upon the labels for information; for guidebooks, if such have been printed, are rarely bought, still more rarely used in the presence of the specimens, and, though often taken home with the intention of



studying them, are only in the rarest instances ever opened after their purchaser has left the Museum.

The function of the label, then, is a most important one, since it is practically only through the aid of the labels that visitors derive any benefit whatever from a visit to a museum.

What has already been said indicates in a general way the office of the descriptive label, and may be expressed more concisely as follows:

The label must—

(1) Tell the name of the object: its exact and technical name always, and if there be one, its common name.

(2) It must call attention to the features which it is important for the visitor to notice.

(3) It must explain its meaning and its relations to the other objects in the series. If it accompanies a natural history specimen, it should explain its geographical distribution, which, if possible, should be plotted on a small map, forming part of the label, and mentioning peculiarities of structure or habit.\*

If an ethnological object, then its uses and construction should be explained, its materials named if they are not obvious, and supplementary information given by means of pictures; and, where pictures are better than words, these may be substituted.

(4) The exact locality, date of collection, and source of the specimen exhibited should be mentioned.

(5) For the convenience of visitors it is well, in many cases, to give the dimensions or weight of the specimen.

The art of label writing is in its infancy, and there are doubtless possibilities of educational results through the agency of labels and specimens which are not as yet at all understood. It is clear, however, that the advice of the negro cook in regard to making soup applies equally well to a good label; to wit, that much more depends on what you leave out than on what you put in. The value of this method of instruction is perhaps better understood by the most advanced writers of school text-books and dictionaries than even by the average museum worker.

In Dr. Edward Eggleston's new "School History of the United States," engravings are plentifully interspersed through the text, as well as in the margins,—portraits, pictures of historical localities, buildings, costumes, and archaeological objects:—and each of these has a label of the museum type, surrounded by rules, and separated from the text with which it has usually only incidental relationship. The originals which are thus illustrated, if brought together would make an admirable

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\* We have used in the National Museum, in years gone by, labels of different colors to indicate geographical sources, and have also used for the same purpose labels with printed borders of different colors. This, however, has long since been abandoned as cumbersome and impracticable. In most cases a word upon the label is sufficient to convey this idea. But when it is desired to convey fuller information, a map has great possibilities, for even the exact range of each species may be shown in this way without materially increasing the size of the labels.

museum of American history, and the book itself could hardly be improved upon as a handbook to such a collection.

The modern illustrated dictionary owes much of its success to the adoption of museum methods, due, perhaps, to the fact that so many men, trained in museum work, have been engaged upon the preparation of the latest American publications of this kind, the Century Dictionary and the more recently published Standard Dictionary. These works impart instruction by methods very similar to those in use in museums, except that they are placed much at a disadvantage by reason of their alphabetical arrangement.

There is, of course, one respect in which the museum exhibition-case has the advantage over the lecturer, who can only present one subject at a time, or over the writer of books, who is prevented by the size of his pages from bringing a large number of ideas into view at once. This difficulty has been in part overcome by the editor of the Standard Dictionary, in the large plates, where are shown, in one case all the principal varieties of precious stones; in another plate, all the races of the domesticated dog, and in another, the badges of orders of chivalry. Even this, however, is far from reaching the possibility possessed by the Museum (with its broad expanses of exhibition cases) of showing a large number of objects so arranged as to exhibit their mutual relationship, and so labeled as to explain the method of their arrangement.

As has already been said, the size and typography of the label are of the greatest importance. The best written label may be ruined by the printer. Not only must the letters be large enough to be legible from the customary point of view, but the type must be pleasing in form, and so arranged as to lead the eye of the reader with pleasure from one line to another, and so broken into paragraphs as to separate from each other the topics discussed.

Furthermore, a system of subordinate sizes of type is essential, so that the most important facts will first meet the eye. In many of the labels shown in the accompanying illustrations type of four or five different sizes is used, the largest giving the name of the object, the next size the name of locality and donor, the next its distribution, and so on, much in the order of importance of the topics already proposed, while the least essential illustrative matter at the bottom of the label is placed in the smallest type. The theory is that the largest type should give the information desired by the greatest number of visitors—by every one; the next size, that needed by those who are studying the collection in a more leisurely way, and so on.

Too much can not be said of the necessity of breaking the descriptive matter into short paragraphs, which should never be more than half a square in length. Where a label of great width is printed, it is our experience that it is better to arrange the matter in two columns, as is shown in one of the accompanying plates, rather than to weary the eye by requiring it to follow back and fro across the card.

## Family CHINCHILLIDÆ The Chinchillas

**L**ARGE or moderate-sized rodents, with elongated hind legs, bushy tails, and long and extremely fine fur.

The family includes three genera, each with a single species—the chinchilla, prized for its fur, the viscacha, one of the most characteristic animals of the South American pampas, and a third species, Cuvier's chinchilla.

The common chinchilla and Cuvier's chinchilla inhabit the Andes of Peru and Chili. The viscacha digs extensive burrows on the pampas.

## THE GREAT AUK

*Plautus impennis* (LINNÉ)

FUNK ISLAND, OFF THE COAST OF NEWFOUNDLAND. 18,117

Collected by F. A. LUCAS.

The Great Auk was formerly common on the coast of Iceland, and found in vast numbers off the coast of Newfoundland, especially at Funk Island.

It formed an important article of food for the early navigators and fishermen. Being incapable of flight it was easily captured on land and was taken in great numbers at its breeding places. Systematic slaughter of the bird for its flesh and feathers caused the extermination of the Great Auk about 1840.

(This skeleton is composed of bones from various individuals)

**C**OVER FOR COFFIN OR ALTAR.  
Made in the 18th century; used in the Russian Church.

PROVINCE OF EKATERINENBOURG, URAL MOUNTAINS,  
ASIATIC RUSSIA. 154.784.

Collected by Mr. GEO. F. KUNZ.



**FOX TRAP (MODEL).---**Wood, with  
cord of vegetable fiber or sinew.

Length, 11 ins. Breadth, 4 ins. Height,  $5\frac{1}{2}$  ins.

BRISTOL BAY, ALASKA, 1882. 55,879.

Collected by CHAS. L. MCKAY.

Used by Tinneh Indians. Consists of a stake-pen closed at one end by a net, in which the fox, becoming entangled and caught, is killed by the hunter who watches from "blind."

**TOBACCO POUCH.---**Made of  
small, various colored glass beads  
closely woven in a regular geometric  
pattern, fringe of similar beads strung  
on variegated worsteds. Suspended from  
neck by a cord.

Length, including fringe,  $5\frac{1}{2}$  ins. Width, 5 ins.

KHUILCHAN INDIANS, ALASKA, 1881. 72,841.

Gift of IVAN PETROFF.

This pouch came from the Khuilchan (*Athabaskan*) tribe of the interior of Alaska; this tribe has no connection with the sea save through the Atwah, or Copper River, natives, from one of whom it was procured in 1881, at Huchek, Prince William Sound.



GROUP OF  
ORANG UTANS OR MIAS.

SIMIA SATYRUS, LINNÉ.

DISTRIBUTION: BORNEO AND EASTERN SUMATRA

This group represents a scene among the trees of a Bornean forest, at a height of about thirty feet from the ground.

The group consists of the following individuals:

Two adult male Orangs (13,962-63), represented as fighting in their characteristic manner.

An adult female (13,965) escaping from her nest, with a nursing babe (13,921) about eight months old, clinging to her body in the position usually adopted when the mother is traveling.

A young male of two years (13,964), represented as aroused from sleep and looking down from his nest.

These specimens were obtained on the Sadong River, Sarawak Territory, Borneo, in September and October, 1878, by the naturalists of an expedition sent to the East Indies by Professor Henry A. Ward.

MOUNTED BY WILLIAM T. HORNADAY.

SUN BEAR.

*HELARCTOS EURYSPILOS*, HORSE.

Malay Peninsula, Java, Borneo, Sumatra

14.332.

Gift of BARNUM, BAILEY AND HUTCHINSON.





## CORNELIUS VANDERBILT.

Copies in bronze of the gold medal awarded by act of Congress January 28, 1864, to Cornelius Vanderbilt "for his unique manifestation of a fervid and large-souled patriotism in presenting as a free gift to the Government" his new steamship "Vanderbilt."

Received from BUREAU OF THE MINT, 1884.

75,302

## POET, SCOTCH.

## WILLIAM DRUMMOND, OF HAWTHORNDEN.

Born at "Hawthornden," near Edinburgh, Dec. 13, 1585; d. Dec. 14, 1649, and buried at Lasswade, two miles from his birth-place.

Descended from an ancient Scotch family of noble blood. Educated at the University of Edinburgh (M. A., 1605), and in Law at Paris and Bruges; a man of wealth and a Royalist, resident at Hawthornden, except from 1625-30, when travelling on the Continent.

A Scotch poet of the Spenserian school,—author, among other works, of *Teares on the Death of Mariades*, 1613; *Poems*, 1616; *Faith Feasting*, 1617; *Flowers of Sion* and *The Cypress Grove*, 1623; and some forgotten historical and political writings.

"DRUMMOND was essentially a follower of Spenser, delighting in the description of outer nature, but, amid all his sensuousness, and even in those lines most conspicuously laden with lustrous beauty, there is a dash of melancholy thoughtfulness—a tendency deepened by the death of his first love. He was so successful as a writer of sonnets that he was called 'the Scottish Petrarch,' and his sonnets are still ranked immediately after Shakespeare's, Milton's and Wordsworth's. His poems are distinguished by pensive beauty, sweetness of versification and nicely-worded descriptions, but lack vigour and originality. *The Cypress Grove*, one of the noblest prose poems in literature, exhibits great wealth of illustration, much fine thinking and an extraordinary command of musical English."

THOMAS GILRAY.

See *Drummond of Hawthornden*, by David Masson, 1873.

**Feast of Tabernacles** (Photograph).—Showing the offering of grace before the meal (known as *Kiddush*, or sanctification) in a tent. The feast of tabernacles takes place on the 15th of Tishri (September-October), and continues according to Leviticus xxiii, 39-43, seven days; most of the modern Jews observe eight days. The important feature of the celebration was the command to dwell in booths, a practice still kept up. In ancient times this feast which was coincident with the harvest time, was the most important of the three pilgrimage festivals.

154,472.

Photographed from the original drawing by permission of the CENTURY Co., New York.



**KORAN STAND** Inlaid with mother-of-pearl. Inscribed with the usual Mohammedan invocation before any religious act: "In the Name of God," and the date A. H. 1210.

CONSTANTINOPLE, TURKEY.

154,757.

The Koran, the sacred book of Islam, is treated by the Mohammedans with great external veneration and reverence. They generally take care never to hold it, and they deposit it upon a high and clean place, and never put another book, or anything else on top of it. When read it is placed on a stand. The reading of the Koran should commence with legal ablution and prayer. The usual prayer is: "I seek protection with God against Satan the accursed," followed by the invocation: "In the name of God the Merciful, the Compassionate." In the services of the mosque it is chanted by the *iman*, or the leader in prayer.

## VOTIVE RELIEF DEDICATED TO CYBELE

(Cast)

FOUND IN ATTICA, GREECE.

Representing the goddess seated on a throne holding in one hand a bowl, in the other the flattened drum or cymbal, with a lion at her feet. Before her stands a woman holding a bundle of twigs, and part of another figure holding an amphora.

ORIGINAL OF MARBLE IN THE ROYAL MUSEUM OF BERLIN.

154,656.

Cybele or Rhea was called the "Great Mother of the Gods." The original home of her worship was in Phrygia, (Asia Minor), in the district afterwards known as Galatia. Her priests were called Corybantes, and her festivals were celebrated with wild dances, and orgiastic excesses amid the resounding music of drums and cymbals. From Asia her worship came to Greece, and at Athens she had a temple called the Metroun, the temple of the great mother.

In Rome her worship was introduced during the second Punic war in 204 B. C. A yearly festival was instituted in her honor (April 2-4) called the *Megalesia*, and under the empire another in March which was celebrated with the observance of mourning followed by the most extravagant joy. In the second century A. D. the festivals *Tairobolia* and *Criobolia* were added.

Among the ceremonies observed in these festivals was a kind of baptism with the blood of bulls and rams killed in sacrifice, with the object of cleansing and bringing about a new birth. The oak and the pine, as also the lion were sacred to her. She was supposed to traverse the mountains riding on a lion, or in a chariot drawn by lions. She is usually represented enthroned between lions, with a diadem on her head, and a small drum or cymbal, the instrument used in her rites, in her hand.



**FIRE-DRILL.**—Used to make sacred fire.  
Lower piece of agave stalk, a soft, pithy wood, with  
harder longitudinal fibers, rendering it a good me-  
dium for the purpose of making fire. Spindle, a  
smaller piece of the same material.

Length of lower piece, 19½ inches; length of spindle,  
18 inches.

ZUNI INDIANS (Zunian Stock), New Mexico.

127,708.

Collected by JAMES STEVENSON.

With this set sand was used by the Zuni in the fire-  
cavity to increase the friction. The fire is preserved in  
a piece of decayed wood. It is the custom of the priests  
to moisten the sticks before beginning to drill out fire.  
This renders the success much more difficult, and there-  
fore more meritorious in the sight of their gods.

**PRINTING BLOCK (Ban-jul-pan).**—  
Wooden block; ends wedge-shaped for  
fitting into a holder. Engraved.

Length, 17¾ inches; width, 8 inches.

SEOUL, KOREA, 1885.

77,018.

Collected by Ensign J. B. BERNADOU, U. S. Navy.

Blocks and movable type are both used in Korea. This is  
a common block for printing the alphabet sheet from which  
children learn the on-moun, or native Korean character. The  
characters are arranged in vertical columns, and above each  
is a rough pictorial representation of something containing the  
initial consonant sound of the characters in the column. The  
writing on the left is astrological.

Satow says, "There are some Korean books dating back  
to 1317 and 1324, printed with movable type."

### HOATZIN.

*OPISTHOCOMUS CRISTATUS* Gmelin.

BERBICE, DEMERARA.

18,518.

Gift of DEMERARA MUSEUM.

The most striking feature of the skeleton, and one peculiar  
to the Hoatzin, is the shape of the breast-bone, the keel  
being cut away in front where it is usually deepest.

The food of the Hoatzin consists mainly of leaves of the  
arum, and as large quantities of leaves are eaten, a large  
crop is required for their reception, and this crop completely  
fills the space below the sternum where the keel is lacking.

The lower end of the furcula (wish-bone) is united with  
the sternum, and its upper ends with the coracoids—the  
bones to which the wings are articulated.

The Hoatzin is the sole member of the order *Opisthocomi*,  
and is probably the representative of a once more numerous  
group of birds of generalized structure.



**SELENITE CRYSTALS.**—From cave in what is locally known as the South Wash, in Wayne County, Utah. 60,881.

Received from J. E. TAIMAGE, 1893.

The crystals occur in a cave which is inclosed by a thick shell forming a mound which stands in relief on a hillside as shown in the photograph. The crystals vary greatly in size and weight, some being over four feet long. Owing to the vandalism of visitors, it has been found necessary to remove the finest specimens to the Desert Museum, at Salt Lake City, to prevent their complete destruction (See Science, Feb. 17, 1893)

**CORRODED STALACTITE.**—The specimen is partially dissolved by the corroding action of water from the roof. It illustrates one of the latest stages in the life history of a cave. The lime in the overlying roof has been so far removed that the water percolating though it is still acid and attacks the material of the stalactites as it drips over them.

ROBERTSON'S CAVE, Springfield, Missouri. 68,186.

Collected by GEORGE P. MERRILL, 1892.

**VOLCANIC DUST.**

VOLCANO OF KRAKATOA, Straits of Sunda. 36,974.

Gift of F. W. HOUGHTON, 1889.

This ash was showered for three days in September, and at the rate of one inch per hour, on board ship Beacons field while in latitude  $0^{\circ} 14' S.$ , longitude  $92^{\circ} E.$ , and at a distance of 855 miles from the source of eruption.

**ORTHORHOMBIC SYSTEM.**

**DISTINCTIVE CRYSTALS ON MATRIX.**

A combination of the Basal Plane (001, 0) and a Brachyprism (120, 12) with a Brachydome (041, 41) and two Pyramids (223, 23, and 111, 1), slightly modified by the Unit Prism (110, 1)

**TOPAZ**

with Albite, Muscovite and Smoky Quartz.

ALABASHUKA, Ural Mountains, Siberia

LEIDY COLLECTION





## COLLECTIONS OF THE BUREAU OF ETHNOLOGY.

**S**TORAGE BASKET (DJELO).—Warp of osiers; weft of the sides of split pine root, weft of the bottom of osiers, both in twined weaving. The weft strands are overlaid with bright straws to form the pattern. Margin strengthened on the inside by a hoop of hard wood.

Height, 3 feet; diameter, 28 inches.

HUPA INDIANS, CALIFORNIA, 1889.

111.433.

Collected by JEREMIAH CURTIN.

After these baskets are made they are filled with hot wet sand to give them a good form. They are set around the wall of the semi-subterranean houses of the Hupas upon a banquette of earth and filled with acorns for winter food. As many as twelve may be seen in one house.

**F**ISHING CANOE (MODEL).—Wood, dug out; sloping sides, slightly flared at top; flat bottom; sharp ends; long overhanging bow, terminating in a point; straight stern.

Length, 22½ inches. Beam, 5¼ inches. Height, including figures, 6 inches

NEAH BAY, WASHINGTON TERRITORY, 1883.

72.907.

Collected by JAMES G. SWAN, Port Townsend, W. T.

Made by MAKAH INDIANS, of Cape Flattery. Perfect in all its appointments, with figures of two Indians seated face to face, the position always taken. Contains two paddles; two fishing-lines complete; two baskets for spare hooks and lines, two clubs for killing fish, five halibut hooks, one bailer, two halibut. None of the objects are made to a scale to compare with the canoe or with each other, the purpose of the Indians being simply to show the various articles without regard to relative size.



### HOMOLOGIES OF THE PRINCIPAL BONES

The series of which this specimen forms a part is intended to show the corresponding bones in the different classes of vertebrates. The spaced skeleton should be compared with the mounted skeleton.

**SKULL OF SHARK**, *Carcharias* sp., an example of the simplest type of cranium. It consists entirely of calcified cartilage, is immovably connected with the backbone, and does not completely inclose the brain. Neither cartilage bones nor membrane bones are developed.

26,164

### THE DOMESTIC FOWL

**THE ANATOMY OF THE DOMESTIC FOWL** as shown on a large scale by the Turkey, *Meleagris gallopavo*, one of the largest of the Gallinaceous Birds.

Model, natural size, by AUZOUX, Paris.

### MODEL

Showing structure of  
**PRECIOUS CORAL**, *Corallium rubrum*.

GREATLY ENLARGED.

- 1 Axial skeleton.
- 2 Friable crust or Cænosarc, in which lie the tubes connecting the body cavities of the individual polyps.
- 3 Individual polyps.



## ECCLESIASTICAL HISTORY AND ART

## COSTUME OF THE MISERICORDIA OF TUSCANY

THIS COSTUME consists of a simple hooded cassock of black, worn over ordinary citizen's dress, and a broad brimmed felt hat, used in outdoor service.

SIENA, 1892.

153,893.

Collected by G. BROWN GOODE.

The FRATERNITY OF THE MISERICORDIA (*Pia Arciconfraternita de Santa Maria della Misericordia*) is a great society, with branches in Siena, Florence, Pisa, and the other cities and towns of Tuscany, which has for its sole object the alleviation of suffering and the furtherance of all works of benevolence. Its most striking characteristic is that its active work is carried on by its members in person, and not by paid deputies. On its rolls are found the names of a large proportion of the adult males of the community, without regard to rank or wealth. A certain number of these are assigned to duty for each day in the year, and are expected to respond at once to any call from the officer of the day, and while on duty are under strict discipline.

The personal relationship of the wealthy and the powerful to the charitable work of the community is productive of much good. All distinctions of rank are ignored in the organization, and to this end a costume of the cheapest material is used, to disguise figure and face, and members while on duty neither speak nor are spoken to, except as a matter of necessity. The money needed for the work is obtained by the mute appeals of the members in public places and at the doors of churches, and from the fees of membership. Each local society has its chapel for funeral services, and all funerals with but few exceptions, are conducted by this organization, the coffin being borne by its members in their peculiar dress.

One of the oldest of these societies, that to which the costume exhibited belongs, is that of Siena. This was founded at the end of the fourteenth century by Bernardino Alizzeschi (San Bernardino) as a society to perform works of mercy and to aid prisoners. In 1564 a statute prescribed the manner in which their charitable offices might be exercised. It was suppressed in the time of Leopold I, and resuscitated by royal permission in 1794. In 1829 it was reorganized upon the model of those in Pisa and Florence, and in 1862 by popular subscription an endowment of 155,000 lire (\$31,000) was secured, which has since been increased by other donations. Its membership is very large, including in a city of fifty thousand inhabitants, about three thousand active members.

Its scope includes everything which comes within the term charity—the relief of those stricken by misfortune of any kind at any time or place. Owing to the precipitous character of many of the streets, horses are comparatively few in Siena, and sick people, as well as coffins, must be carried upon men's shoulders. Invalids are taken by them to the Royal Hospital, three miles from the city, and they have control of an extensive cemetery, in which nearly all interments are made. A group of members is organized under the name of sisters to the sick (*Consolatrici Infermi*). They render aid to the sick at home, supplying them with beds, underclothing, bandages, broths, easy chairs, trusses, and watchers or nurses at night. In summer the Society dispenses mineral water for use in baths, and when necessary, keeps open a room for vaccination and dispenses the vaccine matter throughout the city and the surrounding country. In the case of an accident of any kind, a squad of members is upon the spot to render service, in other communities expedited from the police and board of health.

The administration is in the hands of a brother called the *Procuratore*, who presides at the meetings of the board of management, the *Magistrato*, composed of twelve brothers called *Conservatori*, and also those of the council, composed of eighty councillors (*Consiglieri*). A full financial report is printed each year. The Society has its house, in which is not only a chapel, but a vast warehouse for the accoutres of their work—litters and surgical appliances,—and a great room, surrounded by cupboards, in which the cassocks of the members are kept ready to be put on when they are hastily summoned to duty from their places of business.

The officers of the Society are an inspector (*Ispettore*), who controls the public and private services, a brother deputy (*Deputato*), in charge of the Convalescent's Home, a secretary (*Cancelliere-Segretario*), who supervises the business, archives and correspondence, a treasurer (*Cantariuolo*), and a steward (*Masaro*), who has charge of all linen, furniture, and other property in the warehouse. There are fifty-two officers of the guard, who in turn, day by day throughout the year, supervise the public services, and sometimes as many as three hundred of the members are on active duty in a single day, under the charge of one of these officers. All officers serve gratuitously except the secretary, a physician, two priests, two servants and a letter carrier.



## COSTUMES OF CHINA.

NINGPO BRIDE.---Crimson robe embroidered  
with the dragon.

Gift of CHINESE CENTENNIAL COMMISSION, 1876. 127,561.

When the Imperial family of the Sung Dynasty were fleeing before the Kin Tartars, who carried away the Chinese Emperor Hwaitsung (A. D. 1125) and established a Tartar Dynasty at the mouth of the river Lauetz, the heir apparent, then quite a lad, was for a year or so kept concealed in a private family about a mile and a half from the city of Ningpo. The house is still known as the house of the "yellow gateway." Here he formed an attachment to a daughter of the family, of the same age as himself. The troubles of the times drove him from this asylum but some years afterwards, peace having been made between the Tartar and Chinese Dynasties and the lad having succeeded to the Imperial seat, he sought to find

his youthful love, but she and her family had disappeared and he was never able to find any trace of them. In honor of the memory of his lost love the Emperor ennobled her country women in the department of Ningpo, by authorizing them to wear at their marriage a red robe embroidered with the Imperial dragon. The bride is carried to the house of her husband in a gorgeous sedan chair, with four bearers, preceded, when the family can afford it, by musicians, and men bearing the insignia of office which have belonged to any of her ancestors, and followed by two female servants and by porters carrying hand-barrow with bedding, furniture and other articles. The highest official, when meeting such a bridal procession, will yield the way





# ANCIENT COSTUME OF JAPAN

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Figure of lady of royal lineage in court dress

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PROCURED FOR THE UNITED STATES NATIONAL MUSEUM BY

GENERAL HORACE CAPRON IN 1878

92.426

Order  
**CÆCOMORPHÆ**  
GULLS

Family  
**SULIDÆ**  
GANNETS



Labels, as a rule, seem to be most satisfactory when nearly square, or with the height less than the width.

The relationship of the objects in a series to each other may usually be indicated by the size of the labels, which should be uniform for objects of the same general character in the same case. When a deviation from this rule is necessary, if the size of the type remains the same, more space may be obtained either by slight widening or slight lengthening; but in the same series we must always lengthen or always widen. Classification labels, which are placed, unattached, among the specimens, increase in size with the importance of their grade in the plan of classification, as is shown in the family labels illustrated.

There are limits to the possibilities of making labels speak by their size. An object on the top of a case, or on a pedestal, or in a case by itself, is always regarded as "out of classification," and its label arranged solely with reference to its appearance or utility in the place where it is to stand. It is also necessary to vary the size somewhat in the same series, when, as in a long case of mammals, a small species and a large one are placed side by side. Here, for æsthetic reasons, the rule of uniformity is usually set aside.

Much attention has been given to the selection of type and color for labels, it having been found that labels printed on white cardboard become dirty or turn yellow, besides being dazzling and hard to read. Many tints of cardboard which would otherwise be available may not be used, because of their tendency to fade—objectionable in itself, and doubly objectionable when it becomes necessary to put a fresh, bright label by the side of one which has become faded in use. Almost every sample of colored board which has been tried in the National Museum has faded after a time. The most satisfactory has been one of greenish gray. This is temporarily in use in the geological and mineralogical collections, where a light gray color for the interior of the cases and shelves seems preferable, and also in the collection of birds, which is installed by preference in a somewhat dark apartment.

The standard label-board, however, is a rough-faced manila. The color, being that natural to the fiber, is quite unchangeable. There is no fading, little tendency to become dirty, and its soft, rich, brownish-yellow tone sets off admirably the heavy black lines of the antique-faced type which is used, and harmonizes well with the buffs and maroons which are our favorite colors for case interiors. The material at first used was a somewhat soft though thick paper, made specially for gem-covers in the herbarium. This did not prove thoroughly satisfactory, since the labels, unless very small, had to be glued or tacked to some solid support to prevent their bending and winding, and even then the corners frequently rolled.

We now have a special cardboard of the material just mentioned, heavily pressed, very stiff, and durable, which, though its surface lacks somewhat the desirable softness, proves very satisfactory.\*

\*Samples of this board will be sent to any museum worker who may request it.

It may be added that cartridge paper, such as is ordinarily used for wall decoration, in any tint of gray or light brown, is an admirable material for labels, especially large ones. It must, however, be glued to a tablet. If this is made of dark wood with a bevel retreating from the edge of the label, forming a dark border, the effect is very pleasing. Labels thus prepared, and mounted upon metal rods, are used by us for general classification labels in the interior of cases.

It is the plan in the National Museum to have a large label, glazed and framed, at the top of each case, or in front of each panel. These are printed on black or maroon paper in gold or silver letters.\*

The labels in gold on black are printed from large wooden type, and are used to indicate the general system of classification of the cases upon the floor. When it is desired to use outside labels, glazed and framed, which are not in this general-classification series, we print with heavy-faced type in black upon manila or cartridge paper, such as have been already referred to, since the black upon yellow is more legible with comparatively small type than the gold upon black.

The National Museum owes many most important lessons in the matter of labeling and the interior fitting of cases to the Art Museum at South Kensington. Their system was studied with the greatest care by the writer in 1880 and during a residence of seven months at South Kensington in 1883, and, as will be evident to anyone who knows their system, its influence has been very great upon that in use in Washington.

In the accompanying illustrations (Pls. 15-26) are shown a number of the forms of labels adopted in the National Museum. Others are being developed from day to day; but it is thought advisable to place these upon record as an indication of what has already been accepted as measurably good.

#### ADVANCES IN GENERAL INSTALLATION.

The map devised by Mr. Merrill to show the extent and location of the great ice sheet in North America during the glacial period is described further on in this report.

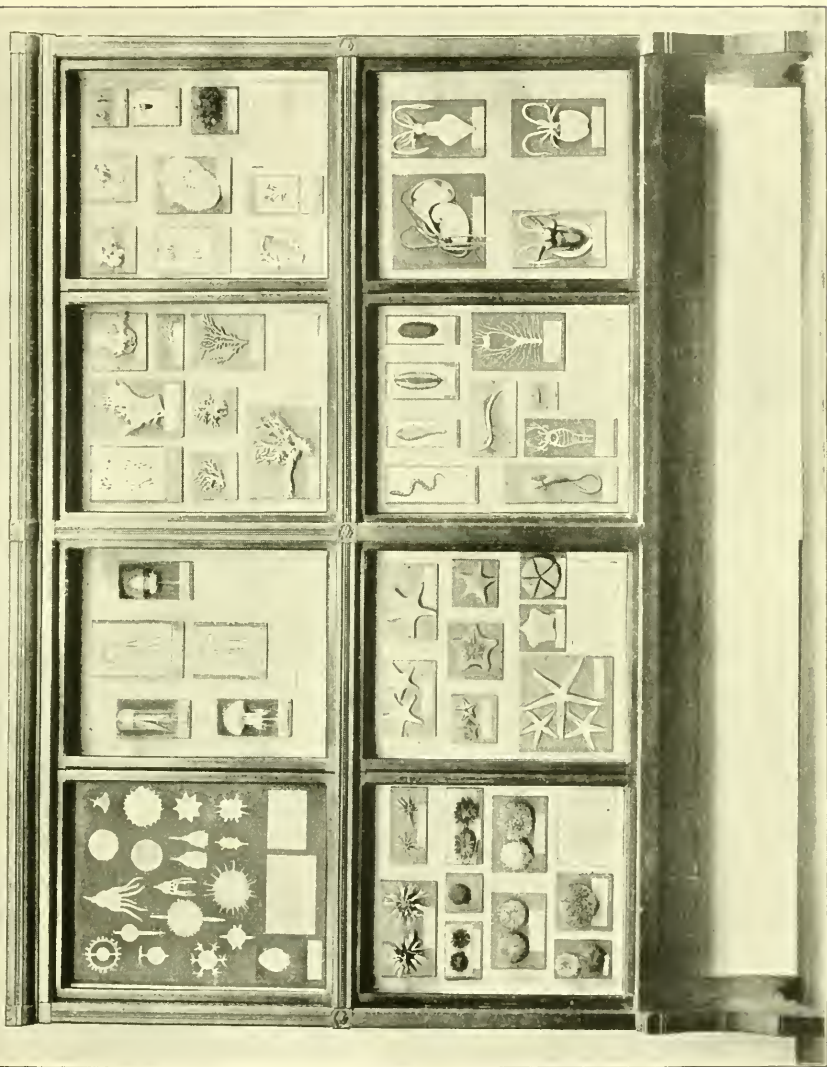
The synoptical collection of invertebrates prepared by Mr. Lucas also marks a positive advance in methods of mounting and labeling, to say nothing of the success attained in showing the structure of certain representative forms. This work will be described in the report for 1894, and a mere mention must now suffice.

The accompanying illustrations (Pls. 27, 28, 29), however, tell the story better than words can do.

We have adopted two ideas already well carried out in the British Museum of Natural History, and original with its director, Sir William Flower, to whom we are indebted for other ideas equally good, soon to

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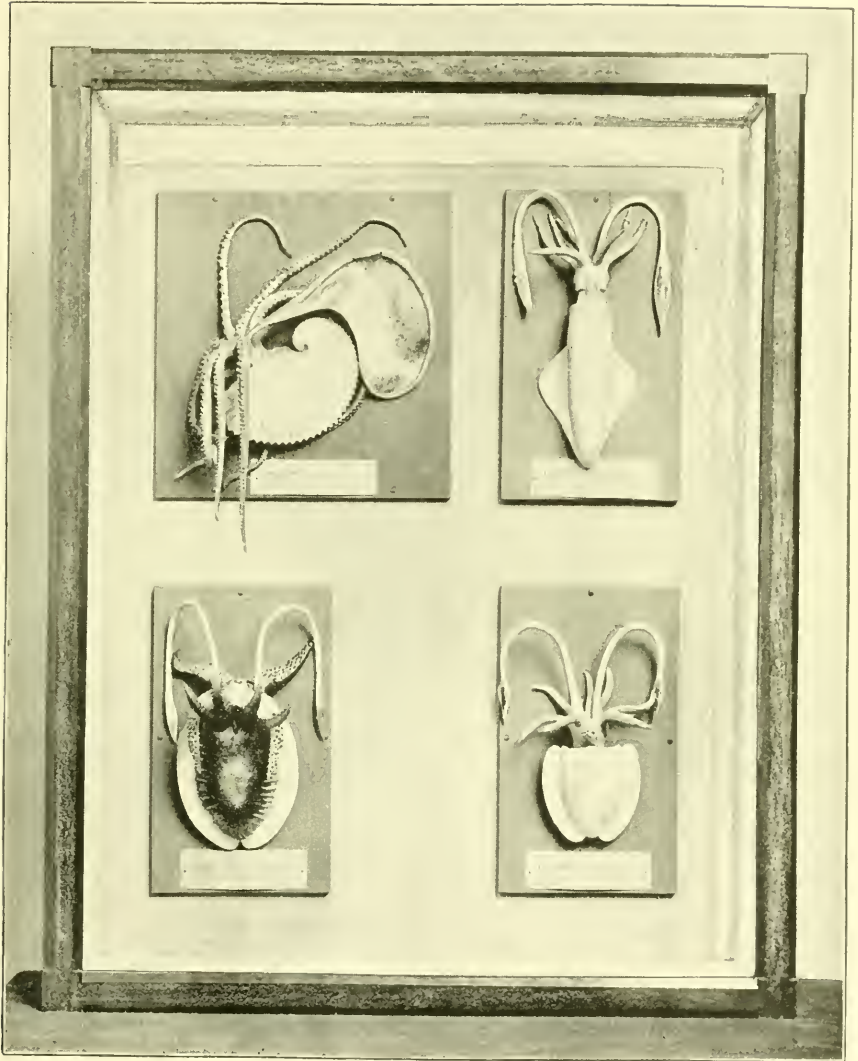
\* To produce silver letters, size is used instead of printer's ink, and nickel powder is applied before the size is dry. The nickel is unchangeable and very effective.



UNIT SLIDE SCREEN HAVING EIGHT GLASS-COVERED UNIT BOXES, CONTAINING SPECIMENS FROM THE SYNOPTIC SERIES OF INVERTEBRATES.

The boxes are 24 by 30 inches, outside measurement.





GLASS-COVERED UNIT BOX CONTAINING MODELS OF CEPHALOPODS.  
Size of box, 24 by 30 inches, outside measurement.







GLASS-COVERED UNIT BOX, CONTAINING MODELS OF MARINE WORMS.  
Size of box, 34 by 30 inches, outside measurement.



be materialized in Washington. One is the exhibit of skeletons of man and horse (Pl. 30), shown side by side, with the homologies of the bones indicated by a parallel system of labeling, the other the mounting of the races of domestic pigeons in one case upon a stand in the form of a dovecote, the specimens being so arranged as to show their relationship to each other and to the parent form, the rock dove.

A similar project is being worked out for the domestic fowl, but is not yet in final shape.

Another advance is that effected by Mr. Lucas in showing, side by side, all the principal variations of the vertebrate skull, the homologies of the bones being indicated by a system of coloration modified from that already in use in the Natural History Museum in Milan, Italy.

A minor feature which seems to add materially to the comfort and convenience of many visitors is the reading table, a sketch of which is here given as a substitute for a detailed description (Fig 9). There are some thirty of these tables, one for each department, and about 500 books are thus placed at the service of visitors. The books on the tables are text books, bibliographies, dictionaries, and standard works of reference, and each table is devoted to the subject illustrated by the special collection in the midst of which it stands. In the rotunda is a bookcase containing cyclopedias, and visitors who desire fuller information are at liberty to go to the Museum library, and thence, if need be, to the sectional libraries in the curators' laboratories.

It is pleasant to be able to say that although over a thousand volumes are thus exposed without surveillance in the public halls, not a single volume has been stolen, though many of them have been "read to death."

#### TAXIDERMISTRY IN THE MUSEUM.

Allusion has been made from time to time in the reports to the work of the Museum preparators in preparing objects for exhibition or study, and the time seems now to have come for a consideration of what has been accomplished and how this has been done.

As early as 1875, when, by means of the appropriations for the exhibit of the Museum at the Centennial Exhibition at Philadelphia, it became for the first time possible to employ competent taxidermists, an effort was made to secure the very best men available, and to have prepared better specimens than were at that time to be found in any American museum. Mr. Joseph Palmer and Mr. Julius Stoerzer, excellent workmen of the old school, were the chief agents in the preparation of the exhibit of mounted animals and casts shown in Philadelphia, and the results, though, so far as accessories are concerned, far below the present standards, were in many instances quite equal to what has since been done, as is indicated by the accompanying plate of the group of fur seals (Pl. 31). Their work was greatly admired, and the influence of the movement then just beginning soon spread to other institutions.

The ideals in the National Museum were as high then as at the present time, and Professor Baird, himself a very skillful taxidermist, was not only the best of critics, but enthusiastic in the extreme upon the whole subject. The time of preparation for the Philadelphia exhibition was so short and the appropriations so limited, however, that it was not possible at that time to accomplish the results desired.

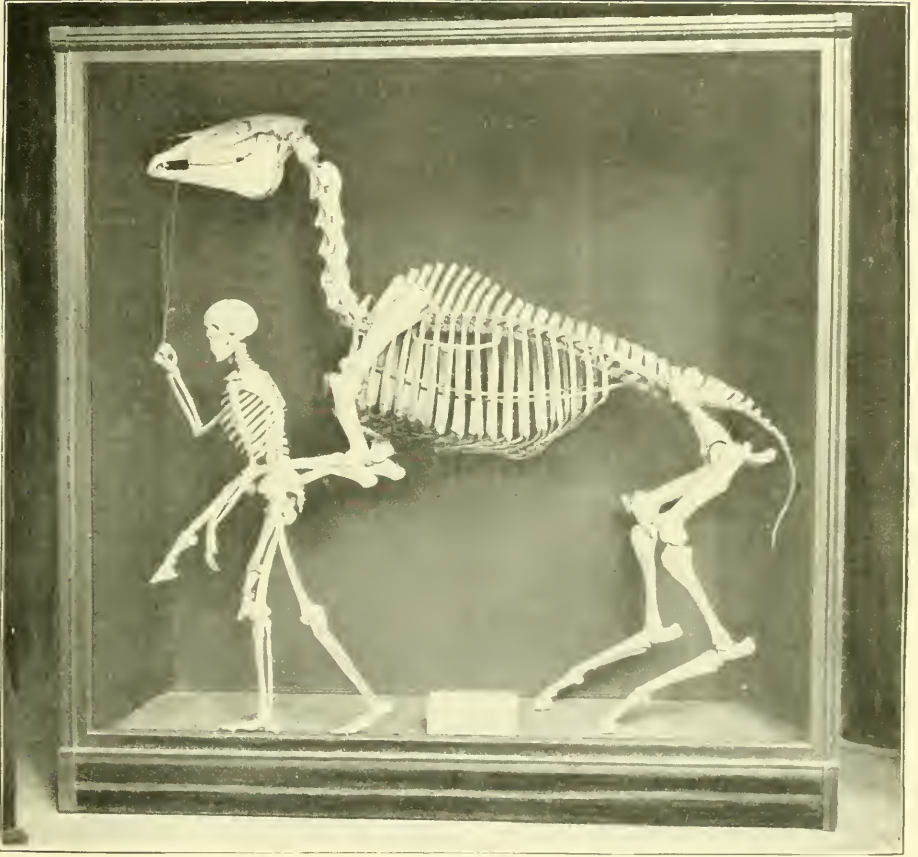
In this same connection should be mentioned the very important influence of Prof. Henry A. Ward, who, in the conduct of his natural history establishment at Rochester, was always evidently actuated quite as much by a love for natural history and the ambition to supply good material to museums, as by the hope of profit, which was always by him subordinated to higher ideals in a manner not very usual in commercial establishments.

While the work from 1875 on was constantly advancing in Washington, and the antiquated and badly prepared specimens in the old collection were being replaced as fast as possible by others as good as could at that time be prepared, similar agencies were in activity in Rochester, and under the influence of Prof. Ward a number of enthusiastic young men were brought together and employed in the various branches of the work connected with the establishment. It was here that, through the stimulus of association and in connection with the immense work in preparing natural history specimens which was then in progress, mental forces of another kind came into being; and here, in 1879, and the years following, some very remarkable pieces of work were accomplished, which for originality and strength far surpassed anything hitherto attempted in America. Among these may be mentioned Hornaday's groups of oranges, one of which is now in the museum in New York, and another here in Washington. These, though lacking in the artistic repose which characterizes some of the later productions of himself and his pupils, were extremely spirited and had all the qualities of good workmanship and permanence which could be desired.

A series of animals of the Rocky Mountains, mounted by Mr. F. S. Webster to serve as models for the artist Bierstadt, and since destroyed by fire, should also be mentioned in this connection. Work of this kind demonstrated the triviality and false ideals of such ambitious figure groups as those of Verreaux, of which certain examples had reached this country and were up to that time greatly admired, and of the work of the European school of mammal taxidermists in general, well typified in the celebrated Wurttemberg collection and in many of the groups in the Liverpool Museum. It is not intended, however, to disparage the very excellent work of Verreaux upon single specimens\*

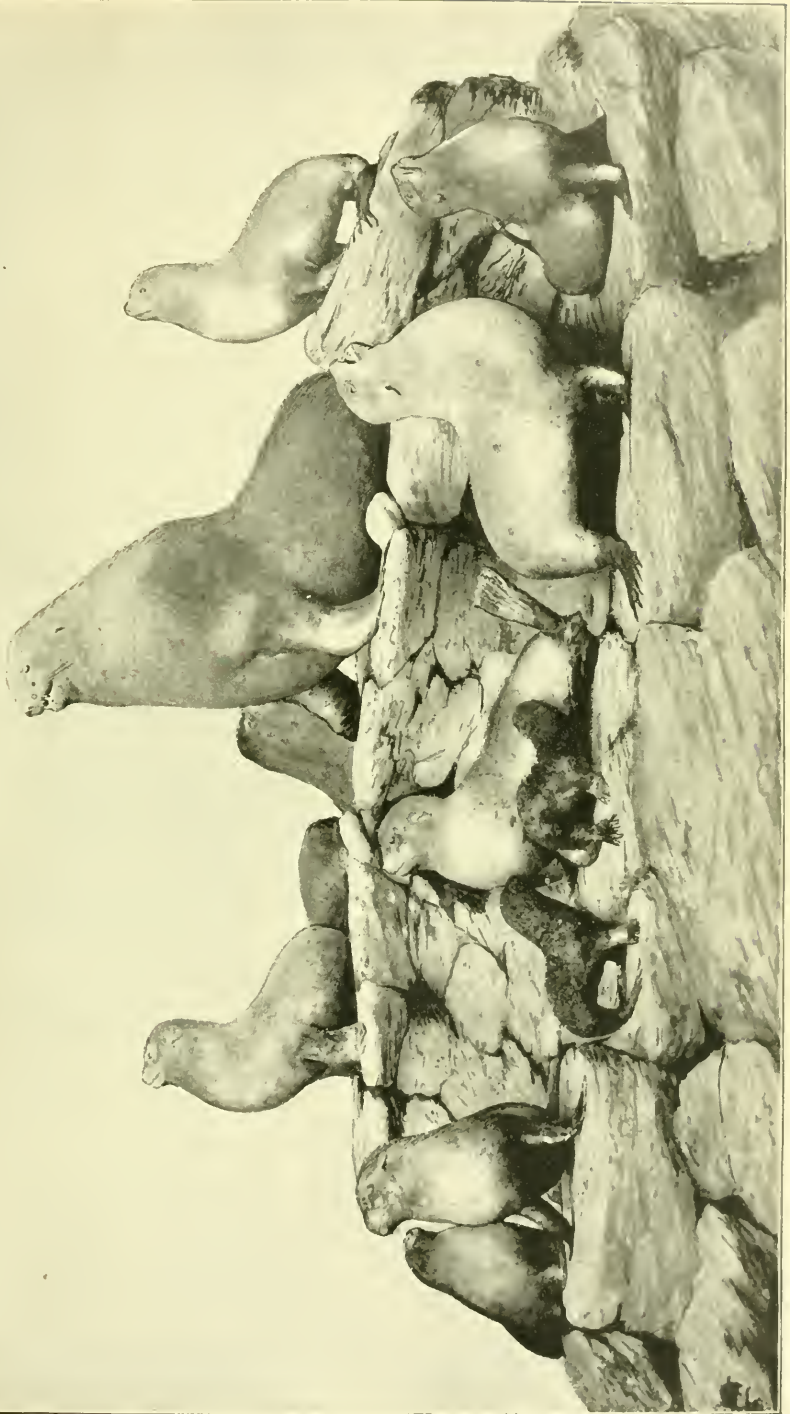
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\* A lion which, since 1870, has been displayed in the American Museum in New York City, is perhaps the best in this country. The National Museum has a hyena mounted by him which, though not one of his greatest works, is full of spirit.



A GROUP OF SKELETONS INTRODUCTORY TO THE SERIES SHOWING THE HOMOLOGIES OF THE BONES.





GROUP OF FUR SEALS, *CALLORHINUS URSINUS*.  
Mounted by Julius Stoezger in 1875 and exhibited at the Philadelphia Exhibition.





mounted in attitudes of repose for ease installation, nor is it intended to ignore the wonderful work done under Paolo Savi for the University of Pisa—work quite in the modern spirit, which the test of nearly a century has shown to have all the qualities of good workmanship.\* But for the fact that these are buried in the midst of a poorly installed collection in an inaccessible gallery in a small Italian city, possibly the spirit of modern artistic taxidermy would not have remained so long latent. The museum at Turin has also had excellent taxidermists in its employ.

At Leyden also much good work was done, and the animals were mounted in varied positions. The birds at Leyden afforded a striking contrast to those in the Natural History Museum at Bremen. These were mounted in fixed conventional attitudes, and since the museum possessed an immense collection of birds, they were crowded together side by side, heads toward the wall and tails projecting over the edges of the shelves toward the spectator, so that they looked like horses in a stable, viewed from the rear. This museum, as I saw it in 1880, was an eloquent teacher of methods to be avoided. It is to be hoped that, before now, most of these skins have been unmounted and placed in drawers in a study series, and a reasonable exhibition series substituted.

Mr. John Hancock, of London, many years ago did excellent work, combining artistic feeling with scientific accuracy, and Mr. E. T. Booth somewhat later developed a marvelous collection of British birds in his "Dyke Road Museum" at Brighton. These were mounted in life-like attitudes in the midst of natural accessories, and were satisfactory alike to artists and to naturalists. Following in the same course the admirably mounted collection in the Town Museum at Leicester was developed by Mr. Montagu Brown, and that in the British Museum of Natural History under Dr. Günther, beginning as early as 1880. On this side of the Atlantic, as early as 1870, most excellent work of this kind was done by Mr. Andrew Downes in his private cabinet in Halifax, Nova Scotia.

The Society of American Taxidermists was organized March 24, 1880, by Messrs. Hornaday, Lucas, Webster, Critchley, Jules Bailly (a pupil of Verreaux), Martens, and Fraire, all of Rochester, and a number of other taxidermists scattered through the country joined in the movement. This society was the direct outgrowth of the aspirations of the enthusiastic founders of the new American school, and had for its object not only the improvement of taxidermy from the technical standpoint, but the elevation and ennobling of the profession of taxidermy and the establishment of loftier ideals for the work.

The intention was to hold annual exhibitions, to secure the award of

\* A group of starlings around the skull of a sheep rivals the best bird group since made, and a boar attacked by hounds shows wonderful skill in mammal work.

prizes for the most meritorious advances, and to publish an annual volume of Proceedings, devoted to the discussion of the principles and methods of the art.

The ideals of the organization before very long developed to such a degree that they could not be worked out to the best advantage in a commercial establishment, and several members of the new school, having found that their objects were thoroughly appreciated and their efforts meeting with hearty support from the authorities of the U. S. National Museum, began to look to Washington as a wider and more promising field for their activities. In the National Museum, in the meantime, constant progress had been made, especially in the work of preparing casts and models in plaster. Some of the work prepared for the International Fisheries Exhibitions in Berlin in 1880 and London in 1883, would be regarded as admirable if done at the present time.

Soon after the reorganization of the National Museum in 1881 Mr. W. T. Hornaday was appointed chief taxidermist, and he was soon followed to Washington by Mr. F. A. Lucas, who, though an accomplished taxidermist, had given especial attention to the mounting of skeletons and anatomical preparations. Somewhat later came Mr. F. S. Webster, and others of the Rochester group would also have been added to the Museum staff but for our feeling of unwillingness to interfere with the important establishment at Rochester by taking away so many of its most competent men.

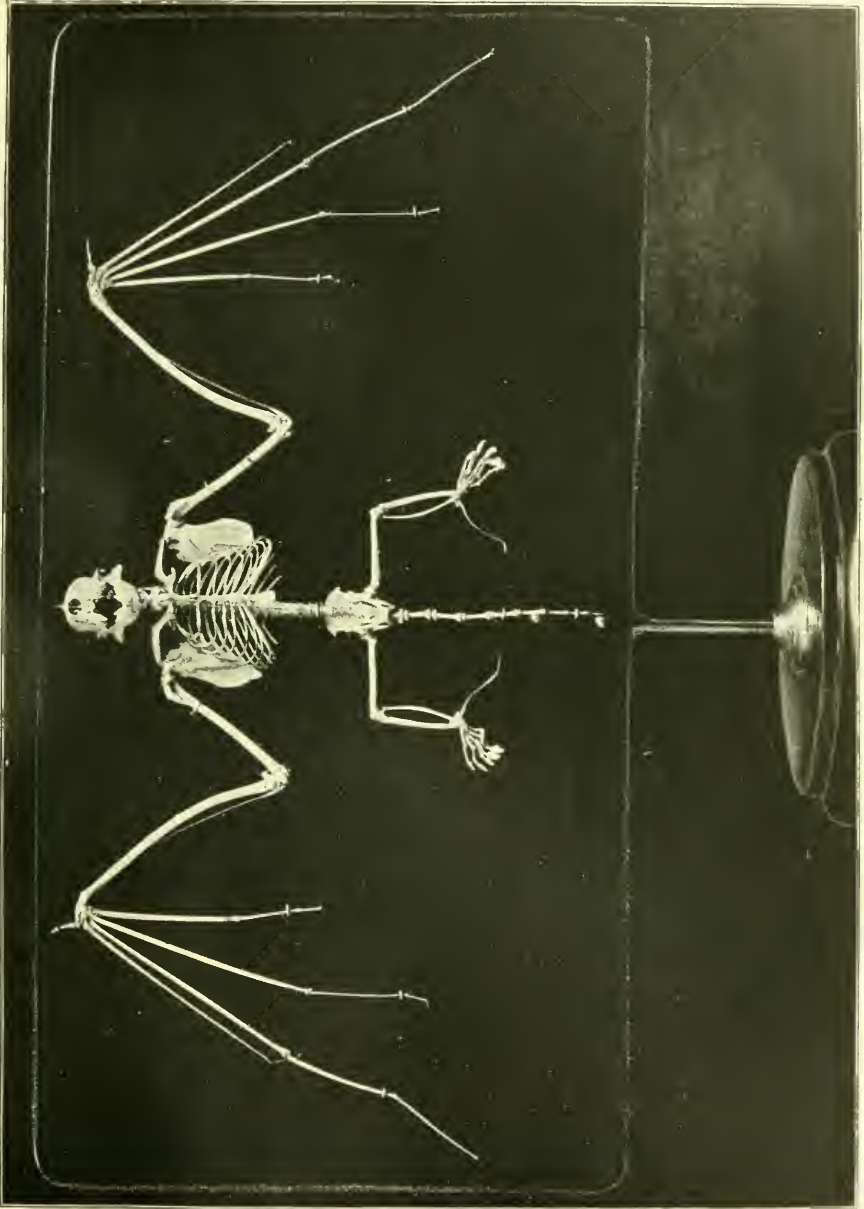
In the meantime the Society of American Taxidermists had been steadily at work. It held three annual exhibitions (in Rochester, in Boston, and in New York), and in 1884 another exhibition was held in connection with the Cotton Centennial Exposition at New Orleans and under the auspices of the National Museum. Three numbers of the reports were published. Since 1884, however, the society has been dormant. Perhaps its work had been accomplished. At all events, its influence was strongly felt, not only among taxidermists but through the larger and smaller museums of the country, and during the five years of its existence a decided change in public opinion had been effected.

The necessity for the development of a great mounted collection of mammals in the National Museum, and above all the execution of the plan for preparing monumental groups of the animals which are approaching extinction, mounted in natural attitudes and surrounded by proper accessories, has given a very wide field for work in higher taxidermy, and a number of young men from various parts of the country sought admission to the Museum workshops, where they received or completed their training. Among the most prominent of these may be mentioned the late Jenness Richardson, who was for three years in the Museum, and went in 1886 to become the chief taxidermist of the Museum of Natural History in New York City, where he accom-



SKELETON OF MEGAPODE, —TALEGALLUS LATHAMI, SHOWING METHODS OF MOUNTING.





SKELETON OF BAT, —*MOLOSSUS RUFUS*, — SHOWING METHODS OF MOUNTING.



plished some very noteworthy pieces of work, especially in the mounting of birds.

Mr. L. L. Dyche, now professor in the University of Kansas, also passed several months here, and learned the methods which have resulted in his excellent work upon large mammals shown in the Kansas State building at the World's Fair of 1893.

Mr. William Palmer, now chief taxidermist of the Museum, also received his first training during these years, and began a career which has resulted in the production of such remarkable work as the groups of Caribou, prepared especially for Chicago, which, in the judgment of the writer, have not been surpassed anywhere, marking as they do the highest attainment in the imitation of nature, with that combination of life with perfect repose which is the supreme test of merit in taxidermy. Many other men have profited by work in our laboratories, and are now scattered through the country, either attached to museums or in private business as taxidermists.

The taxidermists previously attached to the Museum have produced work in its way equal to that of their associates. The casts of reptiles, fishes, and cetaceans made by Joseph Palmer are by universal admission unrivaled, and this perfection was reached under Prof. Baird's encouragement before the Society of Taxidermists began its work and as early as 1876.

The bird work of Henry Marshall, though for the most part limited to preparation of specimens for shelf installation, has not been surpassed. Mr. N. R. Wood, who came from Rochester in 1888, has produced noteworthy work in groups of birds, and is especially skillful in the mounting of the various breeds of domestic fowl, which he has done with such painstaking accuracy that they may well serve as fixed standards in the development of the races of poultry. His work in restoring hair to skins which have become bare, is worthy of the most painstaking Oriental.

In the mounting of skeletons and anatomical preparations the highest standard of excellence has been aimed at, and it is believed that there is no collection of mounted skeletons in the world which can show more perfect pieces of work or a higher average grade of excellence. Mr. Lucas, under whose direction this collection has grown up, and who with his own hands prepared many of the most remarkable specimens (Pls. 32 and 33), has become curator of the department of comparative anatomy, but has transmitted the technical merits of his methods to Mr. J. W. Scolliek, whose work upon minute osteological preparations is little short of marvelous.

It might be said that these words of commendation would be in better taste coming from outside and written by one who has not been, in the matter of sympathy, so closely associated with the development of the ideals of the higher taxidermy and the furthering of their accomplishment. This was in my mind when, a year ago, I requested Dr. R. W.

Shufeldt, U. S. Army, who had recently published some articles on taxidermy in "The Great Divide," and who was also a judge of awards in the department of taxidermy at the Columbian Exposition, to prepare an article upon the modern museum taxidermy. It was the idea that Dr. Shufeldt, not being attached to any museum, would be able to examine critically and discuss the subject without prejudice, taking into consideration all that has been done elsewhere as well as in Washington, and this he endeavored to do. The predominance of illustrations taken from specimens in our Museum, as finally published, was not intentional, but was due to the difficulty of obtaining satisfactory photographs from other establishments. An effort was made to obtain illustrations from the New York Museum and from the British Museum.\* The illustrations obtained from these sources by no means did justice to the specimens illustrated, and the efforts to secure photographs of the Savi groups in Pisa, and of the rhinoceros mounted for the Medici collection in Florence three hundred years ago, were unsuccessful.

Dr. Shufeldt's essay, which was published in the Museum report for 1892, has attracted much attention, especially abroad, and the American taxidermic work, the excellences of which are suggested rather than fully depicted in the illustrations, has received much praise from those who are not familiar with it, and, if one may predict, the paper will be useful in still further raising the standard of museum taxidermy.

A special illustrated supplement to *Natural Science* was published in England on the occasion of the meeting of the British Association for the Advancement of Science. This was entitled "Taxidermy as a Fine Art," and was devoted not so much to a review of the Shufeldt article as to critical comments upon the illustrations, of which a selection of nine were reproduced. In closing his remarks the editor says:

In selecting the plates for this article we have paid but small attention to the many beautiful illustrations of birds. In respect to bird groups our home museums do not require much teaching, though even they have yet to learn that a bird can be mounted in the most natural manner on an ordinary museum perch or stand. It

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\* Dr. R. Bowdler Sharpe's paper on "Ornithology at South Kensington," in the "English Illustrated Magazine," December, 1887, pp. 166-175, gives an excellent idea of the British Museum groups, though the illustrations, not being photographic, do not afford the opportunity for judging the degree to which the accessories simulate natural effects.

We frankly admit that in the matter of environmental groups of birds, Great Britain still surpasses the United States. So far as taxidermy is concerned, American workmen can hold their own, but the art of making and grouping accessories we have yet to acquire. The only successful accessory work done in this country is that by the Mogridges, who were trained at South Kensington, and who are represented extensively in the New York Museum and by one piece in Washington.

Many of the groups of this kind, even when made by the Mogridges, err in making the accessories more prominent than the birds and filling the cases with artificial flowers and leaves to such a degree that the birds are entirely subordinate. An excellent illustration of effective and legitimate use of accessories is to be seen in the admirable group of king-rails in the New York Museum.





HEAD OF TIGER, FELIS TIGRIS.  
Mounted by W. T. Hornaday; illustrating modeling in clay under the skin. Ears with metallic substitutes for cartilages, and tongue skinned and built up within with clay.





BURCHELL'S ZEBRA, EQUUS BURCHELLI.

Mounted by W. T. Hornaday. Showing method of modeling of lips and eyes.



is in preparing the other classes of Vertebrata and the Invertebrata that American taxidermists take the lead, and it is their excellence in this direction that we have endeavored to set forth as an example.

But for the general approval of the American work, as shown in the comments upon this paper, I should perhaps not venture to express so frankly my own opinion as to what the American taxidermists have done, and, as it is, this is done chiefly for the purpose of explaining the causes which have led to its development.

The editor of *Natural Science* is quite right in questioning Dr. Shufeldt's statement\* that the development of taxidermy in the United States is due to the stimulating influence of the World's Columbian Exposition. As a matter of fact, the taxidermy at the Columbian Exposition, with the exception of that in the Government building and that of Prof. Dyehe in the Kansas building, was decidedly poor. Certain mammal heads mounted by Mr. Stainsky were of high merit. Beside these, there was scarcely a specimen of remarkable merit in the general taxidermic display; and many of the groups, so-called, illustrating the fauna of special States, belonged to the grotesque and unworkmanlike period of twenty years ago.

Very important advances had been made before the Chicago Exposition was organized, and there was scarcely a group among those shown by the National Museum which had not been planned and partially executed before preparation for the Exposition began. The Caribou groups already referred to are possibly exceptions, but these were simply advances along established lines.

To emphasize the fact that work of the very highest type was done in the Museum as early as 1884, representations are given here of a tiger (Pl. 34) and a zebra (Pl. 35) mounted by Mr. Hornaday and his assistants at that time. These have all been engraved before, but so unsatisfactorily that for the purpose of making a record in this place new plates have been prepared.

The true explanation of our advance in taxidermy lies in the happy relationship which was established in 1882 between the authorities of the Museum and the representatives of the Society of Taxidermists. These were based upon a recognition of the dignity of personal labor, and a recognition of the fact that work of this kind could not be done by men who counted their pay as the only remuneration for their exertions. The taxidermist was recognized either as an artist or as an expert artisan, as his individual capacities might merit, and he was encouraged to do every part of the work with his own hands, trusting nothing to laborers or ordinary mechanics. He was furthermore told that one specimen well mounted would be more highly appreciated than twenty "stuffed in the old way," and that no expenditure of thought,

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\*Dr. Shufeldt assures me that his statement has been misapprehended, and that he quite agrees with the critic in his views as to the cause of the development of the higher taxidermy.—G. B. G.

time, or material, was too great, if needful to secure the very best possible results which his abilities would enable him to produce. When he had accomplished a really creditable and conscientious piece of work, his name was placed upon the label as its maker. In this way a good piece of taxidermy is placed in the same standing, in its way, as a book printed by Mr. William Morris or one bound by Mr. Cobden-Sanderson.

One of the former members of the Museum staff of taxidermists, now engaged in other pursuits, writes:

The fact that the National Museum gives the author of a really good group credit for it on the label has had a great influence for good. The American Museum is the only other that I have ever known to do this; but if the museum officers generally could only know the tremendous stimulus this is to even the humblest taxidermist all would take advantage of it. And it costs nothing. If your plan in this respect were universally adopted it would be a constant and powerful stimulus to the production of the finest kind of work.\*

No taxidermist or modeler was placed in a responsible position who was not himself a naturalist and whose own instincts did not lead him to study a living model or the best attainable pictures or sculptures of similar subjects before beginning his work, and whose painstaking habits of research did not have an influence upon his method of work to such an extent that he would work out every muscle and bone with reference to casts or skeletons before him in his workshop.

The workshops soon became filled with photographs and casts, and among these would be seen models and sometimes originals from the hand of Barye and other sculptors, whose art the taxidermist attempted to adopt as far as possible into his own. These men were members of the scientific societies, and some of them have since become specialists in science, although they have never lost their relationships to their previous work. Prof. W. B. Scott, of Princeton University, and Prof. F. H. Knowlton, of Columbian University, did excellent work in taxidermy before leaving it for research-work, and Mr. L. L. Dyche, although professor of zoology in the State University of Kansas, mounted with his own hands most of the specimens in the great groups shown in the Kansas State building at Chicago.

Incidentally it may be mentioned that many American naturalists are amateur taxidermists, and that some of the most successful groups of mammals and birds in the Museum have been done by workmen not possessed of artistic skill though excellent in technique, whose work has been designed and directed by the curators of the several departments.

In connection with these discussions of American work it seems desirable to refer to the extensive collection of South African mammals and birds, exhibited at the Dr. Emil Holub's South African Exposition in Prague in 1891.† The mammals were mounted in groups in

\* A label of the kind here referred to is illustrated in one of the plates.

† Dr. Holub's South African Exposition was held in the building erected for the National Jubilee in Bohemia in 1891. Here were exhibited the material results of



GROUP OF TWO SPECIES OF AFRICAN KUDUS, STREPSICEROS CAPENSIS AND S. ZAMBESIENSIS.  
Collected by Dr. Emil Holub and mounted under his direction for the South African Exhibition, Prague, 1892.

AMERICAN PHOTOGRAPH CO. N.Y.



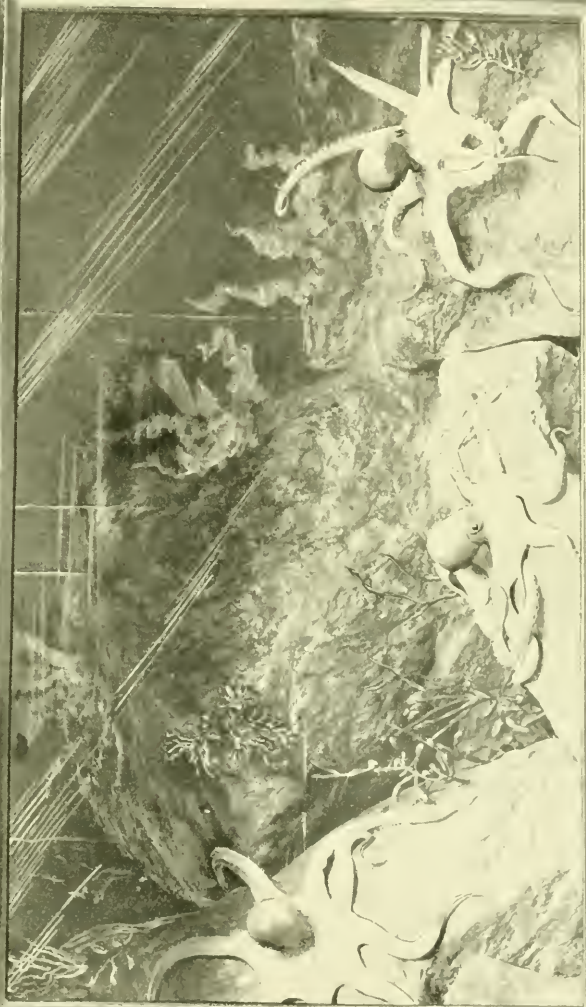




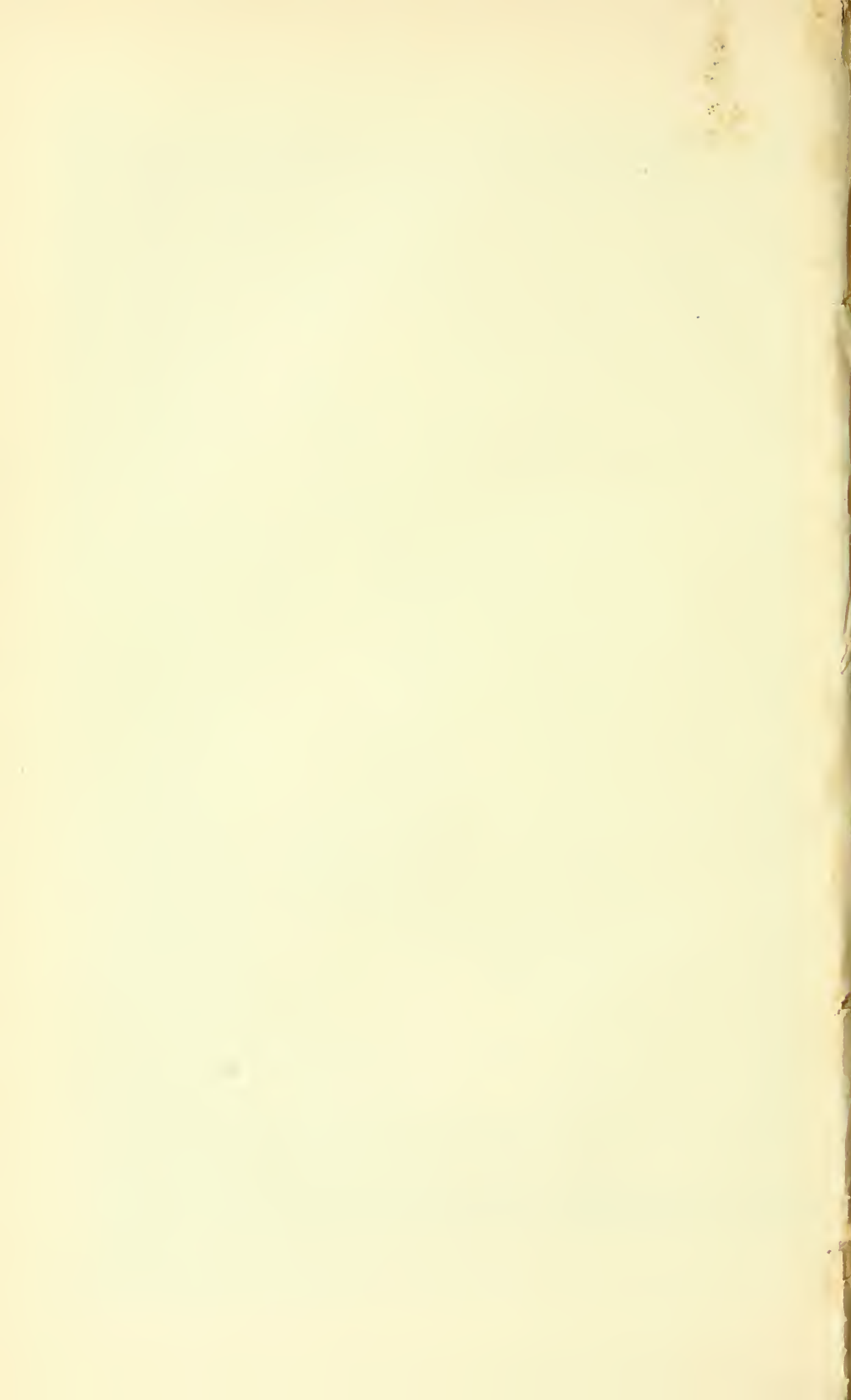
A "NESTING COLONY" OF *MEROPS RUBICOIDES*, ON THE LOWER BANK OF THE TSHOBE RIVER,  
NEAR ITS JUNCTION WITH THE ZAMBESI. (MO-RUTSE KINGDOM.)

Mounted under the direction of Dr. Emil Holub for the South African Exhibition, Prague, 1892





GROUP OF OCTOPUS - OCTOPUS VULGARIS.  
Mounted in a glass case to produce the effect of life under water



varied attitudes, and some of these groups were admirable. One of them is here illustrated, as well as one group of birds (Pls. 36, 37).

*Environmental groups of marine animals.*—It has long been a favorite idea of the writer that the appearance and habits of fishes and other aquatic animals might be best shown by mounting some of our colored casts among natural surroundings in a case resembling an aquarium tank, and admitting most of the light from above through glass so tinted that the appearance of being under water would be given. All attempts in this direction failed, however, and it has remained for Mr. Lucas, in his group of Octopus (Pl. 38), to show that it is possible. It is intended to carry this still further, and especially to attempt to show the life of the coral reefs.

Some groups of reptiles, colored casts in the midst of natural surroundings, have also been completed, and these, though not realizing our highest ideals, show that there are good possibilities in this direction. The stuffing of skins of fishes has been carried to high perfection in Europe, owing to the desire of anglers to preserve trophies of their successful excursions in their own homes. Simple accessories, such as suffice to represent the shores of a stream or lake, are used with them with a very good degree of effect. A wonderful display of these angling trophies was shown at the International Fisheries Exhibition in London in 1883. It is our experience, however, that it is scarcely advisable to stuff a scaly fish or reptile. Sharks may be stuffed, but fishes are neither satisfactory nor lasting. If casts can not be had, it is best to be content with preparations in spirits.

*The mounting of the Pacific walrus.*—In the discussion of the recent taxidermic work in the Museum which has appeared from time to time during the past year in the scientific journals, the Pacific walrus, which was exhibited at the World's Fair, has been severely criticised, and it has been said that it is inartistic and false to nature.

The preservation of a worthy memorial to the North Pacific walrus is especially desirable, since this is one of the species threatened with extinction. Numbered by tens of thousands and flocking together in immense droves when the American whaling fleet first entered the Arctic in 1854, they have now been reduced to a mere handful in American waters, and the old males are now entirely extinct in the Western Pacific, and it is doubtful whether this particular phase of the species is to be found anywhere. The specimen shown at the World's Fair (Pl. 39) is an admirable example of the old male, and since it was

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Dr. Holub's second exploring trip to South and Central Africa in 1883-1887, which were first exhibited in 1891 in Vienna. The exposition at Prague was the most complete, 13,000 objects being exhibited in addition to the groups of mammals which were mounted in accordance with measurements made by Dr. Holub in Africa. There were a number of groups of natives exhibited in connection with their actual dwellings and the implements of their arts and industries. A large album of views of this exposition and of the groups was presented to the Institution by Dr. Holub.

acquired only after long and continued effort it seems but proper that its truth to nature, as now mounted, should be vindicated.

The skin in question was mounted by a most skillful and conscientious member of the staff, the chief taxidermist, Mr. William Palmer, who spent some months on the Pribilof Islands making preliminary studies in order to fit himself for this particular undertaking.

Capt. E. P. Herendeen, formerly of the U. S. Coast Survey, who was familiar with the Arctic Ocean for fifteen years, and who has seen tens of thousands of walrus in the times when they were abundant, in 1854 and in subsequent years, and who has seen thousands of them at one time upon the shore at Sandy Point, says of the specimen in the Museum:

I am satisfied that the mounted walrus is true to nature and in every respect an admirable piece of work. The only criticism which I would make upon it is that an animal in the attitude of extreme attention and activity in which this is represented would be slightly smaller about the neck. The arrangement of the wrinkles in the skin and the tuberculated appearance of its surface are perfect, and the attitude of the limbs can not be criticised.

The following statement of the material upon which the treatment of the skin was founded is supplied by Mr. Palmer:

(1) *Personal observations.*—On August 7 we landed from the U. S. revenue-cutter *Rush* on Walrus Island, having previously seen the remnant of a walrus herd, consisting of eight individuals, on the island. We landed on the southern end of the island and made our way over the rocky interior toward the walrus, but unfortunately the vessel remained within sight of the animals, and the sailors from the boat in which we had landed instead of keeping on the other side of the island persisted in getting into view of the walrus, with the result that before we got within shooting distance they made preparations to leave the rocks. Before us was a wide crevice in the rocks full of water, so that it was impossible to get over it, and there not being time to get around the head of it before the walrus took to the water, I sat down on the rocks at the edge of the crevice and examined the animals at leisure. Before they had reached the water I had succeeded in fixing in my mind the most important features of their physiognomy. The walrus nearest to me was the one that I examined most thoroughly, and I convinced myself of the fact that the general positions of the walrus, as delineated in Mr. Elliott's pictures, was true, and in mounting this specimen I followed as closely as possible the picture which remained in my mind of this particular walrus. I had a fine view of the animal, which was distant not more than 20 rods and within easy gunshot. No attempt was made to kill the animal, however, since it was so near the water that if it had been struck it would have fallen and been lost. Then, too, I hoped that there might be another opportunity of capturing a specimen.

(2) *Measurement from the fresh specimen.*—The skin which was mounted was obtained by the *Rush* ten days afterwards. This was after I left the island, however, and I was unable to study the animal in the flesh. Dr. White, the surgeon of the cutter, however, made careful measurements in accordance with specifications which I left in his hands, and I am satisfied that these measurements are accurate. They met all the necessities of taxidermy, and are practically those which I would have taken had I been present. The only thing lacking which I could have supplied would have been casts and photographs of certain portions. I had, however, the advantage of the head already in the Museum, which was received from Alaska in pickle and practically in the flesh, and was mounted in that condition after careful study by Mr. Hornaday. I also had a photograph of the great head of an Atlantic walrus.



PACIFIC WALRUS.—*ODOBOENUS OBESUS*.  
Mounted under the direction of William Palmer for the U. S. National Museum.









MOUNTING THE PACIFIC WALRUS.

(3) *Pictures.*—I had devoted some years to making a collection of tracings of all the illustrations of the walrus in books of travel and natural history, and think I had assembled some twenty of these, and am satisfied that I had, if not all, at least all of the most important of those which made any claim to have been made by observers. These were all quite unlike Mr. Elliott's drawings, but, as I have said, personal observation satisfied me that these drawings were true to nature and the others not. I showed Mr. Elliott's pictures to many of the natives and others on the islands, who all expressed themselves as perfectly satisfied with them.

(4) *Anatomical indications.*—In mounting the specimen the large wrinkled folds on the skin around the limbs and body were followed as closely as possible, and these, as every anatomist knows, indicate in no uncertain way the customary attitudes of thick-skinned animals such as the walrus, the rhinoceros, the elephant, and the armadillo. The shape and position of the warts on the neck, which look so grotesque and unnatural in the Elliott pictures, were clearly shown in the skin and could not possibly have been very different from those which Mr. Elliott delineated. Even the inflamed surface as shown in the drawings, giving such a ghastly and disagreeable appearance to the animal, were manifestly true to nature, which is also supported by the testimony of people on the island and by Capt. Herendeen.

The deep wrinkles at the base of the flipper, have been criticised as unnatural, but my own observations on many specimens of fur seal, sea lions, and walruses, and which are confirmed by many competent observers whom I have consulted (in fact, they can be readily found on any pickled skin), satisfied me that I was correct.

The thinness and smoothness of the skin in the center of these wrinkles, their position and general direction, even as illustrated in the palm of one's own hand, will convince anyone who sees them that there must necessarily be wrinkles at those points when by the position of the animal the skin and blubber is entirely released of all tension and even crowded on itself; indeed, the most conspicuous feature of the surface of an animal of this division of the pinnipeds as he moves about, is the rapid change in the position and form of these wrinkles on many parts of the body.

The accompanying illustration (Pl. 40) shows the manner in which the folds appeared in the fresh skin, the process of making them permanent, and the manner of preserving them as the mounting progresses.

Criticisms have been made also upon the shape of the nostrils. In regard to this I can only say that my guide was the appearance of the nostrils in the skin before it was fleshed, and when it was comparatively fresh. This I considered myself justified in doing, since I am not aware that anybody has made careful observations upon the appearance of the nostrils close at hand, except Mr. Elliott, whose drawings correspond with my interpretation, and Capt. Herendeen says that the walrus never opens its nostrils wide, and that it is only when breathing or excited that they are open to any considerable degree.

It has been also said that the neck is possibly a little too large, but the dimensions of the specimen as mounted are smaller in this part than is indicated by the measurements made by Dr. White. In mounting it I took into consideration the probability that the animal in life, standing with head erect and muscles rigid, would measure somewhat less.

It should be clearly stated that the preparation under discussion was intended to show the appearance in life of the animal to which this skin belonged, namely, an old male such as are rarely seen, and that none but old males assume the grotesque attitudes of which this is one. A young male would never present the same appearance even in the same attitude, because they are comparatively smooth, with thinner skins, more hair, and fewer tubercular growths upon the surface.

It should be said also that this represents the animal upon land and in action, just as it would appear after being aroused from sleep and just before making its way to the water. The customary attitude in which walruses are mounted, with

the flippers stretched out behind as in the hair seals, is not itself untrue to nature, but is only assumed by them when in repose or asleep, while with the hair seal it is constant.

It has been questioned whether it would be wise to mount a young Pacific walrus in the same attitude as that of the old male under discussion, but Capt. Herendeen states, from his experience, that all walruses, young and old, assume these positions when in action.

#### REPRESENTATIONS OF THE HUMAN FIGURE.

For fifteen years the Museum has been constructing models of the human figure for use in the exhibition series, and has been striving by various means to secure the best results in this direction.

These figures are required for three purposes: (1) To show the characteristics of the different races, (2) to display costumes, and (3) to illustrate the methods of use of weapons, instruments, and processes of various arts and handicrafts.

For the first purpose it is manifest that the greatest accuracy and fidelity to nature is necessary, or the result will be useless. For the others the same degree of accuracy is, perhaps, not essential, if the labels clearly indicate that the faces are not portraits, but so far as possible the figures intended chiefly to show costume and action should attain the highest possible anatomical perfection.

The use of well-constructed figures in scientific museums is of quite recent origin, though manikins of conventional type have long been employed in collections of costumes and armor; and many very creditable efforts in this direction have been made in connection with exhibitions.

Before beginning our experiments we were familiar with the altogether admirable gallery of historical figures in Castan's "Panopticum" in Berlin, and with those of Madam Tussaud in London, not so very good in execution, but nevertheless of high interest to the masses. We knew the representation of races of mankind at Sydenham and the Swedish peasant figures which had been so popular at the Philadelphia Centennial. We have since become familiar with the separate groups showing the history of primitive man, made for the Paris Exposition in 1888-'89, and the figures of race types in the Trocadero Museum in Paris. Indeed, we owe to the courtesy of Dr. Hamy the privilege of having had made copies of several of the latter, one of which is here illustrated (Pl. 41), and at the same time obtaining a replica of the Roman warrior in armor, modeled for the Museum of Artillery in Paris, by the sculptor Bartholdi.

It is scarcely worth while to mention the ghastly wax figures of Kane, the arctic explorer, and his companions, in costumes of fur, which were displayed in the old Smithsonian Museum as early as 1870. These, and the equally crude manikins of Eskimo Joe and his wife Hannah, made in 1873, have long since been discarded and have no place in the history of recent efforts.



FIGURE OF MASAI WARRIOR, UPPER KONGO.

From specimen in the U. S. National Museum: a replica of the figure in the Musée du Trocadéro, Paris.





JAPANESE MAN AND WOMAN OF THE LABORING CLASS.  
Manikins constructed in Japan for the U. S. National Museum.







FIGURE OF JAPANESE MAN OF THE LABORING CLASS, UNDRAPED.  
Manikin made in Japan for the U. S. National Museum.





KAN-KU-WASH-TE-WIN (THE GOOD ROAD WOMAN), YANKTON SIOUX.

Plaster cast, with hair, eyes, and costume in plaster. Modeled for the U. S. National Museum by M. Achile Colin, and painted by A. Zeno Shindler.





CHE-TA-WAU-KOU-VA-MA-NI (THE HAWK THAT HUNTS WALKING), MEDAWANKATON SIOUX.  
Plaster cast, with hair, eyes, and costume in plaster. Modeled for the U. S. National Museum by  
M. Achille Colin, and painted by A. Zeno Shindler.  
(Cat. No. 76858, U. S. N. M.)





CHOCTAW SQUAW (ROSA WHITE THUNDER).

With artificial hair; sculptor's eye in plaster; actual costume. Modeled by U. S. J. Dunbar for the U. S. National Museum.





The first advances were made in 1875, when four costumed figures were imported from Japan. These were exceedingly spirited and effective, and when examined in detail showed such conscientious workmanship and such thorough fidelity to nature that they have served as an inspiration and a model for our workmen up to this day. Two of these figures, representing an actor and an actress in the costume of Japanese nobility, were carved in wood, and seem to show the extreme limits of this material in the construction of the human model. The other two, a laborer and his wife (Pl. 42), are in papier-maché and are satisfactory in the highest degree. The material is brought to an extreme of hardness, strength, and delicacy of line which no American workman has been able to rival. Indeed, we have not yet progressed beyond the use of the much heavier and clumsier plaster of Paris. The modeling is almost perfect, as may be judged from the fact that the figures, with or without clothing, stand poised upon their feet without any attachment to the bottom of the case. The hair is attached directly to the figures and has none of the wig-like appearance which is almost universal in figures of this kind. The eyes, though glass is used for the outer film, are not glass eyes. Even the nails are cunningly fashioned of horn and inserted; and the coloring, of which more will be said hereafter, is as yet the despair of our workmen. The figures as a whole exhibit such conscientious and painstaking accuracy, and such fidelity to nature in the smallest details, that too much can not be said in their praise. (See Pl. 43.)

In 1881 some figures were made for us by M. Achille Colin, a French sculptor living in Washington, on a new plan. These were executed in accordance with the rules of sculpture, the hair and the clothing to be of the same material as the head and body, and the sculptor's eye to be used instead of the customary one of glass. They were then painted by a portrait painter whose life had been spent in delineating Indians. The result was thoroughly satisfactory, and nothing better has since been done. (Pls. 44 and 45.) It is probable that this method will be used more and more in the future, since many of the races whose lineaments and costumes it is most desirable to perpetuate can only be shown in this way. Their costumes no longer exist, and must be supplied by the modeler and painter from such portraits as those of which we have a large number in the Catlin gallery. When actual garments are not used, there is no reason for the unsightly wig or the staring glass eye.

A modification of the same method was employed by Mr. U. S. J. Dunbar, a Washington sculptor, in modeling the face of a Sioux girl, Rosa White Thunder, for a full-length figure to be clad in a modern Sioux costume of blue cloth ornamented with elk ivory, obtained from the original, at that time a pupil in the Indian school at Carlisle. In this figure, although the sculptured eye is used, the hair is represented by a wig. The result is only partly satisfactory, but the experiment is an interesting one. (Pl. 46.)

More recently other methods have been employed. Mr. J. W. Hendley, a man of great ingenuity and mechanical skill employed in making models of fruit, produced a cast from life of a negro boy, which in its way is something entirely unique. Although no portion of the figure was touched by the modeler or sculptor, it has the merit of absolute accuracy, and yet is surprisingly spirited and life-like—a Samoan youth (Pl. 47), modeled from photographs under the direction of Lieut. W. E. Safford, U. S. Navy, who is very familiar with these people; a Dyak warrior (Pl. 48), produced in the same way under the supervision of Mr. Hornaday, and an Indian in feather costume (Pl. 49), from a painting by an Indian artist of Chile, are thoroughly satisfactory, as is also a Bantu negro boy, modeled by Mr. Theodore Mills from life, by the aid of casts. (Pl. 50.)

A number of figures of the same general character were prepared for the World's Fair. None of these were so carefully made as those already described, owing to the confusion and haste which always attend the preparation for a great exhibition. A new feature of the greatest interest was, however, introduced among the figures prepared for this occasion, and a set of groups, unique and full of interest, was the result. These, as shown in the cases, surrounded by proper environmental accessories and engaged in the occupations peculiar to the tribes which they represented, were no longer pieces of sculpture but pictures from life. The success of these groups is due to the supervision exercised by Prof. W. H. Holmes, artist as well as ethnologist, who gave life and pictorial expression to the figures already accurately modeled and costumed by the Museum preparators, who himself designed a spirited group of Powhatan Indians quarrying material for the manufacture of stone implements, which was modeled by Mr. U. S. J. Dunbar. To Mr. Frank Hamilton Cushing, whose long residence among the Indians of the southwest has given him perfect familiarity with their customs, and in whom mechanical skill supplements an artistic temperament, is due the perfection of other groups showing the life of these people. These are:

1. The Zuñi ritual of creation.
2. The Zuñi bread-makers and millers. (Pl. 51.)
3. The Zuñi potter.
4. The Zuñi basket-maker.
5. The Zuñi belt-maker.
6. Navajo women, spinning and weaving.
7. Indian women of the plains dressing hides. (Pl. 52.)

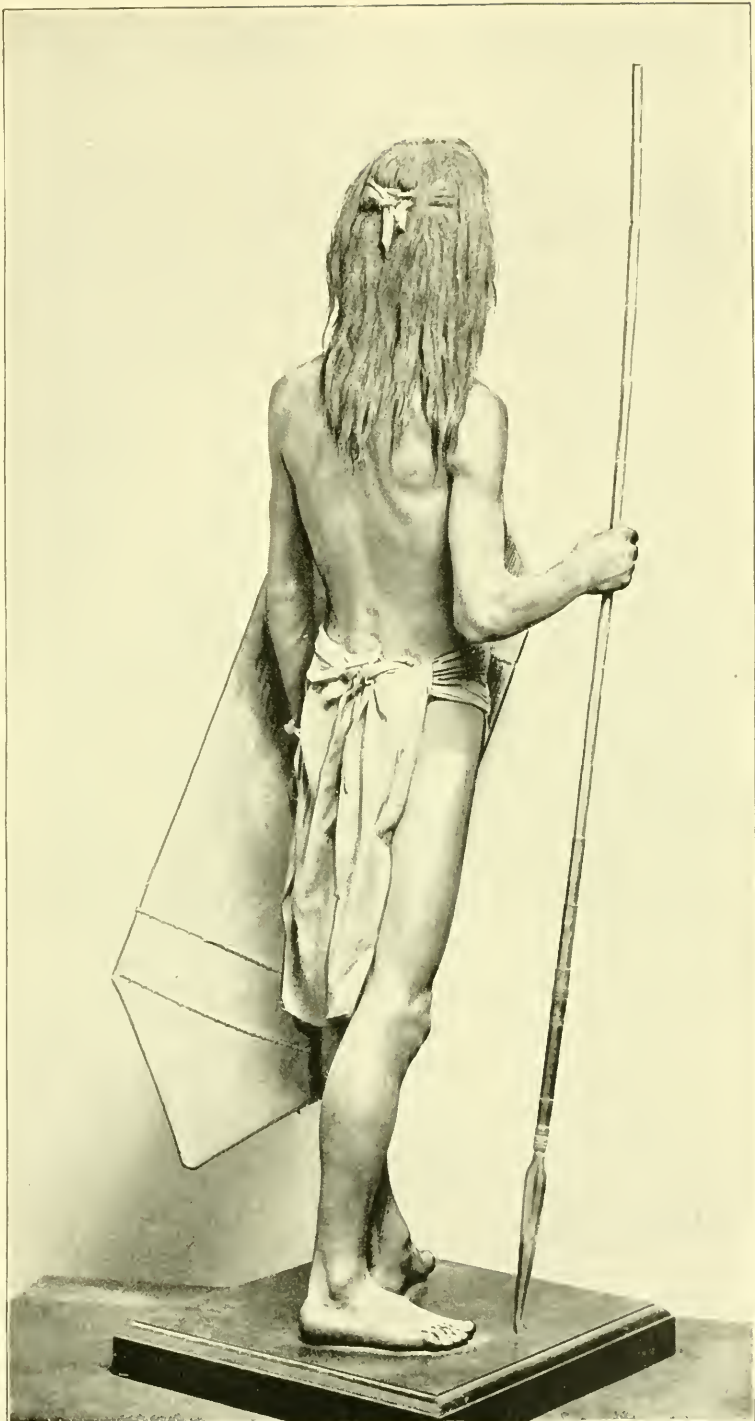
The first group of the new style made was the group of Kiowa children at play, equally good in its way, designed some years ago by Mr. James Mooney, of the Bureau of Ethnology, who also planned the group of Navajo silversmiths. Dr. W. J. Hoffman's "The Primitive Scribe," a Chippewa shaman in his lodge writing an incantation on prepared birchbark, and another of a Crow Indian painting a blanket, are worthy of notice.



SAMOAN YOUTH.

Modeled for the U. S. National Museum by Theodore Mills.





DYAK WARRIOR.

Modeled for the U. S. National Museum by Theodore Mills.





XIVARO INDIAN IN FEATHER COSTUME.  
Modeled for the U. S. National Museum by Theodore Mills.



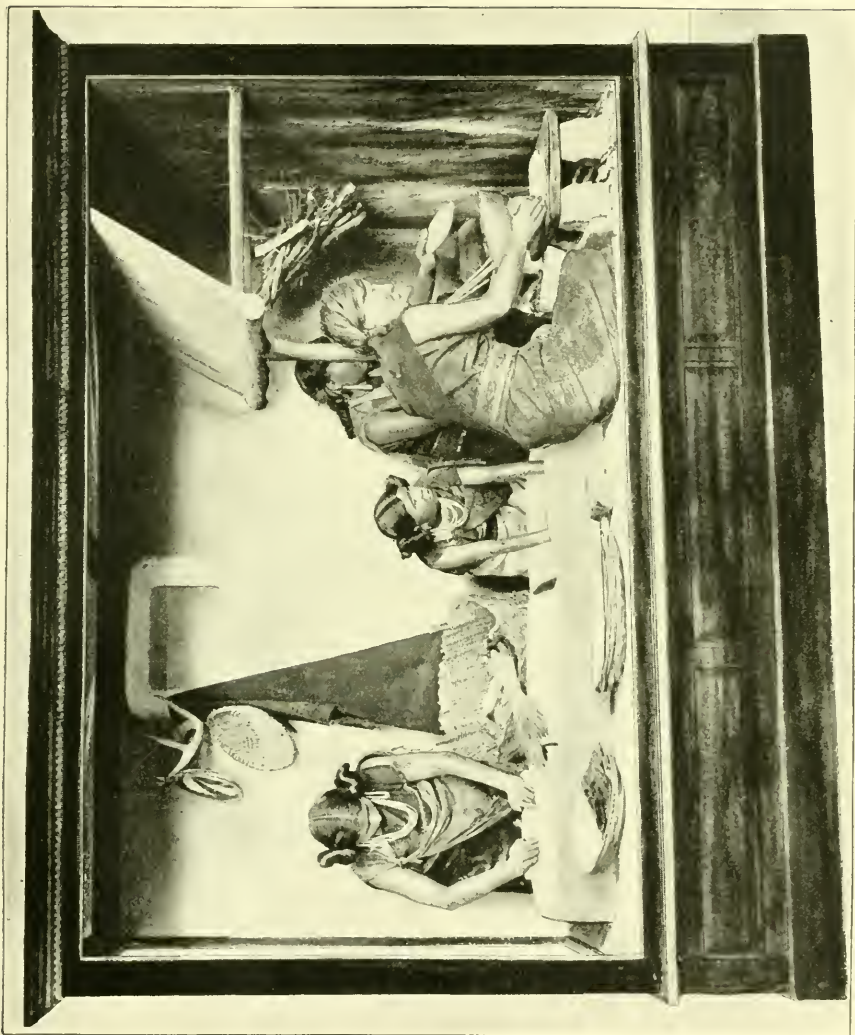




BANTU NEGRO BOY.

Modeled for the U. S. National Museum by Theodore Mills.





ZUNI BREAD-MAKERS.  
Prepared under the direction of Mr. Frank H. Cushing.





INDIAN WOMEN DRESSING HIDES.  
Prepared under the direction of Mr. William H. Holmes.



The groups of Loucheux and Hupa Indians, arranged by Prof. Holmes, were also effective artistically, though lacking the advantages which a personal acquaintance with the tribe would have given the designs.

The relative values of costumes and implements displayed upon manikins, and those shelved in cases with tickets explaining their uses, need no discussion. A caution should be written to museum men, however, which is that it is very dangerous to try to make such groups except under the eye of an ethnologist who has been among the people to be represented. The object of a reference to these groups is simply to call attention to the fact that something has been done which was never before attempted for the American Indian, and that the result seems to more than justify the effort.

Experiments are still in progress, and it is believed that figures still more truthful and life-like than any that have yet been produced will be the result. The most serious difficulty to be overcome is in the treatment of the surface of the figures and their coloring. We use only plaster of Paris. Wax, which has been so often employed for faces and hands, has been discarded as being too delicate, and not so well suited for life-like effects as plaster. Papier-maché, as has been stated, our workmen can not manipulate so as to produce sufficient hardness of surface and delicacy of line. The gelatine which has been used for natural history preparations offers no absolute permanence. Plaster of Paris has only one objection, which is the roughness of its surface. It is now believed that the smoothness and texture of the flesh can be produced by the use of some of the mineral waxes.

The question of coloring is a more difficult one. Our Japanese figures, on close examination, do not present a uniform hue, but have a solid body color, enlivened by innumerable dots of a much darker tone. These are produced by some spatter-work process, either by spraying from a stiff brush, or by blowing the pigment in a fine spray from the mouth. When viewed at a short distance, the effect is precisely that of living flesh. Experiments are now being made with the air brush, which will doubtless produce the same effect.

The representation of human hair, especially of the beard, also presents great difficulties; but it is believed that in time the use of plaster and paint will supplant the products of the wig factory.

It will be observed that the steps of progress in modeling man have been very similar to those in the mounting of the lower animals, and the influence of the skilful American taxidermist has been felt everywhere in this work also.

Allusion has already been made to the taxidermy at the Holub exhibition in Prague. The mounting of anthropological groups was even more ambitious and successful, and is illustrated here by three plates, showing a group in action, a group in repose, and a single figure to show details of modeling. [Plates, 53, 54, 55.] In the anthropological as well as the zoological groups, the generous space of the exposition

afforded opportunities which are not often available in museums. Indeed the permanence of museum work seems to demand not only greater compactness, but more reserve, repose, and dignity than is necessary in installation for a temporary exhibition.

#### ENVIRONMENTAL GROUPS.

It is not expected that in the ethnographical museum of the future the lay figure will supplant the show case as a means for displaying ethnographic collections: but just as naturalists may feel it legitimate to use a considerable number of cases of animals mounted in the midst of natural surroundings to illustrate their habits or to make impressive memorials of species which are rarely seen or likely to become extinct, so will the anthropologist employ figures, not only for the education of the public, but as a more sure means of preserving certain of the most precious memorials of the primitive races of mankind.

It will soon be time to consider the question to what extent museums are justified in the use of environmental groups. It is evident that this may be carried too far and be made tiresome instead of agreeable to visitors, while at the same time producing an effect quite opposite to that of dignified and systematic order, which should be characteristic of every museum. Furthermore, specimens thus mounted, unless the workmanship is of the very best and the cases practically perfect and impervious to air, are certain to deteriorate, since it is very difficult to get at them in order to cleanse them and protect them from vermin. The writer has seen neglected cases of this kind in some of the largest government museums of the Old World, which were serious warnings against departure from the practice of individual mounts in cases free from the incumbrance of accessories.

In the National Museum a definite limit has been fixed. Environmental groups will only be made in the case of the larger mammals and birds which are rarely seen and are on the verge of extinction, or for the purpose of illustrating some very remarkable habit.

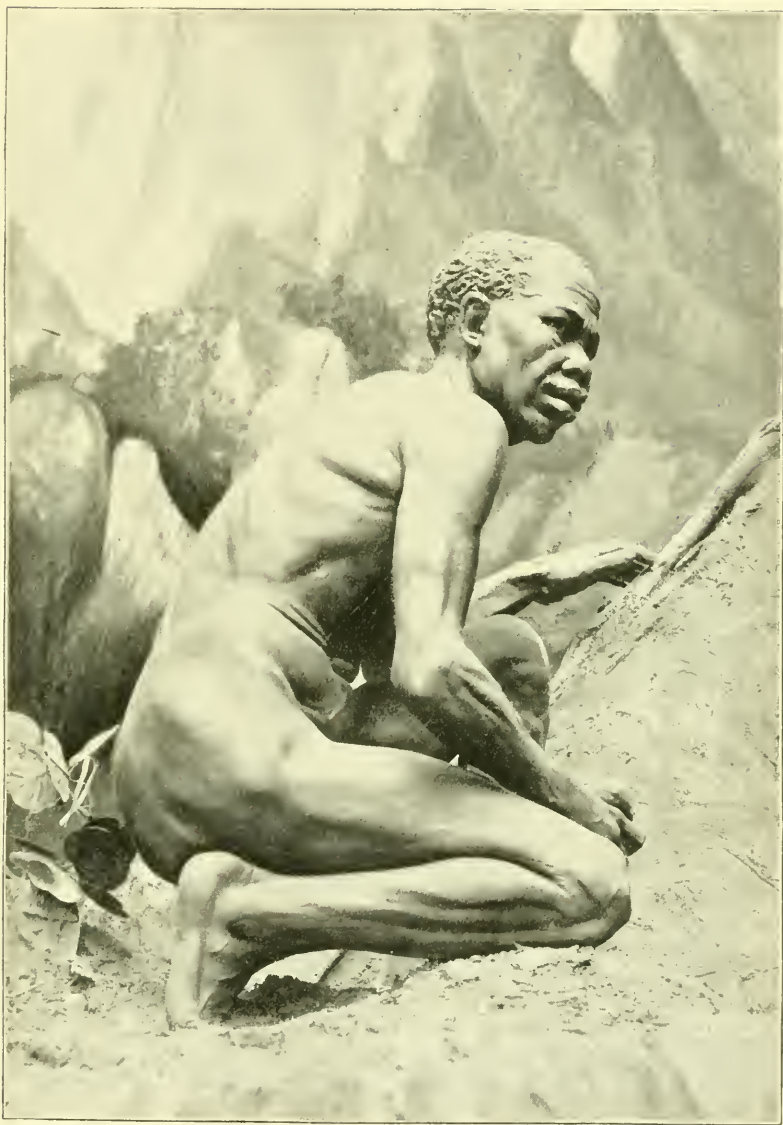
It has been found in the installation of our department of birds that the series of Audubon's plates, showing the habits of birds, framed and hung near the exhibition cases, are almost as effective as the groups mounted to illustrate the same phases in their habits.

#### CONCERNING COLLECTIONS AND SPECIMENS.

The following principles in regard to collections and specimens represent in a general way the ideas which underlie all our recent work:

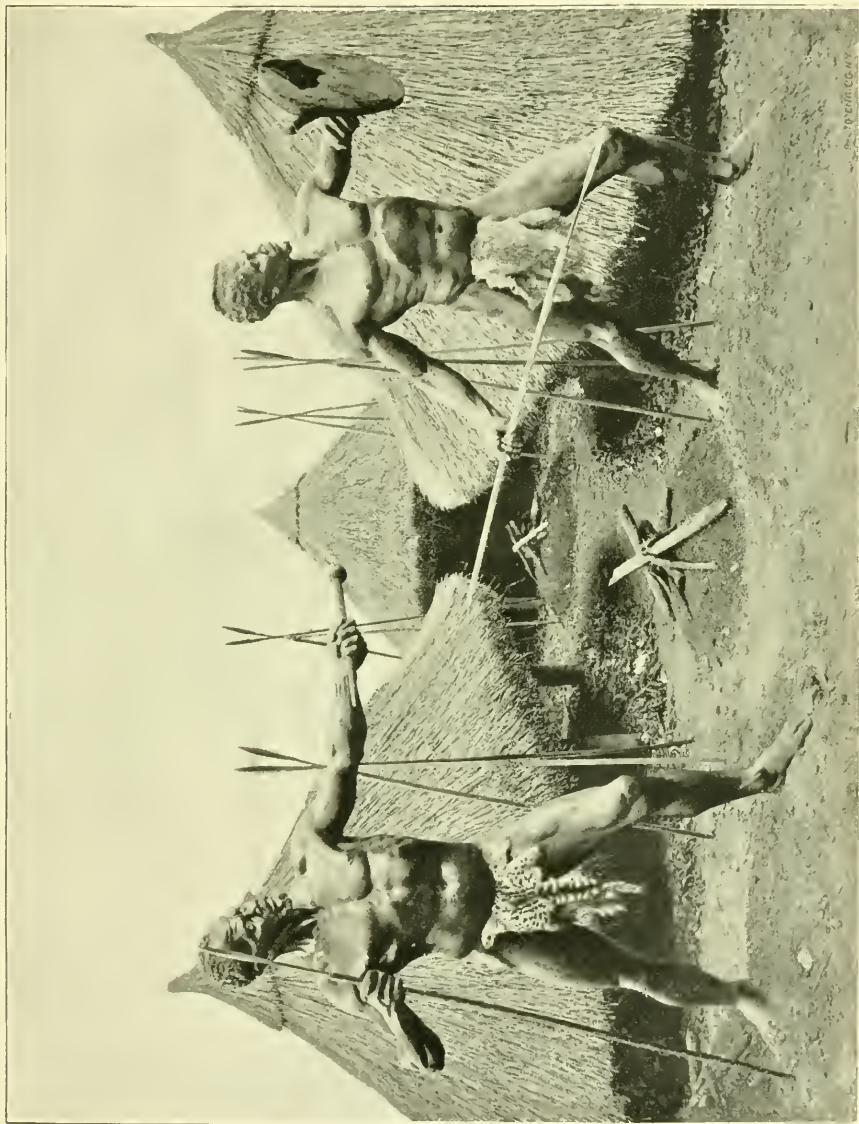
*Collections in general.*—Any object which has a name may be used in museum work. It does not follow, however, that any one museum should attempt to include all such objects, nor that there are not many which, in the present stage of museum practice, might not be entirely neglected.





A BUSHMAN IN THE ACT OF ENGRAVING FIGURES WITH A STONE HAMMER ON A DIORITE ROCK.  
Mounted under the direction of Dr. Emil Holub for the South African Exhibition, Prague, 1892.

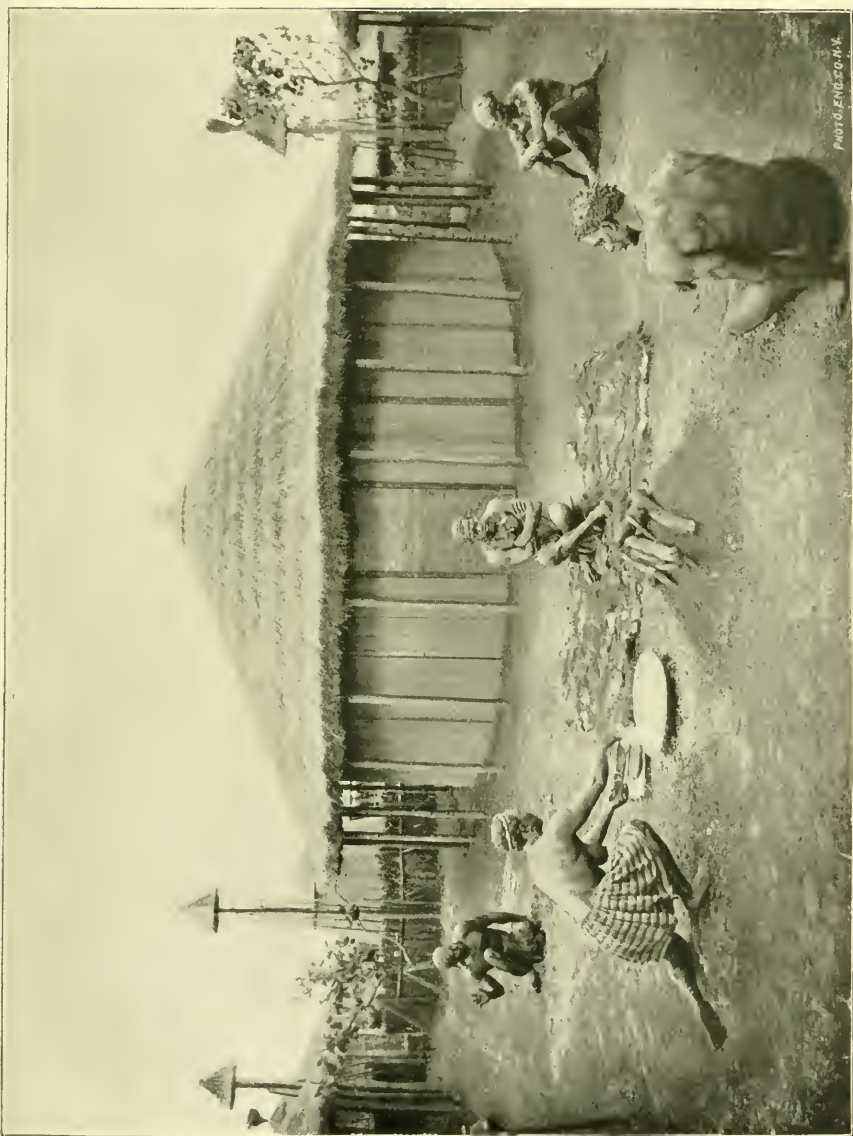




MATABELE WARRIORS IN THEIR ENCAMPMENT ; THE LATTER BUILT UP FROM THE ROOFS OF HUTS OF A MO-TOKO TOWN.  
SOUTH ZAMBESI TRIBE ; ZULU NATION.

Mounted under the direction of Dr. Emil Holub for the South African Exhibition, Prague, 1882.





ZULUS OF NEW SHESHEKE, ON THE CENTRAL ZAMBEZI, AT SUPPER.

[The food is tasted by the attendants before it is passed to the king, who is seated in the center of the picture.]  
Mounted under the direction of Dr. Emil Holub for the South African Exhibition, Prague, 1892.



Specimens in a museum are like the types in a printing office. They may be sorted in the cases in conventional order so as to be accessible when needed, or they may be used to make intelligible almost any train of thought or series of ideas, each being available in hundreds of different relationships.

Single or unrelated specimens, though valuable or interesting, are in themselves of little moment in comparison with series of much less precious objects which unite to teach some lesson to student or visitor.

*Cumbersome and superfluous materials in collections.*—One of the greatest perils to a museum is the possession of vast collections.

Collections which are encumbered with conditions as to manner of disposition and installation are usually causes of serious embarrassment.

Not the least important duty of the curator is to prevent the accession of undesirable material.

Material not germane to the plan of a museum should be exchanged or given to other museums which have use for it. What is expensive and unprofitable to one may be of the greatest use to another.

Advances in any museum are effected not only by accession and enlargement, but by the constant substitution of better specimens, by advance in methods of display, labeling, and handbooks.

*The principal uses of specimens.*—A museum is rarely justified in exhibiting all its materials. An exhibition series, when properly installed, is more effective when limited than when extensive.

Specimens not needed in the exhibition series are much more useful when placed in a reserve or study series, either to be used by students; to be exchanged or given to other museums, or to be employed when occasion may offer in forming new exhibition series.

*The exhibition series.*—The effectiveness of a museum for popular culture depends chiefly upon:

(1) A careful selection and effective arrangement of the specimens exhibited (which implies the exclusion of many objects in themselves attractive and interesting).

(2) A thorough system of labels in simple language, supplemented by pictures, diagrams, maps, and books of reference.

(3) Specimens for exhibition should be selected solely with reference to the lesson they can teach, singly or in combination.

(4) To complete a series, any specimen is better than none.

(5) A copy, model, or picture of a good thing is often more useful than an actual specimen of a poor one.

(6) A picture or model may often be shown to advantage in place of a minute or unintelligible object.

(7) Books, manuscripts, pictures, maps, etc., become specimens when treated in the museum method.

*The study series:*

(1) Specimens in the study series should be acquired in series suffi-

ciently large to meet the needs of students who are known to exist. While nothing of value should be lost, it is questionable whether material should be sought in large quantity, when there is no indication that it will soon be needed.

(2) Study specimens should be stored as compactly and economically as is consistent with their safety and convenient use, and should be accessible to every student.

(3) The study series is the storehouse from which the exhibition series may be replaced or extended and from which the needs of other museums may be supplied.

*Records.*—The most important fact concerning any object is the locality where it was found; next most important, the person from whom it was received. Every specimen should have its catalogue number indelibly engraved or marked upon it, and, when possible, the locality and source. Specimens can be named at any time, but the locality once lost, the object becomes comparatively valueless. The record of donors should be accurate and complete, so that the specimens from any given source can be traced at once to their location.



### III.—SPECIAL TOPICS OF THE YEAR.

#### THE UNUSUAL CHARACTER OF THE YEAR'S WORK.

The activities of the entire staff have been in a large degree diverted to exposition work, as they were last year and are likely to be for a year to come. Many of the Museum halls have been closed, being needed for the work of mounting and packing the collections. Many of our employees have been transferred to the exhibition staff, and at the time of this report are absent in Chicago, while a considerable number of others have been detailed for special service at the fair, or have been given special leaves of absence to attend the congresses or to act as judges of awards.

A large number of specimens and cases have been withdrawn from the exhibition halls and sent to the expositions in Madrid and Chicago, and it has required the utmost ingenuity to fill the gaps thus caused, so that the collections may be presentable in the eyes of the visitors, who are quite as numerous this year, and among whom are many from foreign lands.

Indeed, the occasion is really a revolution in museum affairs, and it will require fully a year after the return of the collections next winter to readjust the collections and to reestablish customary routine.

All of this is accepted without complaint, because, though the Museum undoubtedly loses much more than it gains on such occasions, the opportunity for popular education is too important to be neglected, and the anniversary is one for which no outlay of labor and expense can be too great.

The effect of this upheaval, extending as it has and will over a period of nearly four years, must, however, of necessity be manifest in this report, and it should be read with the facts just mentioned in mind.

The responsibility of the Assistant Secretary in preparing for the two expositions, and the completion of the report on the deep-sea fishes of the *Albatross* and *Blake* expeditions, and his long absence from the city on official duty, have rendered it impossible for him to attend, as usual, to the details of museum administration, except in connection with the present report. Mr. Frederick W. True, as curator in charge, has very faithfully and successfully directed the work of this unusually trying year.

#### CHANGES IN THE FORM OF THE ANNUAL REPORTS.

Each report upon the Museum is intended to convey to every one interested in its work, and especially to Congress, an exact idea of what has been done during the year, the relation of the work done to that of

previous years, and to the plans for the future. So far as it is deemed likely to be of public interest, reasons are always given for the course pursued, especially when there are changes in method and policy.

It is also intended to show fully what new museum materials have come into the possession of the Government during the year and how it has been assigned, what is being done to preserve and utilize the old collections, and when, in accordance with law, material has been distributed to other institutions, to show what has been done with it.

The report then must of necessity discuss hundreds of thousands of small details, and it is exceedingly difficult to handle them so systematically that the reference to anyone of these details can be at once found.

With the growth of the Museum the system has been becoming yearly more complicated, and the body of the report constantly more and more filled up with tables and statistical summaries.

In the attempt to avoid what is becoming a burden, many of the statements heretofore included in the main report have this year been placed in appendixes. The discussions of the gifts and other accessions have, so far as possible, been assembled in a special appendix under the control of indexes, which show not only the source but the disposition of each object by museum departments, and also group the objects by geographical origin.

Still further concentration has been made by doing away with the special reports of the curators upon their respective departments and incorporating their substance in the general report upon the progress of the Museum. This is an experiment, and it is not impossible that hereafter the old system may, at least in part, be resumed.

#### THE MUSEUM STAFF.

There are at the present time thirty-two organized departments and sections in the Museum under the care of curators and assistant curators, and eight administrative divisions.\*

The following changes in the personnel of the scientific departments have occurred during the year:

Dr. William S. Dixon, honorary curator of the section of *materia medica*, was detached by the Secretary of the Navy on January 5, 1893, for duty in the office of the Surgeon-General, and was succeeded by Dr. C. H. White, U. S. Navy.

Mr. W. S. Yeates, who has for many years filled the position of assistant curator of the Department of Minerals in the National Museum, resigned on June 14, 1893, to accept the post of State Geologist of Georgia.

Dr. George Vasey, honorary curator of the Department of Botany in the National Museum, died March 4, 1893, and Mr. Frederick V. Coville,

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\*A list of the scientific and administrative officers is printed in Appendix 1.

who succeeded him as botanist in the Department of Agriculture, has been placed in charge of the Department of Botany in the Museum. A fuller reference to Dr. Vasey will be found in a subsequent page.

Mr. J. E. Watkins, curator of the section of transportation and engineering in the National Museum, was granted leave of absence October 1, 1892, to take charge of the exhibit of the Pennsylvania Railroad Company at the World's Fair, and the work of collecting and organizing the historical collections shown by that railroad in Chicago has since occupied his time.

#### APPROPRIATIONS FOR 1893-'94.

The sum total of the appropriations is \$166,000, which is \$5,000 less than for the previous fiscal year, and \$47,500 less than for 1891-'92. The items are as follows:

#### MUSEUM APPROPRIATIONS FOR 1893-'94.

Preservation of collections.....	\$132,500
Furniture and fixtures.....	10,000
Printing.....	12,000
Heating and lighting.....	11,000
Postage.....	500
	166,000

It is a source of serious embarrassment that the appropriations have been reduced, and but for the fact that this reduction is part of a general system of economy growing out of the necessities of the Government, and affects all branches of the Government alike, it would be very discouraging. As it is, the situation has been accepted loyally and cheerfully; and though the growth of the Museum and its efficiency are of necessity greatly interfered with, the effort has been made to accomplish the best results with the means available, while waiting for a time of greater prosperity. One of the most serious inconveniences has been the necessity of discharging a number of men, who have been trained for the special work of the Museum, whose services are essential to its efficiency, and whom it will be difficult to replace in the future.

#### INCREASE IN THE COLLECTIONS.

At the close of 1881 a census of the collections was taken, resulting in the preparation of a table, published in subsequent reports, which gave 193,362 as the approximate total number of specimens of all kinds at that time entered in the catalogue books of the several departments of the Museum. The census for the year ending June 30, 1893, places the total number of specimens of all kinds at 3,306,020. It must, however, be stated that a large proportion of the material catalogued in 1884 and in later years had been in the custody of the Smithsonian Institution for several years, but had remained in storage on account of there being no opportunity to have it classified and entered in the catalogue books.

There still remains in the basement of the Smithsonian building and in the old Armory building much material, consisting largely of gifts from foreign governments and contributions from expositions, which has not yet been brought under control, owing to lack of space and other necessary facilities.

The number of accessions received in 1892-'93 was 1,266 (Acc. Nos. 25885 to 27150, inclusive), embracing, in all, 82,148 specimens, distributed among the several departments as follows:

Departments.	Number of specimens.
Arts and industries:	
Materia medica .....	27
Domestic animals (for mounting) .....	31
Historical collections, coins, medals, paper money, etc. ....	1,000
Musical instruments .....	263
Transportation and engineering .....	37
Modern pottery, porcelain, bronzes, etc .....	312
Physical apparatus .....	18
Graphic arts .....	260
Forestry .....	725
Ethnology .....	5,094
American aboriginal pottery .....	889
Oriental antiquities and religious ceremonial .....	458
Prehistoric anthropology .....	3,095
Mammals (skins and alcoholics) .....	728
Birds .....	2,255
Birds' eggs and nests .....	2,869
Reptiles and batrachians .....	2,301
Fishes .....	1,010
Vertebrate fossils .....	13
Mollusks (including Cenozoic fossils) .....	5,600
Insects .....	7,000
Marine invertebrates .....	2,690
Comparative anatomy:	
Mammals .....	630
Birds .....	
Reptiles and batrachians .....	
Fishes .....	
Invertebrate fossils:	
Paleozoic .....	1,200
Mesozoic .....	6,440
Fossil plants .....	2,000
Recent plants .....	33,110
Minerals .....	793
Geology .....	1,300
Total .....	82,148

The following table shows the number of accessions to the Museum, annually, since 1881:

Year.	Accession numbers (inclusive).	Number of accessions during the year.
1881.....	9890-11000	1, 311
1882.....	11001-12500	1, 500
1883.....	12501-13900	1, 400
1884.....	13901-15550	1, 650
1885 (January to June).....	15551-16208	658
1886.....	16209-17704	1, 496
1887.....	17705-19350	1, 646
1888.....	19351-20831	1, 481
1889.....	20832-22178	1, 347
1890.....	22179-22340	1, 162
1891.....	22341-24527	1, 187
1892.....	24528-25884	1, 357
1893.....	25885-27150	1, 266

A list of the accessions during the year, arranged alphabetically by names of contributors, and including indexes by locality and by departments, is printed as Appendix VI.

Special reference to the particularly valuable material obtained by foreign exchanges seems desirable.

*Ethnology.*—Mr. Henry Balfour, of the Ethnographic Museum of Oxford University, England, has sent a miscellaneous collection of ethnological objects.

Mr. William T. Brigham, curator of the Bernice Pauahi Bishop Museum, Honolulu, Hawaiian Islands, sent a collection of about 500 specimen samples of Hawaiian kapas, or tapa cloth, especially interesting as illustrating the great variety of paterus.

Mr. Edward Lovett, Croydon, England, sent ethnological objects.

From Prof. Henry H. Giglioli has been received a valuable and interesting collection of ethnological and other objects from the Andaman Islands. A collection of American ethnological objects has been sent in return.

*Prehistoric anthropology.*—Mr. Edward Lovett, Croydon, England, has sent a collection of stone implements, flints, human leg and arm bones, and fragments of crania obtained in England, Ireland, Germany, and Belgium, for which an equivalent has been sent.

From the Royal Zoological Museum, Florence, Italy (through Prof. Henry H. Giglioli, director), have been received fragments of pottery, shells, fragments of bone, and a piece of quartz from a kitchen-midden, near Port Blair, South Audaman, for which archaeological objects and publications have been transmitted.

*Birds.*—Dr. Robert Collett, director of the Zoological Museum, Christiania, Norway, sent specimens of fishes.

Mr. H. E. Dresser, London, England, sent 4 specimens of birds' skins, representing 3 species, principally from Japan, in return for specimens already sent by the National Museum.

Birds' skins have been sent to Mr. Louis Molnar, Molna Szecsöd Post, Egyháros, Hollós, Hungary, in return for similar material received from him.

From the Rev. H. B. Tristram, The College, Durham, England, have been received 3 specimens of birds' skins, representing 3 species from New Guinea, in continuation of an exchange.

*Fishes.*—From the Indian Museum, Calcutta, India (through Mr. A. Alcock, curator), have been received in exchange specimens of deep-sea fishes, collected by H. M. S. *Investigator*, types of his own recent papers.

*Mollusks.*—Mr. M. Cossmann, of Paris, sent fossils from the Paris basin, in return for Claiborne shell marl already transmitted by the National Museum.

From Mr. Hugh Fulton, of Chelsea, England, have been received shells representing 25 species, for which an equivalent has been sent.

*Insects.*—Mr. E. Brunetti, London, England, sent specimens of European diptera, representing 90 species, for which an equivalent has been returned.

Mr. H. du Buysson, Chateau du Vernet, per Brout Vernet (Allier), France, transmitted specimens of European diptera, hymenoptera, and coleoptera, representing 71 species, for which 69 specimens of *Ela-teridæ* have been sent in return.

From the Imperial Austrian Museum, Vienna, Austria (through Dr. Brauer, curator), have been received type specimens representing 98 species of European *Muscidæ*, illustrating Brauer and Bergenstamm's classification, in return for 230 specimens of American *Muscidæ* already transmitted.

*Marine invertebrates.*—From the Canterbury Museum, Christchurch, New Zealand (through F. W. Hutton, curator), have been received Ophiurans, representing 3 species, also 7 species of star fishes.

*Invertebrate fossils.*—From the Australian Museum, Sydney (through Dr. Edward P. Ramsay, curator), have been received Australian graptolites, in return for specimens of a similar character already transmitted by the National Museum. A specimen each of *Polyodon* and *Amia calva* have also been sent to the Australian Museum, in continuation of an exchange.

*Invertebrate fossils.*—Prof. A. Pavlow, Moscow University, Moscow, Russia, has sent a collection of Mesozoic fossils.

*Fossil plants.*—From the University of Upsala, Sweden (through Dr. Theo. Fries), has been received a large collection of herbarium specimens, chiefly from Brazil, for which an equivalent has already been sent.

*Botany.*—From Prof. S. E. Lassimonne, à Yseure (Allier), France, have been received dried plants from the interior of France, for which a return has been sent.

*Minerals.*—From the Munich Academy, Munich, Bavaria (through Prof. P. Groth), have been received minerals in return for specimens already transmitted.

The K. K. Hofmuseum, Vienna, Austria (through Dr. A. Brezina, custodian), transmitted minerals from various localities as an equivalent for specimens already transmitted.

*Geology.*—From the Munich Academy, Munich, Bavaria (through Prof. P. Groth), have been received rocks, in return for material already transmitted, and Mr. H. J. Johnston-Lavis has forwarded in exchange volcanic materials from Naples.

The following table shows the annual growth of the collections since 1882:

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Table showing annual increase in the collections since 1882.

Name of department	1882.	1883.	1884.	1885-86.	1886-87.	1887-88.	1888-89.	1889-90.	1891-92.	1892-93.
Arts and industries:										
Materia medica	4,000	4,442	4,850	5,516	5,762	5,942	6,083	6,290	6,317	
Foods	1,244	1,587	822	877	877	911	1,111	1,111	1,111	
Textiles		2,000	3,063	3,144	3,144	3,222	3,288	3,288	3,288	
Fisheries		5,000	9,870	10,078	10,078	10,078	10,080	10,080	10,080	
Animal products		1,000	2,792	2,822	2,822	2,948	2,994	2,994	2,994	
Graphic arts							600	974	1,174	1,434
Poetry										4,725
Transportation and engineering								1,250	1,472	1,737
Naval architecture		600					600	600	600	600
Historical relics			1,002	13,634	14,645	14,990	20,893	23,890	28,390	29,390
Coins, medals, paper money, etc.			1,005							
Musical instruments			400	417	427	427	447	542	636	809
Modern pottery, porcelain, bronzes, etc.			2,278	2,238	3,011	3,011	3,132	3,144	3,232	3,514
Paints and dyes			77	100	100	109	197	197	197	197
The Catlin Gallery			500	500	500	500	( )			
Physical apparatus			250	251	251	251	293	273	273	291
Oils and gums			197	198	198	213	1,112	1,112	1,112	1,112
Chemical products			659	661	661	688				
Domestic animals										
Ethnology		200,000	503,000	503,761	505,464	506,324	508,830	510,630	512,871	517,965
American aboriginal pottery		12,000	25,000	26,022	27,122	28,222	29,299	30,488	32,305	33,194
Oriental antiquities and religious ceremonial							850	3,485	3,487	3,945
Prehistoric anthropology	35,512	40,491	65,314	101,659	108,631	116,472	123,677	127,761	137,087	140,182
Mammals (skins and alcoholics)	4,600	4,920	7,151	7,811	8,058	8,275	8,836	9,301	710,387	11,046
Birds	44,351	47,246	50,350	55,945	54,987	56,484	57,974	60,219	68,416	70,671
Birds' eggs and nests		40,072	44,163	48,173	50,055	50,173	51,241	52,166	55,260	58,129
Reptiles and batrachians		23,495	25,344	27,542	27,664	28,405	29,050	29,935	30,949	33,240
Fishes	50,000	65,000	75,000	100,000	101,350	107,350	122,575	127,312	129,218	130,228
Vertebrate fossils								521	1,582	1,595
								512		



Mollusks.....	33,375	400,000	469,000	425,000	455,000	468,000	471,500	476,500	482,725	488,325
Insects.....	1,000	151,000	506,000	585,000	595,000	603,000	618,000	630,000	646,500	653,500
Marine invertebrates.....	11,781	14,825	350,000	450,000	515,000	515,300	529,000	526,750	533,870	536,560
Comparative anatomy:										
Osteology.....	3,535	3,640	4,214	11,022	11,558	11,753	12,326	12,981	12,555	13,185
Anatomy.....	70	103	3,000							
Paleozoic fossils.....	29,000	73,000	80,482	84,491	84,649	91,126	92,355	92,970	93,839	95,039
Mesozoic fossils.....		100,000	69,742	70,775	70,925	71,236	71,305	79,754	82,853	89,293
Cenozoic fossils.....		(Included with mollusks.)								
Fossil plants.....		4,624	7,429	8,462	10,000	10,178	10,507	10,685	110,685	112,685
Recent plants.....			30,000	32,000	38,000	38,450	39,654	41,801	134,001	167,111
Minerals.....		14,550	18,401	18,601	21,896	27,690	37,101	44,236	48,357	42,491,150
Lithology and physical geology.....	9,075	12,500	20,647	21,500	22,550	27,000	13,922,762	14,641,162	35,787	37,087
Metallurgy and economic geology.....		30,000	48,000	49,000	51,412	52,076				
Living animals.....					491		( <sup>b</sup> )			
Total.....	193,362	263,143	1,472,600	2,420,944	2,666,335	2,864,244	2,895,104	3,028,714	3,223,941	3,306,020

<sup>1</sup> No census of the collection taken for the six months ending June 30, 1885.

<sup>2</sup> The actual increase in the collections during the year 1889-'90 was much greater than appears from a comparison of the totals for 1889 and 1890. This is explained by the apparent absence of any increase in the departments of Ichthyology and Metallurgy, the total for 1890 in both of these departments combined showing a decrease of 46,314 specimens, owing to the rejection of worthless material.

<sup>3</sup> Although about 200 specimens have been received during the year, the total number of specimens in the collection is now less than that estimated for 1889, owing to the rejection of worthless material.

<sup>4</sup> No estimate of increase has been made since 1889.

<sup>5</sup> This is slightly in excess of the actual number of specimens on hand June 30, 1892.

<sup>6</sup> The total number of specimens in the department of birds in 1890-'91 was 62,806 instead of 62,601.

<sup>7</sup> Only a small portion of the collection represented by this number was received during the year 1889-'90.

<sup>8</sup> The decrease in this department for the year 1891-'92 was occasioned by the transfer of a large number of skeletons to the department of vertebrate fossils.

<sup>9</sup> Up to 1890 the numbers have referred only to specimens received through the Museum, and do not include specimens received for the National Herbarium through the Department of Agriculture.

<sup>10</sup> The figures given for 1890-'91 include, for the first time, the number of specimens received both at the National Museum and at the Department of Agriculture for the National Herbarium.

<sup>11</sup> During the year the curator and assistant curator have been unable to do any collecting by reason of other pressing work. This accounts for the fact that the increase in the collection is much less than during preceding years.

<sup>12</sup> Collections combined in October, 1889, under the department of geology.

<sup>13</sup> The apparent decrease of more than 30 per cent of the estimated total for 1889 is accounted for by the rejection of several thousands of specimens from the collection, and (2) by the fact that no estimate of the specimens in the reserve and duplicate series is included in this number is, in reality, far in excess of the actual number of specimens available for exhibition and study, several thousand specimens having been discarded.

<sup>14</sup> Transferred to the National Zoological Park.

NOTE 1.—In compiling the annual statement of increase, allowance has not been made for the decrease in some of the collections, caused by distribution of duplicates or elimination of worthless material. It thus happens that the total number of specimens as given by the curators in their annual reports does not agree in all cases with the totals printed in this table.

NOTE 2.—The fact that the figures for two successive years relating to the same collection are unchanged does not necessarily imply that there has been no increase in the collection, but that for some special reason it has not been possible to obtain the figures showing the increase.

## CATALOGUE ENTRIES.

The entries made in the catalogue of the departments during the year have numbered 19,768. This is less than one-half of the number for 1892, but the decrease in this direction is readily accounted for by the fact that most of the curators were busily occupied during the entire year with the preparation of exhibits for the World's Columbian Exposition, and that all collections received have not yet been catalogued.

The following table shows the number of entries made in each department of the Museum:

Departments.	Number of entries.
Arts and industries:	
Materia medica .....	26
Domestic animals (for mounting) .....	31
Musical instruments .....	251
Transportation and engineering .....	31
Modern pottery, porcelain, bronzes, etc .....	304
Graphic arts .....	254
Forestry .....	33
Ethnology .....	3,161
American aboriginal pottery .....	249
Prehistoric anthropology .....	465
Mammals (skins and alcoholic) .....	1,344
Birds .....	491
Birds' eggs and nests .....	765
Reptiles and batrachians .....	2,301
Fishes .....	418
Vertebrate fossils .....	13
Mollusks (including Cenozoic fossils) .....	4,578
Insects .....	219
Marine invertebrates .....	962
Comparative anatomy:	
Mammals .....	6.0
Birds .....	
Reptiles and batrachians .....	
Fishes .....	
Paleozoic fossils .....	159
Mesozoic fossils .....	790
Fossil plants .....	29
Recent plants .....	567
Minerals .....	348
Geology .....	1,349
	19,768

COOPERATION OF THE EXECUTIVE DEPARTMENTS  
OF THE GOVERNMENT.

The growth of the Museum has always depended to a considerable degree upon the friendly cooperation of the various Executive Departments, and the encouragement which they have given to their officers to assist in the increase of the collections and to some extent in their administration.

With the exception of the special Museum of Hygiene maintained by the Navy Department and the Army Medical Museum, the nucleus of which are the surgical and pathological collections developed in the course of the preparation of the medical and surgical histories of the war, no departmental museums have been formed, and the collections which have incidentally resulted from their activities have been promptly transferred to the custody of the Smithsonian Institution.

The association of the Museum with the scientific bureaus whose work requires the use of Museum material, has always been intimate and friendly.

The collections of the Geological Survey are deposited in the Museum and incorporated with the general collection, while the interests of both establishments are advanced through the detail of certain of the scientific investigators connected with the Survey, to act as curators or custodians of the combined collections. In this way, Prof. Marsh, Mr. Walcott, Dr. White, Prof. Ward, and Prof. Clarke are attached to the scientific staff of the Museum.

Between the Fish Commission and the Museum a similar and even more intimate relationship exists, since the Museum undertakes to publish all the results of work upon the Fish Commission collections, except those which relate to economic fishes, or, have in some way a positive economic value. Dr. Rathbun and Dr. Bean, officers of the Fish Commission, have been for many years in charge of departments in the Museum.

With the Department of Agriculture the same kind of alliance has always existed. The National Herbarium, the depository of all the plants belonging to the Smithsonian Institution, as well as those which have been obtained by the Department of Agriculture, is under the charge of Mr. Coville, botanist of the Department and also an honorary curator in the Museum, and this collection is deposited in the Department of Agriculture. The insects, on the other hand, with relation to which Prof. Riley, the entomologist of the Department, holds a similar relationship, are in the Museum. The collections of the division of Economic Ornithology and Mammalogy are also deposited in the Museum, and are under the general control of Dr. C. Hart Merriam, chief of the division, who is practically, though not nominally, a member of the Museum staff. The chief of the Forestry Division of the Department, Dr. Fernow, is in charge of the somewhat chaotic mass of material illustrating the methods of forestry and the woodworking industries, which has as yet no definite place in either establishment.

The Department has a temporary museum in a wooden building upon its own reservation, in which are placed on view a large number of objects of interest to agriculturists, and which is the source of the material which the Department is often called upon to exhibit at expositions. A considerable mass of technological material is also kept in the National Museum, chiefly in storage, awaiting the time when it shall be

found practicable to build up a technological collection in connection with the museum system of Washington.

Until within a few years, a military museum was maintained in one of the buildings belonging to the War Department. When this was abandoned in 1888, its contents were distributed among the armories and arsenals throughout the country, in each of which some sort of museum is maintained, but a considerable remainder, of a purely historical character, was transferred to the National Museum.

The old "National Cabinet of Curiosities" was long in charge of the Interior Department, this arrangement dating from the days when the old National Institute occupied a room in the so-called Patent Office building. This was transferred in 1858 to the Smithsonian Institution, but a thread of administrative connection still attached the Museum to the Department of the Interior until 1888, when, as narrated in the Report of the Museum for that year, the Secretary of the Interior, having investigated the law, decided that he had no official responsibility in connection with the Museum, and that the entire control should be left to the Smithsonian Institution.

These facts are mentioned simply to show that, by general consent, the museum interests of the Capital are becoming yearly more concentrated, in accordance with the manifest intent of Congress in the act establishing the Smithsonian Institution.

It seems proper in each Annual Report to make special acknowledgment of the kindly cooperation of the Executive Departments in the general work of the Museum.

The Department of State has, as always in the past, encouraged its consular officers to make collections, and has transmitted with favorable recommendations every request in behalf of the Museum, and these officers have almost without exception responded enthusiastically to the requests made of them. From such cooperation as this the Museum has everything to hope in the future, and were it possible to expend a few thousands of dollars through the consular service each year, additions of wonderful value might be obtained from every quarter of the globe.

Among those who have rendered special service during the past year should be mentioned Mr. Henry Andrews, U. S. Consul, Hankow, China; Mr. R. M. Bartleman, U. S. Legation, Carácas, Venezuela; Hon. Truxton Beale, U. S. Consul-General, Teheran, Persia; Mr. Erhard Bissinger, U. S. Consul, Beirut, Syria; Hon. S. H. M. Byers, U. S. Consul-General, St. Gall, Switzerland; Mr. J. Lyall, acting U. S. Consul, Singapore, Straits Settlements; Mr. Lewis Dexter, U. S. Consul, Fayal, Azores; Mr. Louis B. Grant, acting U. S. Consul-General, Cairo, Egypt; Mr. Augustine Heard, U. S. Consul-General, Seoul, Korea; Mr. Frank von Phul, Vice-Consul, San Juan del Norte, Nicaragua, and Mr. Alexander Webb, U. S. Consul, Manila, Philippine Islands. The character of their contributions is described under their respective names in the list of acces-

sions in Appendix VI, as is the case also of those of the other persons mentioned in this same connection.

The Treasury Department has rendered most important service by facilitating the entry of material from foreign countries through the custom-house. In this connection special acknowledgments are due to Mr. John Quackenbush, by whom the packages received through the New York custom-house have been forwarded, in connection with his voluntary services as New York agent of the Smithsonian Institution. The following officers of the Treasury have been especially efficient in their efforts to increase the collections of the Museum: Dr. S. J. Call, U. S. Revenue Marine Service; Mr. J. A. Clampitt, U. S. Life-Saving Service; Mr. J. Q. Larner, Bureau of Engraving and Printing, and Mr. J. Henry Turner, U. S. Coast and Geodetic Survey.

Under the War Department the Quartermaster-General of the Army has greatly aided the Museum by furnishing transportation for bulky and cumbersome collections from the Western States, which without this assistance it would have been almost impossible for the Museum to have acquired. To Capt. John F. Rogers, U. S. Army, of the Quartermaster's Department, is due especial acknowledgment for his supervision of the transportation of the Museum World's Fair material from Washington to Chicago. The following-named officers of the Army have made valuable contributions: Dr. Timothy E. Wilcox, major and surgeon; Dr. J. C. Merrill, captain and assistant surgeon; Dr. Edgar A. Mearns, captain and assistant surgeon; Capt. John G. Bourke, Capt. Charles E. Bendire, Capt. Henry Romeyn, Capt. Sawyer, Lieut. H. C. Benson, Lieut. Wirt Robinson, and Dr. R. W. Shufeldt.

To the Navy Department acknowledgment is due for the detail of a medical officer to act as curator of the section of materia medica, while the following-named officers have contributed to the collections: Lieut. G. T. Emmons, Lieut. C. F. Pond, Ensign W. E. Safford, Dr. C. H. White, Messrs. J. S. Carpenter, A. S. Greene, and W. S. Moore.

Under the Department of the Interior, with the exception of the specimens contributed by Dr. Z. T. Daniel and Mr. Charles H. Thompson, officials of the Indian Office, the chief assistance has been from the U. S. Geological Survey. The extent of the accessions from this source is fully shown in the list of accessions, and special acknowledgments are also due the following officers of the Survey for their hearty cooperation: Maj. J. W. Powell, director; Mr. C. D. Walcott, Mr. Frank Burns, Prof. F. W. Clarke, Mr. Whitman Cross, Dr. J. S. Diller, Mr. B. K. Emerson, Mr. S. F. Emmons, Dr. W. F. Hillebrand, Dr. W. P. Jenney, Mr. L. C. Johnson, Dr. W. H. Melville, Dr. A. C. Peale, Prof. S. L. Penfield, Prof. I. C. Russell, and Dr. R. E. C. Stearns.

Several large and interesting collections have been received from the Department of Agriculture, its officers, and persons officially connected with it. A full report of the transmissions will be found in the list of accessions. The names of the contributors of collections are given in

the following list: Dr. C. Hart Merriam, Prof. C. V. Riley, Mr. F. L. J. Boettcher, Dr. A. K. Fisher, Mr. Albert Hassall, Mr. Frank H. Hitchcock, Mr. Theodore Holm, Mr. J. F. James, Dr. George Marx, Dr. E. Palmer, Mr. E. A. Preble, and Mr. H. E. Van Deman.

The U. S. Fish Commission is so closely associated in its work with the Museum, and each year contributes so extensively to its collections, that it seems almost impossible to make special acknowledgments apart from those in the list of accessions. Reference must however be made to the assistance rendered by the following officers of the Commission: Col. Marshall McDonald, U. S. Commissioner of Fisheries; Dr. Richard Rathbun, Dr. T. H. Bean (both honorary curators), Mr. Vinal N. Edwards, Prof. B. W. Evermann, Dr. R. R. Gurley, Dr. Hugh M. Smith, Mr. C. H. Townsend, and Mr. S. G. Worth.

Since the Bureau of American Ethnology is, like the National Museum, a branch of the Smithsonian Institution, it is scarcely perhaps proper to refer to it under this head, except to say that its entire staff is constantly in cooperation with that of the Museum. During the past year special contributions have been received from the following persons connected with the Bureau: Maj. J. W. Powell, director; Mr. F. H. Cushing, Dr. A. S. Gatschet, Mr. H. W. Henshaw, Mr. F. Webb Hodge, Dr. W. J. Hoffman, Mr. James Mooney, and Mr. James C. Pilling.

#### SPECIAL EXPLORATIONS.

During the year special collections from various parts of the world have been made by explorers who have offered their services to the Smithsonian Institution, and many of whom have been supplied with instruments and materials for collecting.

Among the most interesting groups of objects sent in from abroad are those collected by Dr. W. L. Abbott in Kashmir and other parts of India; from the Seychelles, from Aden, and from Aldabra, Glorioso, and the adjacent islands. Dr. Abbott is a man of private means, whose interest in exploration and in field sports is happily supplemented by great enthusiasm for natural history work. His collections cover every branch of natural history, as well as ethnology, and are sent to the Museum with the understanding that they shall be promptly studied and described and the results published. A number of papers descriptive of his collections have already appeared, and others are in preparation. Dr. Abbott has previously sent much important material from Kilima-Njaro and other important localities in Africa.

Equally important have been the explorations of a similar character made by Mr. William Astor Chanler, of New York City, who has already sent in extensive ethnological, zoological, and botanical collections from Mashonaland, the Tana River, and other localities in East Africa.

Mr. H. C. Moore, while making explorations in South Africa, obtained a valuable collection of skins, skulls, and horns of antelopes and other large animals.

The Hon. William Woodville Rockhill, Third Assistant Secretary of State, brought with him from Tibet, as the result of his explorations under the auspices of the Smithsonian Institution, a most valuable collection of ethnological objects, which were acquired by the Museum, and a special catalogue of which is published in this volume.

Mr. P. L. Jouy, of the National Museum, was sent to Mexico to make special natural history collections.

Among the explorers within the limits of the United States, Dr. Edgar A. Mearns, U. S. Army, who is attached to the Mexican Boundary Commission, deserves special mention. Dr. Mearns has been furnished with every appliance for natural history work in the field, and at the request of the Museum has received special facilities for scientific work, and the material sent in by him, as shown in the list of accessions and the curators' reports, is of great value to science.

Prof. George P. Merrill, Mr. Barton A. Bean, and Mr. William Palmer, of the Museum staff, have also made collections in the field.

No allusion is made at this time to the important collections obtained especially for the exhibit of the Bureau of Ethnology and the Museum at the World's Fair. These will be referred to in the report of next year.

Offers to collect specimens are frequently received from persons contemplating a visit to some remote portion of the United States or to foreign countries. In the event that the locality is one from which material is desired, the National Museum has always been glad to supply collecting outfits, consisting of ammunition, traps, tanks, alcohol, etc. In this way a considerable amount of valuable material has been added to the collections, and the thanks of the Museum are due to its many friends who have thus exerted themselves in its behalf.

During the past year collecting outfits and materials of various kinds have been sent to the following persons: Mr. Harlan I. Smith, Madisonville, Hamilton County, Ohio; Dr. Edgar A. Mearns, U. S. Army, International Boundary Commission, Bisbee, Ariz.; Mr. R. M. Bartleman, U. S. legation, Carácas, Venezuela; Mr. C. W. Richmond, Greytown, Nicaragua; Mr. J. H. Camp, Leopoldville, Congo District, Africa; Mr. Henry D. Wolfe, Valparaiso, Chile; Mrs. F. E. B. Latham, Micco, Brevard County, Fla.; Mr. Mark B. Kerr, Tumaco, Colombia; Dr. Einar Lönnberg, Orlando, Fla.; Prof. S. E. Meek, Fayetteville, Ark.; Mr. Frank X. Holzner, Nogales, Sonora; Mr. H. C. Ganter, Mammoth Cave, Kentucky; Dr. R. P. Bigelow, Kingston, Jamaica; and Dr. Leonhard Stejneger, of the National Museum.

#### DEVELOPMENT AND ARRANGEMENT OF THE EXHIBITION SERIES.

The overcrowded condition of the exhibition halls, which has been referred to in the annual reports for the past few years, continues to exist, and although it has been impossible to undertake any radical improvements looking toward the extension and rearrangement of the collections on exhibition, many minor alterations have been made.

The collections of oriental antiquities and religious ceremonial were temporarily removed to the east hall, next to the rotunda. The work of labeling the specimens on exhibition in the section of graphic arts has been continued and is now nearly finished. Additions have been made to the collection, but no new series have been begun. It was found necessary, owing to the crowded condition of the north hall, to place in temporary storage the entire collection of medals and coins. The collection of historical objects now on exhibition includes autograph papers and personal relics of many of the Presidents of the United States, and of soldiers, statesmen, and other eminent Americans, as well as memorials of important events in the history of the country. A number of specimens were withdrawn from the exhibition series in the section of transportation and engineering for exhibition at the World's Columbian Exposition, among them the locomotive "John Bull" and the valuable collection of early typewriting machines. In the section of materia medica some new material has been placed upon exhibition during the year, and the condition of the collection is very satisfactory.

The installation in the mammal hall of a collection of mounted heads of African antelopes, deposited by Mr. William Astor Chanler, has been commenced, and a few specimens have been purchased to fill gaps in the exhibition series.

In the department of birds a number of new specimens have been placed on exhibition. The work of mounting and labeling the collection of vertebrate fossils has been carried on during the year. The preparation of a series of restorations of extinct animals of North America is in progress, a number of specimens having already been completed. It is proposed to utilize the wall space above the cases for their exhibition. The work of arranging the material in the department of mollusks has been finished, and the collection now presents a very satisfactory appearance. A large portion of the exhibit series was sent to the World's Fair, requiring the preparation of fifty-six boxes of native and exotic species, from the duplicates, to take their place. A new series of North American insects, comprising 181 species, was placed on exhibition in the early part of the fiscal year. The collection of the department of marine invertebrates was overhauled after the completion of the repairs in the west hall of the Smithsonian building. Considerable time has been devoted to filling up gaps in the exhibition series in the department of comparative anatomy, and the collection of mammal skeletons is now nearly complete. The preparation of some new series for the exhibition hall is under consideration.

A large quantity of material was temporarily withdrawn from the exhibition series in the department of minerals for the World's Columbian Exposition. At the close of the exposition these specimens will be restored to their old places and new material will be added, involv-



ing a general rearrangement of and a considerable increase in the exhibition series. The material sent by the department of geology to the World's Columbian Exposition was prepared with a view to making it fill a definite place in the collection when returned. A large proportion of the time of the curator has been devoted to the exhibition series, and important improvements have been made in the manner of displaying specimens in the table cases.

#### LABELS.

During the fiscal year ending June 30, 1893, there were printed, 10,814 descriptive labels (aggregating nearly 250,000 copies), or more than double the number usually printed in the course of a year. The large increase was caused chiefly by the necessary preparation of labels for the exhibit of the Museum at the World's Columbian Exposition at Chicago. All the departments of the Museum were represented in the series.

#### LIBRARY.

The Museum maintains a working library, covering the fields of zoology, botany, paleontology, geology, geography, anthropology, archaeology, and the arts. This library is kept in the Museum buildings, and is quite distinct from the general library of the Smithsonian Institution, which is deposited in the Library of Congress, which it to a certain extent duplicates. A large proportion of the books in the Museum library are lent by the Institution. During the past year the number of publications added to the library was 501 volumes of more than 100 pages, 1,457 pamphlets, besides parts of serials, of which 272 volumes, 821 pamphlets, and 6,981 parts of serials were those temporarily retained for the use of the Museum from the accessions of the Smithsonian Institution. The remainder were obtained by gift, exchange, or purchase.

In connection with the central library of reference, nearly every department has its own "sectional" or working library. The largest of these are the sectional library of geology with 1,400 titles, of entomology with 1,200, of ornithology with 880, of oriental antiquities with 862, and of mineralogy with 650.

#### CONTRIBUTIONS OF THE YEAR TO SCIENTIFIC LITERATURE.

A large number of papers upon scientific subjects have been published by officials of the Museum and other specialists. These are, for the most part, based on collections in the Museum, and are referred to by title in the bibliography, Appendix VII. The authors of these papers are ninety-two in number, thirty-seven of whom are connected with the Smithsonian Institution or the National Museum. The papers

referred to in the bibliography number 341, and relate to the following subjects:

Subjects.	By Museum officers.	By other investi- gators.
Administration.....	1	
American aboriginal pottery.....	1	
Archæology.....	12	
Biography.....	3	1
Birds.....	20	23
Chemistry.....	1	
Comparative anatomy.....	1	
Ethnology.....	10	7
Fishes.....	16	13
Fossils.....	33	6
Geology.....	14	2
Graphic arts.....	6	
Historical collections.....	1	
Insects.....	40	11
Mammals.....	3	4
Marine invertebrates.....	3	3
Materia medica.....	1	
Mineralogy.....	3	
Mollusks.....	15	3
Oology.....	1	
Oriental antiquities and religious ceremonial.....	6	
Plants.....	12	20
Reptiles and batrachians.....	6	8
Transportation and engineering.....	3	
Miscellaneous.....	21	7
Total.....	233	108

#### PUBLICATIONS OF THE MUSEUM.

The publications are issued in four series, as follows:

*Annual report.*—This report constitutes the second part of the report of the Smithsonian Institution to Congress, and, commencing with the year 1881, has been printed as a separate volume. The reports for 1881, 1882, and 1883 were printed in the reports of the Smithsonian Institution for those years, and were reprinted in pamphlet form. The series of Annual Reports of the Museum now consists of nine volumes (1884-'92, inclusive).

It is customary to send a copy of the report to each person who has sent specimens to the Museum during the year.

In the appendix to each volume are printed papers, usually illustrated, and based upon, or explanatory of, collections in the National Museum. A limited edition of each paper is printed in separate form for special distribution, and is found especially useful in the encouragement of gifts and in exchange for publications.

The edition of the report, which was in 1890 10,000, and in 1891 19,000, was in 1892 reduced to 10,000, thereby greatly diminishing its usefulness. Of the 10,000 now printed, 7,000 copies are for the use of the Institution and the Museum, the remaining 3,000 copies being

reserved for distribution by Senators and Representatives. The report is sent to about 4,000 libraries at home and abroad, to contributors to the collections, and to the correspondents of the Museum who are interested in its welfare.

*Proceedings.*—The series of "Proceedings of the U. S. National Museum" was begun in 1878, and was established for the purpose of securing prompt publication of discoveries in the Museum, and is printed in octavo. Vols. I and II were reprinted in Vol. XIX of the "Miscellaneous Collections of the Smithsonian Institution," and Vols. III and IV were reprinted in Vol. XXII of that series. This method of reprinting was, however, not carried beyond the fourth volume. Each article in the series has its special number, and the total number published up to August 1, 1894, was 1,000.

Since the beginning of Vol. XII, commencing with No. 761, the papers in this series have been printed separately, in advance of the publication of the bound volume, and have been distributed among specialists interested in the topics discussed.

The complete volumes are reserved for public institutions and libraries.

*List of volumes of Proceedings.*

Volume.	Year.	Pages.	Plates.	Text figures.	Papers.
I.....	1878	iv, 520	8	5	1-61
II.....	1879	iv, 499	7		62-101
III.....	1880	v, 589	2		102-184
IV.....	1881	v, 676	1	13	185-256
V.....	1882	xi, 703	12	52	257-342
VI.....	1883	vii, 530	14	10	343-396
VII.....	1884	viii, 661	2		397-469
VIII.....	1885	viii, 729	25	12	470-548
IX.....	1886	viii, 714	25	5	549-598
X.....	1887	viii, 771	39	11	599-675
XI.....	1888	xi, 703	60	145	676-760
XII.....	1889	vii, 686	23	14	761-789
XIII.....	1890	viii, 665	38	11	790-841
XIV.....	1891	vi, 750	34	3	842-886
XV.....	1892	vi, 508	84	5	887-918
XVI.....	1893	x, 808	84	13	919-975

Vol. XVII, for 1894, was in progress of publication when the manuscript of this report was sent in, and is now in press. Papers 976-1000, which form parts of this volume, had already been published separately.

*The Bulletin.*—The publication of the "Bulletins of the U. S. National Museum" was commenced in 1875 for the purpose of illustrating the collections of natural history and ethnology belonging to the United States. Forty-six numbers have been printed, all in octavo.

The first 16 numbers of the Bulletin were reprinted in Vols. XIII (Nos. 1-10), XXIII (Nos. 11-15), and XXIV (No. 16) of "Miscellaneous Collections of the Smithsonian Institution," and were distributed in this form

to institutions and libraries, but this method of reprinting and distribution has been discontinued.

*The Special Bulletins.*—The “Special Bulletin of the U. S. National Museum,” a series in quarto, corresponding to the “memoirs” of many similar establishments, was established in 1892 for the publication of elaborate, illustrated monographs.

#### LIST OF SPECIAL BULLETINS.

No. 1. Life Histories of North American Birds, with special reference to their breeding habits and eggs. By Maj. Charles Bendire, U. S. Army., pp. i–viii, 1–446. Plates i–xii. 1892. This work treats of the game birds, pigeons, and birds of prey, the arrangement adopted being that of the American Ornithologists' Union.

No. 2. Oceanic Ichthyology. By G. Brown Goode and Tarleton H. Bean. (In press.) An exhaustive monograph of the deep-sea fishes of the world. The volume will contain upward of 600 pages and will be accompanied by an atlas of 123 plates, with more than 400 figures of deep-sea fishes.

At the time of sending the present volume of the annual report to press the papers published in the Proceedings (including those belonging to the sixteenth and seventeenth volumes, which have been issued in separate form or are in type) have reached the number of 1,000, and it is intended in a later report to print a list of all papers, with annotations and indexes, based upon Museum material, which have been published by the Museum, as well as by other departments and bureaus of the Government.

#### TYPE SPECIMENS.

Those specimens which have been actually in the hands of investigators engaged in original research, and especially those which have been described in the establishment of new species and genera, and have furnished the material for illustration, are recognized by all museums as the most precious among their possessions. They form a part of the archives of science; they are the vouchers for the accuracy of the investigator who has studied the material, and are invaluable to subsequent students as a means for testing the accuracy of his conclusions. They are, therefore, the foundation stones of the fabric of natural science, and it is impossible to be too careful in preserving them.

The value of types is at present differently estimated in the several branches of natural history, but with the adoption of the stricter methods of modern work, and of more strenuous rules in regard to priority in nomenclature, the value of types will constantly be more highly appreciated. Unique specimens are, by common consent, priceless. It often happens that investigators in other cities need to refer to types, and applications are often made for their loan from our collection. The Museum has always endeavored to aid its collaborators in their researches by placing collections at their disposal for study, and it seems ungracious to refuse such requests, especially when they come from those who have lent types to us and are willing to do so in the future. Still, the subject is a serious one, and it seems time that a

strong position should be taken, not only for the security of the treasures in our own custody, but also to encourage other institutions to care better for their own. It should also be said that a knowledge of the fact that a given museum surrounds its types with the strongest safeguards will lead investigators not connected with public museums to place their types in its custody, and that the concentration of all types in a few large museums will be extremely advantageous to science.

With these considerations it has been determined to establish certain provisional regulations governing the preservation and loan of type specimens belonging to the National Museum. The collaborators of the Museum will not be restricted in their study of type specimens further than may be necessary to insure their proper care. These regulations are as follows:

- (1) Each curator is responsible for the type specimens in his custody.
- (2) No types will be lent, or allowed to be taken out of the building, exceptions being made only in the case of a limited number of museums with which arrangements have been made for the interchange of type specimens.
- (3) Every type specimen in the National Museum should be distinguished by a peculiar label.\*
- (4) A special book should be kept by each curator in which all the types under his custody should be entered under their catalogue numbers, with full data, including a reference to the place of description.
- (5) In the annual report of each department a statement should be made concerning the condition of the types in its custody.
- (6) When, in the judgment of a curator, it is necessary for the safety of the types in his custody that they be kept in a separate case, arrangements will be made to enable him to do this, and curators are requested to call attention to such necessity whenever it arises. They will be held responsible for injury to type specimens resulting from a failure to take precautionary measures of this kind.
- (7) The collection of types in the National Museum will be open to inspection and study by any investigator. Curators may, however, impose such restrictions as they deem necessary to protect themselves from losses for which they are by these regulations held responsible, provided that the free use of the material, under the provisions already laid down, is in no way impeded thereby.

In future discussions of this subject it may be said that a *type* in the strictest sense of the word is one which has been used by the author of a systematic paper as the basis for detailed study, and as the foundation of a specific name. In cases where a considerable number of specimens have been used, it is desirable to separate one or more as being the *primary* types, while the other specimens which may have been used in the same study for the purpose of comparison, may be regarded as *collateral* types. It will not always be necessary to apply the same rules to the use of the collateral types as to the primary types. The importance of a type is, of course, greatly increased when it has been used by a succession of authorities, and it is important that the data regarding such use should be carefully recorded.

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\*NOTE.—In the department of mammals and of birds a red label is used, and it is suggested that, as far as possible, a similar label should be used in the other departments.

## MATERIAL LENT FOR INVESTIGATION.

It has always been one of the aims of the National Museum to aid, as far as possible, persons who are engaged in scientific investigation. A few of the more important transactions of this character are here mentioned.

A number of specimens of insects of the genus *Trypoxylon* and family Pemphredonidæ were sent to Mr. William Fox, of the Academy of Natural Sciences, Philadelphia, to be used in the preparation of a review, which was afterwards published in the Transactions of the American Entomological Society. The African Myriapods, collected by Dr. Abbott, were sent to Mr. O. F. Cook, Huntington, N. Y., for study and special report. Forty-two specimens of birds of the genera *Myrmeciza*, *Syallaxis*, *Empidochanes*, *Myiarchus*, *Thryothorus*, and *Basileuterus* were sent to Mr. Frank M. Chapman, of the American Museum of Natural History, New York City, to be used in the preparation of a paper on the birds of the island of Trinidad.

A number of specimens of Scorpænoid fishes were lent to Prof. C. H. Eigenmann, Bloomington, Ind. There were forwarded to Lieut. Wirt Robinson, Atlanta, Ga., specimens of birds forming part of a collection made by him in Curaçao and on the coast of Colombia. This material was desired for use in the preparation of an illustrated work on the ornithology of the region indicated. Skins and skulls of field, meadow, and harvest mice were lent to Dr. J. A. Allen, of the American Museum of Natural History, New York City; also specimens of the Thamnophiline genus *Dysithamnus*, for comparison. Twenty-one specimens, representing 17 species of birds, were sent to Mr. Osbert Salvin, London, England, for examination in connection with the preparation of Vols. XVI and XXI of the Catalogue of Birds of the British Museum. They are mentioned specifically in the latter volume. One hundred and four specimens of birds were lent for examination to Mr. Witmer Stone, of Philadelphia, Pa. These were to be used in the preparation of a paper on the Birds of British Columbia, based on a collection made by Mr. S. N. Rhoads. Skulls of bats were sent to Dr. Harrison Allen, of Philadelphia, who is engaged in the preparation of a monograph on the North American species.

Dr. A. S. Packard, of Providence, R. I., who has been engaged in the study of the North American Bombycid moths, was allowed free access to the Museum collections, and such species as required a more detailed study were forwarded to him. Extended anatomical researches have been made by Prof. E. D. Cope, in connection with his new ophiological system. Prof. F. W. Goding, of Rutland, Ill., has been aided in his study of Fitch's types of insects. The collection of fossil plants from the Trinity rocks, near Glen Rose, Tex., were studied by Prof. William M. Fontaine, of the University of Virginia, who made an elaborate report on the same. Dr. Samuel H. Scudder, of Cambridge, Mass., has been engaged in an investigation of the Orthoptera of the Galapagos Islands. The work of Dr. O. P. Hay on the Indiana reptiles was completed during the present year. The skulls of bears and fur

seals in the Museum collection were studied by Dr. C. Hart Merriam, U. S. Fur-seal Commissioner, in connection with the Bering Sea controversy.

The Museum collection of plants in alcohol was temporarily transferred to the Department of Agriculture for the use of Mr. Theodor Holm in connection with his studies on the life histories and growth of North American plants. The sponges belonging to the Museum collection of the family Hexactinellidæ, collected in the Pacific Ocean by the steamer *Albatross*, have been sent to Prof. F. E. Schulz, of Berlin, who is preparing a revision of the group. He will submit a paper, based on an examination of these specimens, for publication in the Proceedings of the Museum. Arrangements have also been made with Dr. Axel Göes, of Sweden, to study the Foraminifera collected in the Gulf of Mexico, the Caribbean Sea, and the Pacific Ocean. and with Mr. John Murray, of Edinburgh, to study certain deep-sea deposits obtained by the Fish Commission steamers.

#### THE USE OF THE GOVERNMENT SCIENTIFIC COLLECTIONS BY STUDENTS.

Congress, by a joint resolution approved April 12, 1892, has formally thrown open all the literary and scientific collections in Washington for the use of students, with the definitely avowed purpose of encouraging the establishment and endowment of institutions of learning at the National Capital.

This most important and liberal action is in accord with the tendency toward the establishment in Washington of a great national university, or of a group of institutions practically national in their scope, for the advancement of higher learning.

The new law does not in any respect modify the attitude of the Smithsonian Institution and National Museum, for from the very beginning students and investigators have been welcomed and given every facility for their work, and within the past fifty years thousands have availed themselves of these privileges.

The action is significant, however, and especially welcome, because it shows that the legislative branch of the Government is disposed to encourage in every way the use of the collections in Washington, already vast in extent, for the one purpose for which, above all others, they are adapted.

The resolution is printed below in full:

Whereas large collections illustrative of the various arts and sciences and facilitating literary and scientific research have been accumulated by the action of Congress through a series of years at the National Capital; and

Whereas it was the original purpose of the Government thereby to promote research and the diffusion of knowledge, and is now the settled policy and present practice of those charged with the care of these collections specially to encourage students who devote their time to the investigation and study of any branch of knowledge by allowing to them all proper use thereof; and

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Whereas it is represented that the enumeration of these facilities and the formal statement of this policy will encourage the establishment and endowment of institutions of learning at the seat of Government, and promote the work of education by attracting students to avail themselves of the advantages aforesaid under the direction of competent instructors: Therefore,

*Resolved by the Senate and House of Representatives of the United States of America in Congress assembled,* That the facilities for research and illustration in the following and any other Governmental collections now existing or hereafter to be established in the city of Washington for the promotion of knowledge shall be accessible, under such rules and restrictions as the officers in charge of each collection may prescribe, subject to such authority as is now or may hereafter be permitted by law, to the scientific investigators and to students of any institution of higher education now incorporated or hereafter to be incorporated under the laws of Congress or of the District of Columbia, to wit:

- One. Of the Library of Congress.
- Two. Of the National Museum.
- Three. Of the Patent Office.
- Four. Of the Bureau of Education.
- Five. Of the Bureau of Ethnology.
- Six. Of the Army Medical Museum.
- Seven. Of the Department of Agriculture.
- Eight. Of the Fish Commission.
- Nine. Of the Botanic Gardens.
- Ten. Of the Coast and Geodetic Survey.
- Eleven. Of the Geological Survey.
- Twelve. Of the Naval Observatory.

Approved, April 12, 1892.

#### VISITORS.

The number of visitors to the Museum building during the year ending June 30, 1893, was 319,930, an increase of 50,105 over the preceding year; and to the Smithsonian building, 174,188, an increase of 59,371 over the preceding year.

The monthly register of visitors during the fiscal year ending June 30, 1893, is as follows:

Year and month.	National Museum building.	Smithsonian building.
1892		
July .....	21,846	10,132
August .....	18,776	8,704
September .....	122,484	75,392
October .....	28,434	9,194
November .....	12,139	5,229
December .....	14,992	7,284
1893.		
January .....	10,819	5,291
February .....	12,656	5,869
March .....	36,760	25,544
April .....	12,778	7,415
May .....	16,662	7,976
June .....	11,584	6,094
Total .....	319,930	174,188
Approximate daily average on a basis of 313 days in the year .....	1,022	556



*Number of visitors to the Museum and Smithsonian buildings since the opening of the former in 1851.*

Year.	Museum building.	Smithsonian building.	Total number 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-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
1888-'89 .....	374,843	149,618	524,461
1889-'90 .....	274,324	120,894	395,218
1890-'91 .....	286,426	111,669	398,095
1891-'92 .....	269,825	114,817	384,642
1892-'93 .....	319,930	174,188	494,118
Total .....	2,988,130	1,370,686	4,358,816

#### QUESTIONS OF CORRESPONDENTS AND REQUESTS FOR IDENTIFICATION.

In an editorial in the London "Athenæum" not long ago, it was said that there is not a department of the British Government to which a citizen has a right to apply for information upon a scientific question. This seems hard to believe, for I can not think of any scientific subject regarding which a letter, if addressed to the scientific bureaus in Washington, would not receive a full and practical reply. It is estimated that not less than 20,000 such letters are received each year. The Smithsonian Institution and National Museum alone receive about 6,000, and the proportion of these from the new States and Territories, which have not yet developed institutions of learning of their own, is the largest. An intelligent question from a farmer on the frontier receives as much attention as a communication from a royal academy of sciences, and often takes more time for the preparation of the reply.

A large number of specimens are sent to the Museum each year by correspondents in different parts of the country for examination and report. Although very little benefit to the Museum is derived from the labor thus performed, it has always been the policy of the Museum to assist its correspondents in this direction as far as practicable. By far the larger portion of the material received is geological. Quantitative analyses, however, can not be undertaken, owing to lack of facilities for such work. A record is kept of each package received for examination, and should the specimens prove to be of sufficient interest or value, they are added to the collections of the Museum and given an accession number.

There were received for examination during the present year 516 lots of specimens, embracing Nos. 1775 to 2290, inclusive. A detailed

list of the material so received, arranged alphabetically by name of sender, is given in Appendix v.

#### MEETINGS OF ASSOCIATIONS IN WASHINGTON DURING THE YEAR.

Washington has during recent years been selected as the place for holding meetings of a large number of national and international societies of all kinds. Each year has seen an increase in this respect, and the matter has now become of such importance (not so much, however, on account of the number as of the character of the societies) that it seems proper to make mention of it in a report which is intended to contain in a general way a reference to all efforts to develop and encourage research, both from a scientific, economic, and a literary point of view. There is probably no place in the country better suited for such meetings. The seat of government and center of political activity has become accustomed to receiving and entertaining organizations.

Of late years numerous learned bodies have met in various halls in this city. The many attractions of the capital, the opportunity of easy access to public record offices and the Congressional Library, the general interest of the Government buildings, combine to make Washington a favored city for such purpose. During the last year these conventions were fewer than usual owing to the concentration of so many interests in Chicago during the World's Fair.

The meeting of the American Ornithologists' Union continued in session for three days (from November 15 to 17), and during that time a large number of interesting papers were presented.\*

As in previous years, the annual meeting of the National Academy of Sciences was held in the lecture hall of the Museum, the session lasting four days, from April 18 to 21.†

The course of Saturday Lectures, which was discontinued two or three years ago, was resumed in March, 1893, under the auspices of the Anthropological Society of Washington. The course consisted of a series of lectures, somewhat popular in their character, on various subjects relating to ethnology. The lecturers were all men well known in their chosen fields of investigation.‡

\* In Appendix viii the titles of these papers are given.

† A list of the papers read before the Academy appears in Appendix viii.

‡ A list of the lectures comprising this course will be found in Appendix viii.

The following table indicates the number and dates of Saturday lectures since 1882:

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
1889.....	March 9, May 11.....	10
1890.....	February 1, April 3.....	10
1891.....	.....	.....
1892.....	.....	.....
1893.....	March 25, May 13.....	8
Total .....	.....	111

#### NECROLOGY.

Dr. George Vasey, botanist of the Department of Agriculture and honorary curator of the Department of Botany in the U. S. National Museum, died on March 4, 1893. Dr. Vasey was born on February 28, 1822, at Scarborough, Yorkshire, England. He graduated from Berkshire Medical College, at Pittsfield, Mass., in 1848; was appointed botanist of the Department of Agriculture in April, 1872. He also held the position of honorary curator of botany in the U. S. National Museum. His principal work has been upon grasses, and among other papers he published a Descriptive Catalogue of Native Forest Trees of the United States, 1876; Grasses of the United States: a Synopsis of the Tribes with Descriptions of the Genera, 1883; Agricultural Grasses of the United States, 1884; Descriptive Catalogue of the Grasses of the United States, 1885; Report of Investigations of Grasses of the Arid Regions, two parts, 1886-'87; Grasses of the South, 1887; Agricultural Grasses and Forage Plants of the United States, a revised edition, with 114 plates of agricultural grasses, 1889; Illustrations of North American Grasses: Vol. I, Grasses of the Southwest, 100 plates with descriptions, 1891; Vol. II, Part I of the same, Grasses of the Pacific Slope and Alaska, 1892; Monograph of the Grasses of the United States and British America (Vol. III, No. 1, Contributions from U. S. National Herbarium), 1892. Dr. Vasey was a member of the Biological and Geographical Societies of Washington, and a Fellow of the American Association for the Advancement of Science. He was appointed delegate from the Department of Agriculture and the Smithsonian Institution to the Botanical Congress in Genoa in September, 1893.

At a meeting of the officers of the U. S. National Museum held on March 6, 1893, the following minute and resolution were adopted:

In the death of Dr. George Vasey the National Museum has lost a faithful and efficient officer and the science of botany an able and indefatigable worker. As bota-

nist of the Department of Agriculture and curator of the National Herbarium for twenty-one years, Dr. Vasey's name has become known to all botanists throughout the world, and his contributions to science form an indispensable part of the working library of every botanist. His familiarity with the flora of all parts of the United States, especially with the plants of the great West, was unrivaled, and caused his opinion to be sought and respected upon all critical questions relating thereto. He was the recognized authority on this side of the Atlantic in the important department of grasses, and his publications relating to these have great economic as well as scientific value.

Dr. Vasey was uniformly gentle and kind, manifesting a warm interest in the progress of younger botanists and beginners, always ready to give his valuable time and counsels to those who went to him for assistance, and many who are now well known in the science owe their success in large part to the encouragement and stimulation received from him. In this way the circle of his influence was much wider than would be naturally inferred from his quiet life and long confinement to a single post of duty.

To the world at large Dr. Vasey was distinguished for his modest and unobtrusive character, his kindly disposition, and his genial manners. A model husband and father, an estimable neighbor, and a good citizen, his loss will be deeply felt by all who knew him: Therefore,

*Resolved*, That the sympathies of the officers of the National Museum and Smithsonian Institution be extended to the widow and family of the deceased, and that a copy of this minute and resolution be transmitted to them.

Capt. John Melmoth Dow, who for many years, as agent of the Pacific Mail Steamship Company at Panama, was a warm and valued friend of the National Museum, died in New York City on November 4, 1892. Capt. Dow was an Honorary Fellow of the Zoological Society of London, a member of the New York Geographical Society, of the Academy of Natural Sciences of Philadelphia, of the Society of California Pioneers, and of the Société Humanitaire et Scientifique du Sud-Ouest de la France.

Lieut. T. Dix Bolles, U. S. Navy, who for many years has cooperated with the National Museum, particularly in matters relating to ethnology, and from whom valuable contributions to the collections have been received, died during the year.

#### COLUMBIAN HISTORICAL EXPOSITION IN MADRID.

In accordance with an act of Congress approved May 13, 1892,\* the President appointed a commission to represent the United States at the Commemoration of the Fourth Centenary of the Discovery of America, which took place in Spain in the latter part of 1893.

This commission consisted of Rear-Admiral S. B. Luce, U. S. Navy; James C. Welling, LL.D., chairman of the executive committee of the Smithsonian Institution, and the Assistant Secretary of the Institution.

The Spanish Government had, in pursuance of the royal decree of January 9, 1891, provided for a series of international celebrations, most prominent among which were two historical expositions to be held in

\* See Appendix x.

Madrid simultaneously and in adjacent buildings—one the Exposicion Historico-Americana, the other the Exposicion Historico-Europea.\* This idea of two expositions, held simultaneously in the same building, and each illustrative of the other, was a novel one, and proved in the end a success. The plan is discussed in the report of his excellency Don Antonio Cánovas del Castillo to the Queen Regent, and the classification of the two expositions indicates fully the intention of the exposition authorities.\*

The Historic American Exposition was intended to illustrate the civilization of the New Continent in the Pre-Columbian, Columbian, and Post-Columbian periods, while in the Historic-European Exposition were shown the civilization of Europe, and particularly of the Iberian Peninsula, at the time when the New World was discovered and colonized. It was intended that, by the aid of these exhibitions, students and visitors might be enabled to understand the state of artistic and industrial civilization in Europe and America in this important epoch, and to realize the influence which the one may have exercised upon the other.

The period which the authorities in charge of the Historic-European Exposition desired especially to illustrate was that during which American history was most closely identified with that of Europe. This extends from 1492, when the Spanish caravels first reached the Antilles, to 1620, when the *Mayflower*, setting forth from a Dutch seaport, brought the English Puritans to New England.

“The Columbian epoch,” extending from the end of the fifteenth century through the first third of the seventeenth, includes most of the principal initial efforts for the exploration and colonization of the new continent by Europeans. By bringing together, in a retrospective exhibition, what remains to illustrate the arts and industries of Europe at this time, it was the desire of the Spanish authorities “to teach the people of to-day what were the elements of civilization with which, on the side of the arts, Europe was then equipped for the task of educating a daughter, courageous and untamed, but beautiful and vigorous, who had risen from the bosom of the seas, and who, in the course of a very few centuries, was to be transformed from a daughter into a sister—a sister proud in aspiration and mighty in power.”

The exhibits in this Historic-American Exposition were divided into three great series: One to include American prehistoric remains, the first indication of the existence of man in caves, neolithic monuments, lacustrine dwellings, and the arms and utensils of this primitive age; the second to illustrate the characteristics of the American aborigines just prior to the discovery, and the third, the period of discovery, of conquest, and of European influence, up to the middle of the seventeenth century.

It was arranged to have also a special group of objects illustrating

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\* See Appendix X.

the voyages of Columbus and his companions, as well as previous efforts for the discovery of a new continent.

The expositions were held in the new building erected for the national library and museums in the Paseo de Recoletos, and in the adjacent grounds and buildings of the Parque de Madrid.

There were other celebrations in connection with the expositions, beginning with a congress at Huelva, on the 2d of August, in commemoration of the four hundredth anniversary of the departure of the vessels of Columbus from the port of Palos, followed by a session of the Congress of Orientalists, which took place in the Alcazar in Seville, continuing from the 1st to the 6th of October; and the Ninth Congress of Americanists, in the Convent of La Rábida, at Huelva, from the 7th to the 11th of October. On the 11th of October was unveiled at La Rábida a monument to commemorate the discovery of America. There were other festivals and naval demonstrations at Huelva at various times from the 3d of August to the 3d of November.

The management of the commemoration was vested in a royal commission, the president of which is the prime minister of Spain, his excellency Don Antonio Cánovas del Castillo. Commissions were organized in all of the Spanish-American republics, by which very extensive exhibits were secured, and special commissions were also appointed by the governors of the Spanish provinces and the governors-general of the Antilles and the Phillipine Islands.

Our commissioners, by a circular issued June 1, 1892, invited the cooperation of persons having objects of any kind suitable for exhibition on this occasion, requesting them to be sent to the Smithsonian Institution for transmission to Madrid. Objects intended for the World's Columbian Exposition in Chicago were, by a special arrangement, to be forwarded direct from Madrid to Chicago in ample time for installation.

It was especially urged that authors and publishers of books relating to the periods of discovery and conquest, and the colonial history of the several European settlements in America, should exhibit them.

The executive work was, by agreement between the three commissioners, divided as follows: The commissioner-general to reside in Madrid through the exhibition, and in addition to his ceremonial functions to direct the return of the exhibits; Dr. Welling was to prepare a general report upon the exhibition, and the writer to have charge of the preparation of the exhibits, their transportation to Madrid, and their installation in the exposition building.

In connection with this work, representatives of the two anthropological departments of the Museum were detailed to accompany the exhibits of the Museum to Madrid, and to assist in the installation and maintenance of the display. These were Dr. Thomas Wilson, curator of prehistoric anthropology, and Dr. Walter Hough, assistant curator of ethnology, who was sent to represent Prof. Mason, the curator, the latter, on account of the preparations in progress for the Chicago Expo-

sition, in which his department was so extensively concerned, being unable to leave Washington.

The Department of State and the Bureau of American Republics sent the extensive collection of portraits of Columbus, and of monuments and historic localities connected with the discovery of America, which had been prepared by Mr. William Eleroy Curtis, Chief of the Bureau; and Mr. Curtis, in person, superintended the installation of this exhibit while serving as special envoy of the Government to invite the attendance of a representative of the royal family and the Duke of Veragua, Columbus' lineal descendant and representative, to attend the World's Columbian Exposition.

Mr. Stewart Culin, curator of the museum of archaeology and paleontology of the University of Pennsylvania, was detailed by the university to represent the institution upon that occasion, and to install a large collection of archaeological objects from its museum.

Mr. J. Walter Fewkes, director of the Hemenway Expedition, by which an extensive display of ethnological objects from the Southwest was exhibited, also accompanied the commissioner to Madrid and remained during the entire period, in company with his assistant, Mr. J. S. Owen.

Mr. Stewart Culin was appointed secretary of the commission; Lieut. J. C. Colwell, U. S. Navy, was detailed by the Navy Department as disbursing officer, and Mr. Henry Horan, of the National Museum, was sent to attend to the unpacking and the mechanical work of mounting the exhibits in Madrid.

The writer sailed for Southampton August 4, accompanied by Dr. Hough and Mr. Culin, and arrived in Madrid August 19, remaining until the exhibits had arrived and the work of installation well begun. In the meantime, the opening of the exhibition having been deferred until October 30 and his share of the work having been practically accomplished, except what could be done even more satisfactorily by other officers of the Museum already in Madrid, he left Madrid for Washington September 17. Dr. Wilson was recalled, by reason of family troubles, November 3. Dr. Hough remained until the close of the exhibition, February 4, and superintended the packing and return of the exhibits, the last of which reached Washington in April, in time, as had been anticipated, for use in Chicago.

It should be said that a large part of the exhibits sent from the National Museum to Madrid were selected from those already mounted for display at the World's Fair, and that cases were sent from Washington for the accommodation of all the exhibits sent from the United States, which occupied a floor space of 16,000 square feet. It was found, however, that the Spanish Government had provided a certain number of cases admirably suited for exhibition—an entirely unprecedented act of forethought and liberality in exhibition management—and it was consequently found unnecessary to unpack all the cases which had been provided.

Dr. Welling, who had proceeded as far as London, was called home by business connected with his university and was unable to return. He therefore resigned, and Prof. D. G. Brinton, of the University of Pennsylvania, was appointed to serve in his stead. Dr. Brinton, accompanied by his assistant, Mr. H. C. Mercer, arrived in Madrid December 1 and spent several weeks in studying the collections in both expositions and writing his report.

Mrs. Zelia Nuttall, well known for her remarkable studies in Mexican archaeology, was present for a considerable time at the exhibition, and made an exhibit in the section of the United States.

The exhibit of the United States was received with great favor, and the friendly action of our Government in sending so extensive and impressive an exhibit was greatly appreciated. Among the results to which it led were the acceptance of the invitations of the Government to the royal family and to the Duke of Veragua, the liberal response of the Spanish Government to the invitation to participate as an exhibitor in the World's Fair, and, incidentally, the increased interest on the part of the Latin-American Republics, many of which confessedly did far more at Chicago, inspired by the example of the Government of Spain, than they would otherwise have done; and, incidentally, may it be also noted, the speedy completion of an important commercial treaty between the United States and Spain, which had long been pending, and which, until the action of Congress in connection with the Madrid Exposition was known, seemed scarcely likely to be agreed to by Spain.

The exposition was undoubtedly a most successful one, and in many respects one of the most noteworthy international expositions ever held, although from its very nature it appealed more to the scholar than to the general public, and consequently, so far as popular attendance and financial outcome were concerned, was not noteworthy. The various governments which participated were represented by men of character and high scholarship, and the catalogues published by Spain and by the several governments were important contributions to history and archaeology, and several valuable reports have already been printed by governments and specialists. Others are in preparation, and the effects of the comparative display made will appear in historical and archaeological literature for a long time to come. A most noteworthy indirect result was the publication of a considerable number of important historical monographs and collections of documents hitherto unpublished, which appeared in Madrid during the period of the exposition.

The Ninth Congress of Americanists, held at Huelva, was one of the most successful which has been held, and American scholars participated prominently in the discussions. The report of this congress, when published will contain much that is of importance to archaeology.

The customary system of medals and diplomas prevailed at the expo-



sition. A grand diploma of honor was given to the Government of the United States. Twelve gold medals with diplomas, eighteen silver medals with diplomas, thirteen bronze medals with diplomas, were awarded, while thirty-six exhibitors received honorable mention. A list of the medals and diplomas is given in the Appendix,\* which contains also a list of exhibitors.

It should be said in this connection that with the exception of the exhibits sent by the Bureau of American Republics, the University of Pennsylvania, and the Hemenway expedition these mentioned in this list were all sent at the request of the Smithsonian Institution, and were mounted, labeled, and exhibited as a part of its display. Indeed, as was recognized by the Government, but for the enthusiastic cooperation afforded by the Smithsonian Institution it would have been impossible in the short time between the passage of the appropriation and the opening of the exposition, to have prepared and forwarded an exhibit which would have been at all creditable to the United States.

Incidentally may be mentioned the award by the Queen Regent of the grand cross of naval merit to Admiral Luce, and that of commander in the Royal Order of Ysabel la Católica to Mr. W. E. Curtis, Dr. Thomas Wilson, and the writer; and that of knight in the same order to Messrs. Hough, Fewkes, and Culin, while the latter was also honored by election to membership in the Royal Academy of History.

At the close of the exposition Admiral Luce, who remains in Europe, dissolved his official connection with the commission, and the closing up of the business of the commission is left in the hands of the writer as Acting Commissioner-General, with the assistance of Dr. Hough as executive officer, while the other commissioner, Dr. Brinton, is engaged upon the preparation of the general report, which will be published during the coming year, supplemented by a catalogue of the objects displayed by the Museum, by Messrs. Wilson and Hough, and papers by Mrs. Zelia Nuttall, upon "Ancient Mexican Feather Work;" by Dr. Hough, on "Ancient American Pottery as shown at the Exposition," and Mr. H. C. Mereer, on the "Chipped Stone Implements shown at the Exposition."

In view of the great interest in this exposition, and of the fact that the publication of the official report may be somewhat delayed, I include here a discussion of the exposition in its general aspects from the pen of Dr. Walter Hough.†

The display which was brought together in Madrid was the greatest collection of Americana ever under one roof, and brought into contrast, side by side the art of the Old World at the time of the discovery and that of the New World, roughly on either side of the discovery.

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\*Appendix, No. X.

† A description of the Exposition in some of its features was printed by Dr. Thomas Wilson in the "American Naturalist" for September and October, 1893.

Joined with its admirable historical and scientific motive, there was great taste displayed in the presentation of the valuable material. No doubt a similar opportunity to compare the ethnological and archaeological products from so many American sources will be far in the future.

The American exhibits dealt mainly with the archaeological aspect, except that of the United States, which was a comprehensive collection, setting forth in plain terms the interdependence of archaeology and ethnology. The twenty-four States and countries in large proportion displayed ethnological specimens only for decoration or in an unsystematic way. There were about 250,000 pieces on view, of which the United States, Mexico, and Spain showed the larger number. The floor-space measured 5,000 square meters; of this space the United States and Mexico occupied about one-third.

The United States section occupied six rooms, embracing a long list of exhibitors, both institutions and private persons. The National Museum furnished a portion of the large ethnological and archaeological collections destined for Chicago, selected by Profs. Mason and Wilson. It furnished also specimens of the animals encountered by the early explorers, maps, pictures, photographs, transparencies, illustrations from books on American ethnology, publications of the Smithsonian Institution, enlargements, maps, paper money, medals, etc. There was also a library of historical works, and a collection of writings on American archaeology and ethnology presented by the authors.

The Bureau of Ethnology contributed models of Indian pueblos, the great linguistic maps, pottery, photographs, pictures, and four cases containing a fine series from seven pre-Columbian mines and quarries explored by Mr. W. H. Holmes. These especially attracted a great deal of attention, as did the splendid series of relief maps exhibited by Mr. E. E. Howell.

Philadelphia was well represented in the exhibition. The University of Pennsylvania displayed publications and monographic archaeological collections from Pennsylvania, Ohio, North Carolina, and Florida. The enterprise of the Numismatic and Antiquarian Society and the Academy of Natural Sciences, of Philadelphia, is very commendable. The former showed a large collection of medals, paper money, and publications. The Academy of Natural Sciences exhibited 44 crania from the Morton collection, representing 35 tribes and 14 American stocks. The Philadelphia collections were in the efficient charge of Mr. Stewart Culin.

The Bureau of Latin American Republics showed a magnificent gallery of Iconographia Columbiana, supplemented by Mr. Curtis's own collection. These pictures formed a well-arranged and attractive feature of the exhibition.

One large hall was devoted to the Tusayan pueblos and was filled with the collections made by Dr. Fewkes, under the munificent patronage of Mrs. Hemenway, and presented especially the religion and symbolism of the Hopi. Sand pictures and altars were shown for the first time. The ancient pottery was exceptionally fine, and there was a large series of religious paraphernalia. Photographs, water-color drawings, maps, and publications completed an exhibit for which Dr. Fewkes is to be highly congratulated.

Mexico brought a magnificent collection of antiquities, chiefly pottery and stone filling over 50 cases. There were casts of famous antiquities, copies of the codices, pictures, models, and photographs of the ancient ruins, and notably a grand model of the Temple Mayor of Cempoala (Vera Cruz), measuring 12 by 18 feet in area. A fine central case held the gems of the collection, such as obsidian masks, vases, labrets, mirrors, tiles, a carved notched femur (which is probably part of a musical instrument like those used in New Mexico and Arizona), copper rings, jade objects, etc. The series of obsidian rings of hour-glass shape, with wide, flat rims, worked down to a thickness of one-sixteenth of an inch and highly polished, are very remarkable specimens of lapidary work. They would tax Mr. McGuire's skill and ingenuity in stone-working. Many such problems confront one at every step in

this vast and practically unworked material. One room with 14 cases is devoted to the Zapotecs. In the whole collection the relics of 23 ancient civilizations were shown. Mr. Troncoso, director of the National Museum of Mexico, is a host in himself and has an efficient staff of collaborators.

There were a number of small collections from Cuba, San Domingo, the latter consisting of human remains, weapons, idols, pottery, etc., of the aborigines, and historical relics of the age of the discovery, and from Bolivia, Argentine Republic, Brazil, Chile, Honduras, Salvador, and Paraguay.

The bulk of the numbers from Guatemala were of pottery. There were many finely carved stone images, an oval dish of polished quartz of bluish tint, and an exquisitely carved bead of jade. There was also a curious globular pottery whistle or flute, somewhat like an ocarina, with four holes, giving five tones, running from C to F sharp, and a pottery trumpet, with four pipes blown from one mouthpiece. I do not know who is to be held responsible for the exhibition of an Egyptian scarab and a bronze *shubti* as American relics. This collection contains three rare and beautiful vases ornamented with Quiche Maya hieroglyphics. Dr. Brinton believes that these are the only Quiche Maya inscriptions yet discovered.

Nicaragua displayed a small collection of pottery in red outlined with black, stone implements, rude and polished, and a few pieces of jade and gold work.

Costa Rica occupied two halls with a fine collection, mostly of pottery and stone carvings, contained in 40 cases. The walls were covered with paintings of the excavations, maps, and photographs. This collection was shown at Chicago. The interesting gold objects exhibited by Mr. Alfaro in Washington in 1891 were displayed in one case, and two other cases held jade carvings. The pottery resembles that of Nicaragua, and consists of burial jars, cups, vases, spoons, cooking pots, etc. The stone carvings are particularly good; they are principally of friable, volcanic rock. The ornamented metates, skillfully worked stools with their seats upheld by human figures; the magnificent sacrificial stone, 6 feet long and 25 inches wide, finely sculptured at the head and along the margins and edges, are especially noteworthy, while the series of stone masks, standing and sitting figures, animal and human heads, give an enlarged idea of the progress of the sculptor's art in ancient Costa Rica.

Seventy-two pounds of wrought-gold objects, 452 in number, and 383 objects of copper, invested Colombia's room with a peculiar interest. These consisted of bowls, canteens with full-length human figures, necklaces, animal and human forms, etc. There also was much pottery of a superior order from the Quimbayas, Chibchis, Chiriquis, the Department of Tolma and Antigna; a fine series of photographs was also displayed. There was a small ethnological collection from the Cunas and Guahibos. This collection was well installed and catalogued by Mr. Ernest Restrepo, and was a great credit to the Republic of Colombia.

Of the 11 cases from Ecuador 10 were of the lustrous, dark, and usually indurated pottery, which is very interesting from its curious forms, among which occur long, narrow, amphora-like jars with lugs, tazzas sitting on a high, perforated foot, exactly counterfeiting Korean mortuary pottery, and square jars of Chinese form, giving this collection a strange phase. There was one case of copper axes, bored stone axes, star club heads, labrets, and charms of worked stone. It is rather remarkable if articles which are evidently separators for pottery are found in ancient excavations in Ecuador.

Peru exhibited a large number of pottery bottles of red and black ware in human and animal forms from the Incas of the Yucas. Four of these are in the form of human heads, in which the nose is represented as having been eaten away, evidently by some disease which a Spanish physician diagnoses as lupus. Dr. Brinton expresses the opinion that the disease characterized is syphilis. The Yunca pottery also shows trace of Spanish influence. There were some good specimens of gold working, textiles and wood carving.

Uruguay sent a small but well-displayed collection of stone implements, comprising bolas, club heads, arrowheads, scrapers, hammer stones, mortars, stone and pottery vessels, bone awls, pitted stones, and many polishers and grinders. There were a number of probable club heads, square to oblong in shape, roughly broken from schistose rock, which slightly resemble the obsidian heads from Easter Island in the Thomson collection at the National Museum. The greater part of these remarkably rude objects have four cusps, and are constricted midway apparently for purposes of hafting. Some of the pebbles with one smooth central pit are apparently head pieces of a drill. A good series of photographs of stone implements accompany this collection. These specimens are interesting, since they are from a new field.

Spain showed the treasures of the Archeological Museum and the Museum of Natural Sciences, which are especially rich in Peruvian and Mexican archeology. From the former country there were numerous mummies, hafted stone implements, and other objects taken from graves, cult apparatus, stone and metal work, splendid textiles and feather work, musical instruments, and an immense series of pottery, in which are many groups of pieces evidently from the same mold. The exquisite Peruvian coat from the Royal Museum was a marvel, which for fineness of fabric, color, ornamentation, and finish it is difficult to believe has ever been surpassed. There were also many other examples of fine Peruvian textiles.

The famous Troano and Cortesian codices were displayed, and also a great deal of stone and metal work, pottery, etc., from Mexico. One case of pottery and some stone idols, labeled "frauds," were very suggestive. There were also small groups of specimens from South and Central America, and ethnologica from various states. The Alaskan and other Indian specimens were in few cases localized, the objects having been collected before such information was deemed necessary. The museums labor under this difficulty, and there is a good field for comparative work. The Northwest coast masks, hats, adzes, carvings, armor, etc., were collected more than one hundred years ago by the Malespina expedition and range from British Columbia to Sitka. A collection of arrowheads, sent by Dr. W. J. Hoffman, occupied a prominent place. The museum of Natural Sciences had on exhibition a large collection of minerals and botanical specimens brought back from America by Spanish explorers. The museums have been benefited by the infusion of new blood; Mr. Narciso Sentenach and José Ramón Mérida are young men, who promise to do excellent work.

The Portuguese exhibit contained a few American specimens used for decoration, with other objects from different quarters of the globe, forming what was apparently a fisheries exhibit. There were splendid paintings and metal work of the fourteenth and fifteenth centuries, which should have been installed in the European exposition upstairs. Two rare Sandwich Island feather cloaks and some helmets were shown. The locality of few specimens was known.

Austria contributed an excellent exhibit of mound pottery and other objects from the United States. This collection was under the care of Dr. Wilhelm Hein, of Vienna, who is an enthusiastic worker in the field of ethnology.

Germany sent casts of the sculptures of Santa Lucia Cozumalualpa, in Guatemala, consisting of large bas-reliefs, monkeys' heads, human figures, and a large brazier in the Ethnographical Museum of Berlin. Two antique Mexican feather shields from Stuttgart, and a great number of illustrations and photographs were displayed. The gold objects from Colombia in this collection were in an elegant burglar and fire-proof case, so fitted that the tablets upon which the specimens were mounted could be lowered into a steel vault and secured for the night. Dr. Edward Seler, of the Royal Ethnographical Museum of Berlin, was in charge, and most of the specimens were collected by him.

Sweden showed the fine collection of early maps, globes, and manuscripts of Baron Nordenskjöld, the collections from the Chukchis and the Eskimo of Port Clarence,

procured on the voyage of the *Vega*, the photographs, models, and specimens resulting from the explorations of Gustav Nordenskijöld in Colorado two years ago, and the objects brought from Nicaragua and Costa Rica by Dr. Carlos Bovallius. These gentlemen were in charge and arranged a very creditable display.

Norway exhibited a full-sized model of a viking boat. The original was taken from a tumulus on the east coast of Norway in 1880.

The display of Denmark was composed of two parts, viz, one illustrating the life of the Eskimo of Greenland, the other the grade of civilization of Iceland in the middle ages. The collection was well presented, and showed in a small way the Eskimo man and woman, their houses and utensils, methods of transportation, and some of their arts. The wood carvings, textiles, and model of the house of the Icelanders were very interesting.

The documents under the efficient charge of Dr. Zaragoza were of the highest interest, and included priceless letters of Columbus and other discoverers and conquerors, with manuscripts of the early explorers and priests.

The exposition was visited by many of the Americanists after the meeting at Huelva, among whom may be mentioned Dr. Hany, Baron de Baye, M. Adam, Charles Read, and others. The orator, Castelar, was a close student of the collections, and the intelligent interest displayed by many scientific men at the Spanish capital was very gratifying.

On the whole, the exhibition was not well attended, as its patronage was largely drawn from Madrid and the immediate vicinity, there being also little advertising and no excursion rates offered by the railroads. This, however, does not detract from the commendation which should be given to the Spanish Government for the enlightened idea and the consummate ability with which this idea was carried out by the delegate general, Señor Don Juan Navarro Reverter, Rev. Padre Fita, and their colleagues.

When it comes to describe the sister exhibition, setting forth the state of European culture at the era of the discovery, there is a great difficulty in merely indicating the priceless rarities displayed. No one imagined that after the many spoliations which the Iberian Peninsula has suffered, so many art works survived.

When inquiry was made for the relics demonstrating the splendor of Old Spain, the church alone could respond with the evidences of her traditional fostering and conservation of art.

Thus it happens that the exhibit largely comprised ecclesiastical objects from the more important churches of Spain. Without doubt not above one-fifth of the precious relics existing among the churches and religious institutions were represented in Madrid, due to the poor communications in Spain and no general antiquarian interest among the people.

There is a saying that "tapestries are like weeds in Spain." Mr. Charles H. Read, of the British Museum, from whose admirable description of the exposition I shall more than once quote, says:

"The most striking feature of this part of the exhibition, and that which distinguishes it from any other, is the extraordinary display of Flemish and Spanish tapestries and carpets and Persian and Arab textiles with which the walls of every room on the upper floor are lined. Most of the Flemish tapestries from the Escorial and the other royal palaces are already well known, both from their being generally shown to visitors and from the excellent photographs published by M. Laurent, of Madrid. But in addition to these, many from private collections and from religious establishments, some of them fully as important as those of the royal collections, have come to light and are now seen for the first time. The most striking case of this kind is probably that of the Cathedral of Zamora. The authorities

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\* READ, C. H., Report to the British Museum on the Historical Exhibition at Madrid. London, 1893.

at Zamora were asked to contribute to the exhibition some of their works of art, and sent among other things several beautiful tapestries of the fifteenth century, of great size, of fine design, and in a good state of preservation. With this consignment came a statement that if more tapestries were required for the decoration of the walls, the chapter possessed fifty others. It seems impossible that so wonderful a series of precious tapestries could have lain entirely unknown for centuries, and doubtless unseen except by such as attended the services at the cathedral on certain special festivals. Such a case, and it seems to be by no means an isolated one, illustrates in a forcible manner the unknown riches of the religious establishments of Spain, unknown even to the comparatively few persons in the country who are specially interested in such matters.\*

The display of church vestments was very large, but the majority were overloaded with embroidery in gold and silver and belong to the sixteenth and seventeenth centuries. The older vestments are invariably of higher quality. One of these is described by Mr. Read:

"First of these comes a cope of opus anglicanum of the end of the thirteenth century, belonging to the Cathedral of Toledo, and stated to have been the property of Cardinal Gil de Albornoz (1367). It is of the usual semicircular shape, embroidered in many colors with sacred subjects and figures of saints under canopies. Along the straight side are six figures of bishops, a king and queen, and the rest of the surface is entirely covered with a radiating design, the central subjects being the Coronation and Assumption of the Virgin, the Nativity, the Annunciation, and the Virgin and Child, and on either side of the outer edge figures of the following saints: John the Evangelist, Edward the Confessor, Laurence, Mary Magdalen, Ethelbert, Dunstan, Margaret, Catherine, Thomas of Canterbury, Olave, Stephen, Helen, Dionysius, Edmund the King, John the Baptist, and a bishop without name. The inner circle is composed of eight figures of apostles: Saints Paul, Simon, Philip, James, Andrew, Thomas, Bartholomew, and Peter. The names are inscribed upon scrolls in Lombardic capitals. In the spandrels are placed birds, executed in brilliant colors. It will be seen that certain of the saints are especially English, and thus help to confirm the cardinal's description of his own cope, as well as the internal evidence of the design and method of work, both of which point to the conclusion that the cope is of English work. In addition to this, however, I am able to add by the kind offices of Senor Canovas del Castillo, through Don G. J. de Osma, the following extract from the will of the original owner: 'Item lego eidem ecclesie Conchensi caput argenteum cum reliquiis beati Blasii ponderis quadraginti octo marchorum. Item pluviale meum pretiosum de opere anglicano. Volo tamen quod dicti decanus et capitulum nunquam possint illa alienare, vendere, sen' impignorare, etc.'"

The Cathedral of Mondoñedo sent the sandals of Don Pelayo II, of Cedeira (1199-1218). The shoes or sandals reach to the ankles, made of stuff originally purple, with bands of gold thread across the instep and down the middle of the foot to the toe. The soles are nearly 2 inches thick, somewhat like a Chinese shoe, and the edges are ornamented with stiff interlacing floral scrolls of the style usually found in works of art at this period.

In reference to the large display of church plate, Mr. Read says:

"There can be no doubt that so rich a collection of material for the study of Spanish gold and silversmiths' work has never been before brought together. A great proportion of the objects exhibited is naturally of the late sixteenth and early seventeenth centuries, but many fine pieces of earlier and more interesting periods are to be found. The silver chalice and paten of late thirteenth or early fourteenth century from Toledo Cathedral are remarkable among these, both for the beauty of the work and for the unusually large size of both objects. The chalice is more than a foot in diameter at the base and 17 inches in height, while the paten is 16 inches

\* *Genesis de Sepulveda. Opera, Madrid, 1780.*

in diameter. The latter is sunk in the center, the depression having twelve foliations around the edge, and within it is engraved the crucifixion with the Virgin and St. John, the whole inclosed within a stiff floral border. The chalice has a plain bowl, widening rapidly upward (and in this it differs conspicuously from Spanish chalices of later date), the knob is ornamented with the evangelistic symbols in repousse, and the stem is quite plain except for two bands of quarterfoil tracery. The base is in design much like that of the Dolgelly chalice, viz, it has three concentric bands of flat lobes or scallops in slight relief, upon which are engraved figures of angels, and the edge is molded in twelve foliations supported upon a slight tracery of quarterfoils, and in each foliation is a figure of an apostle. This chalice is as early in date as any in the exhibition, and its large size renders it the most remarkable. It is stated in the catalogue that it was probably used on Holy Thursday, when two hosts are consecrated, one being reserved till Good Friday, when it is consumed by the priest. This second host is usually kept in a chalice of large size and ancient work.

"Another chalice and paten of much the same date is sent from the Cathedral of Santiago, and possesses additional interest from the decoration of the knob being in niello. The paten is of similar design to that from Toledo, but the central subject represents Our Lord seated within an engraved quarterfoil, the engraved design being all within a depression of eight foliations. The bowl of the chalice is again of the shallow form, and the stem is slender and somewhat longer than is found in English and other northern chalices. The knob has circular medallions with nielloed scrolls, but without any sacred emblems. The base is plain, with the exception of a narrow engraved border of stiff scroll work, and on one side is engraved a group of the Virgin and Child seated, with a female figure kneeling in adoration at the side. The presence of this group is the only instance in the exhibition of the practice so common in English chalices, of placing a cross or other sacred symbol upon the side of the chalice to be held next the priest during the celebration of mass. The catalogue attributes this chalice and paten to the twelfth century, but it should, I think, be placed somewhat later, i. e., in the early thirteenth century.

"Of later chalices there are a great number, dating from the early sixteenth century to the middle of the seventeenth, a period which would include by far the greatest proportion of all the church plate exhibited. It will be sufficient to notice three of the sixteenth century as being fine examples of their kind, and at the same time characteristic of the style peculiar to the period.

"The first, from the Cathedral of Seville (No. 49), is remarkable in having a cover which fits closely into the bowl and has a central socket, into which the foot of some object has been placed, perhaps a short cross. The bowl is deep and has round the base outside a row of pear-shaped settings containing knot-work medallions of cloisonné enamel, the patterns being an inheritance from the Moorish artists, and their prototypes are seen in perfection upon the sword of Boabdil, belonging to the Marques de Viane. The stem, knob, and foot are Gothic in design, the tracery being fairly pure in style; but the foot is ornamented with embossed designs of the rich, floriated style, common in Spanish and Portuguese objects of the Renaissance. This mixture of Gothic and Renaissance motives is, in fact, the remarkable characteristic of the church plate of the peninsula in the sixteenth century, and the exhibition furnishes numberless examples of it. This chalice has upon the foot the arms of an archbishop in enamel.

"The second chalice, of about the same date, from the Cathedral of Valencia (No. 50) is of a somewhat different design, and in many details recalls the drawings of cups by Holbein, though here again the border at the foot is of Gothic tracery. But for an unfortunate heaviness of the base this vessel would be of very graceful design. It is singularly secular in its details, which are chiefly composed of festoons of flowers, and fruit, and cherubs, and upon the knob tiny cupids riding dolphins. The only indications of its sacred character, apart from its shape, are six circular medal-

lions let into the foot, which are engraved with the Crucifixion and other designs of the same character. These have once been enameled, but the enamel has now entirely disappeared, owing to the vessel having been passed through the fire to freshen the metal, a practice which seems to have been common in Spain, as a large proportion of the enameled details on church ornaments of all kinds are now bare metal, owing to this somewhat barbarous practice. The third chalice, from the church of Osuna, has, perhaps, a more peculiar feature than either of the others, in having the bowl and knob surrounded with small bells, ten on the former and six on the latter. It is usually rich in detail, with the customary mixture of Gothic elements with florid Renaissance foliage. The knob is composed of rich canopy work beneath, or rather inside, which are seated figures of apostles, and upon the foot are highly-embossed scenes from the Passion. The inscription on the paten is a curious instance of the misspelling of Latin, *par domini sit scipir bobiscem*.

“Among the paxes are several deserving of mention. The Cathedral of Valencia sends the most beautiful of these. It is of fine gold, elaborately chased and enameled in brilliant colors. The front is in the form of a chair, in which is seated the infant Saviour, the whole of the figure being enameled; the back of the chair is covered with elaborate scroll work of beautiful design and filled with enamel; the lower part of the chair beneath the seat is hollow, and has two small doors which open and display a group modeled in the round, and representing the Nativity. The pediment above the back of the chair is edged with two elegant scrolls in openwork, and at the base of the pediment on each side is a figure of a warrior standing. The back is minutely engraved and enameled with sacred subjects, the Adoration of the Magi, Christ among the Doctors, etc. This specimen is by far the most remarkable of all the paxes exhibited, and its attribution to the hand of Cellini is much more reasonable than is generally the case with works assigned to the artist. A certain delicacy and refinement in the designs points rather to Italy than to Spain as the country of its origin, though whether it is really by Cellini is a far more difficult point to decide. This appears in the will (A. D. 1566) of Don Martin de Ayala, archbishop of Valencia, who bequeathed it to the cathedral.

“A pax of perhaps greater interest, and of nearly equal beauty, is that from the Cathedral of Ciudad Real. The interesting feature about this specimen is that it has for its central subject a carving in black stone of Byzantine period, representing the Descent into Hell, with the legend above, *H. Anactacic*, i. e. Resurrection, and behind the figure of Our Lord stand the emperor and empress, crowned and with halos round their heads. The frame is in the best style of the Spanish Renaissance, of silver gilt and enameled, and it bears the date 1565. On either side are square projecting stages supported on well-designed caryatid figures, and containing four figures of saints, and at the top is a frieze in relief representing a combat between horsemen and men on foot; the pediment represents the Assumption of the Virgin, with figures of Virtues at the sides, and the apex is surmounted by an enameled figure of Our Lord holding the orb. The back, though by no means so richly decorated as the front, is of great beauty. The handle is formed of a female caryatid figure with wings, surmounted by Cross of Santiago, and toward the bottom the terminal base of the figure divides into two serpent scrolls, which curve toward the edges of the pax. For beauty of line this charming figure compares favorably with any work of the period, and it would be difficult to speak in terms too high of the masterly character of the design.

“Another pax possessing unusual features is that from the Cathedral of Parazona. The central portion, if not the whole pax, is certainly of north Italian work. It is of silver gilt, and has in relief the subject of the Flagellation, a group of well-modeled figures of late fifteenth century style. The peculiarity of the work is that the flat background is painted in enamel with a mountainous landscape, in the style common in north Italy at this period, and of which there are several good examples in the British Museum collection. The inscription at the bottom of the central sub-



ject, '*Borgia Car. Mon. Regal.*' would seem to indicate that it was the property of Cardinal Borgia, archbishop of Monreale, in Sicily, who died in 1503. The frame is of uncommon design, and may be of the same work as the center, but it is possible that it was added in Spain. Two pilasters which form the sides are somewhat poor in execution, and the cresting round the curved top of the pax is curiously classical in feeling, and consists of groups of two winged lion monsters, looped together at the neck and tails, the junctions of the latter being surmounted by palmettes. There is a certain clumsiness about the design which is scarcely Italian.

"The only other pax worthy of special note is that from the Cathedral of Madrid-Alcala, an excellent example of Spanish Gothic metal work of the late fifteenth or early sixteenth century, without any trace of later style. The subject is the Descent from the Cross, modeled in high relief and enameled; this is surmounted by an elaborate canopy filled with rich tracery, and on each side are pinnacles with buttressed bases, surrounded with figures of saints. The back is good in design, the handle being a plain semicircle pierced to represent a dragon, while the edges are bordered with bold tracery in relief. The work of the whole is excellent, and little is wanting to make it a beautiful object, but a certain squatness and want of elegance of form in the design suffice to make it fall short of true beauty.

"One of the best specimens of Spanish Gothic, and a remarkable object for its great size, is the monstrance from the Cathedral of Jativa, which, without the modern silver base upon which it is now placed, stands 5 feet high. The occasion of its construction was in itself notable. Pope Alexander VI was a native of Jativa, and had this gigantic monstrance made for the Cathedral from the first consignment of silver received from America. The shape is very graceful and consists of a stem rising from a many-sided base and supporting a shaped oblong platform, the edges of which are bordered by a light arcade. Upon this platform rest four pillars which sustain the roof, and from this rise three slender towers pierced with tracery, with rich canopy work at their bases. The actual monstrance, or receptacle for the Host, is a circular disk of a size proportionate to the rest, with an elaborate openwork border of what in England would be called late Tudor style, and it is held up by two angels kneeling on opposite sides. The effect of this beautiful object is much destroyed by the whole having been regilt, and by the enamels in the foot having been renewed; but in spite of this drawback it remains one of the most beautiful, and it is the most conspicuous, objects of ecclesiastical art in the exhibition.

"The processional crosses, of which a very large number are shown, form a very interesting and instructive series, possessing many features differing from similar objects in other countries. The Marques de Cubas exhibits a good collection, which is supposed to represent all the types from the eleventh century to the seventeenth. Whether the series begins so early is perhaps doubtful, but some of the examples may well be of the twelfth, or more probably, thirteenth century. These earlier crosses are flat plates of copper, gilt, and decorated with champlevé enamels in the style of Limoges, but neither so well drawn nor so perfect in execution as the French examples, though it is by no means improbable that the Spanish enamel of this kind is an imitation of that of Limoges. The most noticeable peculiarity in design in the Spanish crosses of this period is the presence of four oval plates upon the four limbs of the cross, projecting beyond the edges of the limbs, and in each plate is a subject in enamel, but those upon the horizontal arms seem always to be the Penitent and Impenitent Thieves. The form of the cross remains practically the same up to the sixteenth century, and the four oval plates are frequently found at that date, though these two are then no longer reserved for the two thieves, but are sometimes devoted to figures of saints, the Evangelists, etc.

"A very large cross from the Diocese of Vich merits special notice. It is of silver, nearly 5 feet in total height, the surface quite plain, except for a circular disk upon each arm, in the center of which is a sixfoil with a subject in translucent enamel. This cross differs so much from all the others that it might be thought to be of for-

eign make, but the probability is that it was made in Catalonia, and perhaps near Vich itself, where the influence of French designs would be more felt than in the more southern parts of Spain. It is attributed, and, I think, rightly, to the fifteenth century.

The Spanish crosses of the sixteenth and late fifteenth centuries have a character fully as peculiar and national as those of earlier date. Those of the sixteenth century are characterized by a richness of detail that makes them look at a little distance like filigree work, but a closer examination shows that this rich effect is produced by a multiplicity of canopies, edgings, and pendants, symmetrically designed in a semi-Gothic style. The richest, and at the same time the best, in general design, of this kind is that from the Cathedral of Osuna (Seville), though many others, from Salamanca, Astorga, and other cathedrals are very good. Nearly all, however, have suffered, and their enameled details are destroyed by having been passed through the fire to render them bright."

Another class of objects are the caskets used as reliquaries. Some of them are of pure Moorish work, with Saracenic designs and inscriptions. Mr. Read describes the earliest and most important of these, a large casket of carved ivory with mounts of champlevé enamel, from the Provincial council of Valencia.

"The whole surface is carved in relief with scrolls of conventional leaves of the style common in the ornamentation of the Alhambra, the stems being interlaced. On the sides are hunting scenes; on the body of the casket are broad borders formed of pairs of birds and deer, alternating, each pair facing, and above them a series of triple arches. The cover is in the same style, but that the borders are much simpler, and in one panel a piece from another casket has been inserted. The enameled mounts are an interesting feature and form an important landmark in the history of enameling in Spain. The patterns of these are the simplest geometrical designs, and the colors blue and white; but there is every appearance of these being the original mounts, and if this be the case they must be of the middle of the eleventh century; for the great historical value of this object consists in its bearing the date of its manufacture, A. H. 441 (A. D. 1049-'50), the name of its maker, Abd-er-Rahman ibn Zeyyan, who made it at Cuenca for Hosam-ud-Daulat Abu Mohammad.

"Another casket, of nearly equal importance, comes from the Cathedral of Gerona, where it is usually placed upon the High Altar. This, though equally of Arab work, is very different in style as well as material. It is entirely covered with plates of silver gilt, embossed with open scrolls inclosing symmetrical flowers, the details of which are inlaid with niello. Around the edge of the lid, as in the previous example, is a Cutic inscription stating that it was made in Cordova by the order of Al-Hakam II, the Caliph of Spain, more celebrated for his studious habits than for warlike achievements, who died in A. D. 976. The inscription states that Al-Hakam ordered it for his son, and gives the name of the maker (Riano, p. 12). But for this inscription the style of the ornament would probably have led to the casket being assigned to a later date.

"These two caskets are without any mixture of Western motives in their decoration, and are of special interest in the history of art industries from the precision of their date and country of manufacture.

"Among the altar caskets one of the most beautiful is a cylindrical ivory box from the Cathedral of Saragossa. It is of Oriental work, the sides pierced with delicate tracery, and with bands of Arabic inscription in relief round the edge. These boxes, though by no means common, are well known, and two in the British Museum have always been thought to be of Persian origin, and it is possible that the example now in question may be also of Persian work. It has, however, an enrichment of bands of delicate filigree work, passing over and around it, which are certainly Moorish and of the late fifteenth century. This is decided by their similarity in style and work to the mounts of the sword of Boabdil belonging to the Marques de Viane. In both specimens there are Arabic inscriptions, outlined

in thin wire, running over the surface, a peculiar method that seems to have been employed only by the Moors, and about this period. At the Cathedral of Saragossa this is used to contain a cylindrical pyx, which is also exhibited. The pyx is quite plain, of silver gilt, and upon the flat cover is engraved and enameled a coat of arms surrounded by an inscription.

"A painted ivory casket, of the style usually called in England Sicilian, is shown by the Royal Academy of History. This bears upon it, many times repeated, the arms of Aragon-Sicily, and is said to have belonged to the King Don Martin, of Aragon, who died A. D. 1410. The ornamental scrolls between the shields are of unusual beauty and freedom, and a band of carved Cufic letters of an ornate character gives it an oriental aspect, which is but faintly seen in the other designs. Though the painting is not in the best state of preservation, this box is a charming specimen of the Moorish art of Sicily.

"The mudejar style, that is, the combination of Moorish or Saracenic and Christian art, is perhaps even better shown in a pair of wooden doors with gilt bronze fittings from the Cathedral of Seville. The paneling of these might be from a Cairene mosque, so purely Saracenic are their design, while their borders are composed of Biblical texts in well-carved black letter, and the bronze fittings are in accord with the ornament. The purity of the two styles is the remarkable feature of these doors, each keeping unmixed its own peculiar characteristics, and yet remaining in perfect harmony.

"The very early and interesting 'Arquilla de los Reyes,' the reliquary of King Alfonso III (*el Magno*), and his Queen, Ximena, should properly have been mentioned earlier, but that its style and work are quite foreign to the Moorish taste. Alfonso the Great reigned as King of the Asturias and Leon from 866 to 910 A. D., and the shrine is therefore interesting as an authentic monument of a period of which few remains exist, though it can scarcely be said to have high claims as a work of art. It is of the usual oblong form with pyramidal lid and nearly covered with silver plates embossed and otherwise ornamented. Upon the lid is the inscription '*Aldefonsus Rex Scemenu Regina*,' with a figure of the Agnus Dei between the two names. Upon the sloping sides are embossed the symbols of the Evangelists, Lucas and Iohann being upon the front slope (the eagle very like a dove), and the angel of St. Matthew on the left, with the word Angels in place of the name of the Evangelist. On the slope at the back is a cartouche or frame of the last century, with the names of the Saints Diodorus and Deodatus, whose relics were doubtless contained in the shrine. The front is in two stages, each consisting of six round-headed arches formed of cloisons, some of which still contain the triangular or pear-shaped slabs of glass and stone, with which originally all were embellished. Within the arches are, upon the upper ranges, embossed trees or plants more or less symmetrical, and in the lower, figures of angels facing the middle, three in direction. The execution is throughout of the rudest character, the figures of the angels being reduced to the most elemental representations of the human figure and their wings more like leaves than any feathered limb. The presence of the cloisonné work, as a survival of Visigothic methods, gives the object a peculiar interest, though it should at the same time be pointed out that it is not cloisonné enamel. There can be no doubt that the stones or glass were cut and placed in position without the application of heat, and do not therefore constitute enamel."

The description of other interesting altar ornaments is found in Mr. Read's paper: "The Cathedral of Astorga sends a very beautiful globular vessel of rock crystal, engraved in the East with elegant scrolls in relief. This is attributed, and probably with justice, to the eleventh century; its beauty is, however, much lessened by a seventeenth century gilt mount, which has transformed it into a tall 2-handled

\* This would serve equally well for Alfonso IV, whose Queen also bore the name of Ximena. This King abdicated in 927, and his Queen died in the previous year.

vase. An equally beautiful object, but by far different character, is the crystal *Navecilla*, a crystal ship on wheels, with elaborate Gothic mounts of silver gilt from the Cathedral of Toledo. It is about 15 inches in length, the body of the vessel made of rock crystal, above which is a considerable superstructure of silver gilt in which the ribs of the ship are indicated. At the prow and stern the bulwarks are formed of a band of elegant tracery surmounted by a cresting of leaves. The figure-head is a wyvern in full relief, and the keel is formed of a band of boldly modeled leaf-work. All the lines of the construction are very graceful, and the composition is pleasing as well as unusual. It is said to have been the property of *Dona Juana la Loca*, and probably became the property of the Cathedral as a votive offering. Another ship, of which the body is formed of a large turbo shell, is shown from Saragossa, but this, though very quaint, and of perhaps a somewhat earlier date, can not be compared for beauty with the crystal ship of Toledo."

The painted enamels can not be better described than by the pen of Mr. Read:

"It is somewhat surprising to find among the ecclesiastical objects from the various cathedrals so few painted enamels that are worthy of note. A good triptych belonging to the Cathedral of Saragossa would seem to be from the hand of Nardon Penicaud or of his school. The central subject is of the Adoration of the Magi, painted in the usual manner, the faces somewhat round, and here and there the small raised jewels or rosettes backed with foil. The Conde de Valencia has also a triptych by the same artist, who seems to have been popular in Spain, to judge by the comparative frequency of his works. Three other enamels in the collection shown by the Conde de Valencia de Don Juan are, however, of far greater interest and beauty. The first of these is of North Italian work of the fifteenth century, a circular pectorial medallion, with a hinged front displaying both inside and out scenes from the Passion painted in the exquisite style characteristic of this period and country, and of which we have a few good examples in the British Museum. The back of this charming pendant is formed of a plate of pearl shell engraved with the Crucifixion, and every part seems in perfect preservation. The two other enamels are of Limoges, the more important being a brilliant triptych, unsigned, but doubtless by Leonard Limousin, the second an equally brilliant but small plaque painted by Pierre Reymond in 1537, with the Good Shepherd giving crooks to the shepherds, and the exhortation to the shepherds is inscribed in two panels at the top. The triptych represents the Last Supper, and has the arms of Lorraine beneath quarterly and an inescutcheon of pretence of Lorraine, while on the wings are the arms of Lorraine (on a bend three alerions) and those of France, as well as a motto, which would point to the piece having been made for a personage of distinction. The Conde de Valencia also exhibits a large and interesting series of the small *champleve* enamel plaques from horse trappings, most of which have devices of an armorial character, both Moorish and Christian. These little ornaments were used in all European countries in mediæval times, and a large number, such as are to be found here, could scarcely fail to produce some interesting results, if time were given to their study.

"The absence of any large number of Limoges or Italian enamels is not so surprising as the entire want of Flemish plate of the period of Charles V or earlier. There are no doubt some pieces which, on examination, would prove to be of Flemish manufacture, but there is certainly nothing like a display of such objects, and it seems scarcely credible that great quantities of church plate and objects of domestic use were not brought from Flanders, a country where art of this kind had attained to such perfection."

Mr. Read also describes two famous historical Arab standards, which I will give in his words:

"The Monastery of Las Huelgas at Burgos has sent one of its greatest treasures in the standard of the Almohade Sultan, captured by Alfonso VIII at the famous battle of Las Navas in 1212, a wonderful specimen of Arab silk weaving, still pre-

servicing in many parts the original colors. Though much restored it still possesses the most important of its original features. It is covered with verses of the Koran, the Mohammedan formula and other Arabic inscriptions. This precious relic is traditionally stated to have been given by the victorious King to the monastery which still possesses it, and it is only used in the procession of Corpus Christi. Señor Riano thinks it probable that 'Alfonso VIII' should be 'Alfonso XI' (1312-1350), as he considers the banner to be of the fourteenth century work. An appropriate pendant to this comes from the Cathedral of Burgos, the standard of Alfonso VIII carried at the same battle, or, to speak more accurately, all that now remains of it, representing the Crucifixion, the Virgin, and St. John.

"An Arab standard of similar work to the first belongs the Cathedral of Toledo. This is the *Bandera del Salado*, made in Fez in the year 1312 A. D. The central design is very original, and the combinations of colors singularly beautiful. It is formed of sixteen crescents of gold, arranged in four lines, each having within it, in white on a green ground, the Mohammedan formula repeated eight times, each crescent containing one-half of the formula; and around is a broad border formed by chapters of the Koran, written in intertwined Cufic letters. The effect of the alternating tints of gold, green, red, and white, which appear to be little affected by time, is very rich and harmonious."

The rich armor was very striking. Among the collection was noted a complete Gothic armor of the fifteenth century. Another suit of the same century had a helmet with a human mask. The jousting harnesses of Charles V and Philip II, elaborately chased and plated with gold, were displayed on manikins of horse and rider. There were also a number of figures showing the equipment of the foot soldiers of the fourteenth to the sixteenth centuries. On the walls were helmets, trophies of swords, daggers, arbalests, coats of mail, helmets, etc., displaying a remarkable richness in form and ornamentations.

Señor Don José Estrech, of Barcelona, sent a fine series intended to show the history of arms and armor from the eighth century down to the present time.

Among other pistols, muskets, and firearms, chased, incrustated, and damaskeened, was the pistol of Charles V, made by the famous Peter Pech.

The sword of Pizarro and of Cortes, with weapons and armor stated to be those of the conquerors of Peru, formed an interesting group.

Several swords of Boabdil, the last Moorish King of Granada, shown are of remarkable artistic value as well as of romantic interest. They are thus described by Mr. C. H. Read:

"One of them has been already mentioned as coming from the Royal Armoury but it is plain in make, and its principal interest is its history. It is far otherwise with the beautiful swords belonging to the Marques de Viane and the Marques Campotejar, and another sword belonging to the Archæological Museum of Madrid, though somewhat older, belongs to the same class. This last is made entirely of metal, the hilt and guard being of bronze with gilt details, the blade of steel, the total length 40 inches. The pommel is globular, flattened on the two faces, on each of which is a circular medallion engraved with ornamental Cufic characters; the grip is fusiform, engraved with circles joined together by a single twist, and containing also Cufic letters. The guard is of the peculiar form characteristic of the Moorish swords of the late fifteenth century, viz, rounded shoulders ending on either side of the blade in a narrow limb running parallel with it, the outer edge of the limb curving inward to the end, where it suddenly turns outward in a hook, the hollow formed by this curving of the limb being filled up in this case with a plate of metal pierced with circular holes. The faces of the guard are quite flat, and engraved with conjoined circles, like those on the grip, the spaces between them being filled with engraved floral designs. The bands forming the circles are in all cases gilt. The blade is straight and two-edged and has upon one face the stamp of the armorer, a circle containing badly written characters which have

not yet been read, but they are conjectured to be Hebrew, from the fact of the Jews in Spain devoting themselves to the manufacture of arms. This sword came from the Church of San Marcelo, the warrior saint, at Leon, and was there long connected with him. It is believed that it may have been a gift by the King Ferdinand the Catholic on the translation of the body of the martyr from Africa. The Boabdil sword of the Marques Campotejar is of the same general type, but is infinitely more sumptuous in execution, and, in addition, it retains its scabbard complete. The mounts, both of the sword and scabbard, are of silver gilt, embossed and richly chased with formal floral designs of the same style as those of the ivory casket of the Cathedral of Palencia (*supra*, p. 24), though, of course, the sword is of a much later date. The mounts are further enriched with bands and medallions of translucent cloisonné enamel, a feature which this sword has in common with that of the Marques de Viane. An interesting, and to some extent peculiar, circumstance connected with this sword is that, notwithstanding the pure Moorish character of its ornament, yet it would seem to have been the work of a Christian artificer, working for the Moors at Granada. The bonds of amity which existed between Boabdil and Ferdinand, for some years before the final stand made by the Moors for the possession of Granada, would account for the presence in the Court of Boabdil of Christian workmen, who doubtless succeeded in serving two masters in different capacities. Upon the plain backs of one of the two tabs to which the sword belt was attached is stamped, in characters of the period, the name *Ivan Abad*, with the pomegranate of Granada, as well as another stamp not easy to interpret. This Christian stamp illustrates a remark of Señor Riano (in his introduction to the Catalogue of Spanish Works of Art in the South Kensington Museum): 'The continued contact of the Christian and Mohammedan races, notwithstanding the barbarism of the time and the difference of creed, did not oblige them to live perpetually as enemies. This contact could not fail to influence works of art and industry, and for this reason many archaeological objects of the Spanish Middle Ages possess a peculiar character.'

"The third sword of this type and, like the last, once the property of Boabdil, is that belonging to the Marques de Viane, who exhibits also the velvet jacket, another sword, and a dagger, stated to have been taken from the Moorish King at his defeat (in 1492) and given by Ferdinand the Catholic to one of the ancestors of the present owner. One of these is the most perfect example in the exhibition of the refinement and richness of effect of which Arab art is capable. It combines the highest efforts of the enameleer, the carver, and the goldsmith, and doubtless the blade is of corresponding quality, and in every part it is well preserved. The actual grip is of ivory, the rest of the hilt is of gold, entirely covered with granular work and filigree, in which are set at intervals eight pointed and craneiform panels of translucent cloisonné enamel. The ivory grip is deeply carved with geometrical designs forming panels of various shapes, filled with Arabic inscriptions alluding to the weapon, and ornamental leaves and other devices, and where the ivory joins the metal are two broad bands of cloisonné enamel (the cloisons being here, as upon other parts of the mounting, of gold) composed of scroll work of the greatest beauty, interrupted by shaped panels containing Arabic inscriptions, among which might be expected the name of the artist, but this nowhere appears. The pommel is spherical, but at the upper end is prolonged as a straight point, and is entirely covered with the granular work and enameled panels mentioned above. This granular goldsmith's work is of the same style as that of the bands of the Persian casket from the Cathedral of Saragossa and might in fact be the work of the same artist. The ground is filled with minute pellets of gold, through which run lines of Arabic inscriptions, outlined in flat gold wire, thus leaving the interior of each letter empty. The enameled crosses upon the pommel are changed into a different form by the exigencies of the shape of the pommel, the artist finding it necessary to reduce the four limbs of the cross to three, and the corresponding outlines of the

eight pointed panels are ingeniously altered and adapted to the same end. The surface of the guard is ornamented with similar work, and it is only necessary to mention that the two ends running parallel with the blade terminate in the heads of monsters, from each of which springs an elegant openwork border of spiral scrolls, enameled in white and other colors. The blade is straight, and has the stamp of the armorer upon one side. The sheath is of red leather, though very little of this foundation is visible, as one-half of its length is hidden by mounts matching those of the sword itself, and these fit into each other so closely that when the sword is in the scabbard it is impossible to distinguish where the guard ends and the scabbard mounts begin. This sword is described, and the inscriptions are given, by Señor Riano, p. 81.

The enameled details upon this sword are of peculiar interest, not only for their intrinsic merits, which are very great, but also as serving to decide the origin of the beautiful stirrups in the Forman collection. These stirrups were exhibited before the Society of Antiquities of London, and are described in their proceedings (Vol. xiv, 169). It is sufficient here to say that they are of Moorish form, of iron, plated with silver, which is engraved with Oriental designs, while upon the sides are semicircular plates of silver with nielloed designs somewhat in the style of the arabesques of Aldegrever. Around these are borders of cloisonné enamel on gold, in style and execution so like the sword just described that there can be little question as to their common origin, though it is probable that the sword is earlier in date by perhaps a quarter of a century. The niello plates of the stirrups also could very well be of a Spanish make, as the use of the niello is not uncommon, both in Moorish and Christian work of medieval and later times. An example of this is near at hand, in the second sword shown by the Marques de Viane. This is more a weapon for use than for parade, and is a simple form, by no means beautiful, though the details are planned and carried out with the greatest skill. Like the other, it has a straight blade, apparently also of Christian make, or at least not Moorish; the handle is entirely of ivory, the grip cylindrical, with a thicker cylinder above and below, and forming the pommel, being slightly curved inward at the sides. The whole handle is engraved with beautiful scroll work, brought into relief by an inlay of black substance, probably akin to niello, and upon the sides of the pommel is the shield of arms of the kings of Granada, as seen upon the azulejos of the Alhambra. The scabbard is in keeping with the modesty of the sword, being a plain leather sheath, tooled like a bookbinding with a scale pattern, and having a silver mount and chape, the former engraved and nielloed with Arabic inscriptions and the shield of Granada, and the chape engraved in a similar manner. The contrast between this simple and useful weapon and the gorgeous blade shown beside it is most remarkable and instructive, and the fortunate owners of them both may be congratulated on the possession of hereditary treasures of a kind and quality but seldom seen.

There now remains to notice the collections of pottery, which are confined almost entirely to the lustered wares so well known and so highly appreciated all over the world for their decorative qualities. Before describing these, however, it is desirable to allude to an altogether unexpected, though by no means unimportant, exhibit of mosque lamps of pottery and glass sent by the Imperial Ottoman Museum at Constantinople. Of the pottery lamps the most curious, though the least ornamental, is one with two rows of handles, covered with oil gilding, and decorated only with two narrow bands of inscription in blue, the rest of the surface being plain white: probably a product of the potteries either at Cairo or Damascus. Far more beautiful, and of unusually large size, are two richly-colored lamps of Rhodian ware, with bosses round the lower part filled with elegant arabesque designs, the rest of the surface covered with inscriptions and ornament. The red and turquoise colors are of unusual brilliancy, and the execution of the ornament, as well as the outlines of the lamps themselves, leave nothing to be desired. Four small lamps, painted entirely

in pale blue, though neither so unusual nor so immediately attractive, are fine specimens of their kind. Their principal decoration consists of bands of ornamental Cutic, the spaces between being filled with delicately penciled devices that recall the illuminated Persian manuscripts of the fifteenth century. The glass lamps seem to be of Venetian manufacture, and probably of the fifteenth or early sixteenth century. They are all of lace glass of various patterns, somewhat coarse in make, and they preserve the usual form of the mosque lamp. In addition to these there are two trumpet-shaped lamps of the same kind of glass, which have been used either as the oil receptacle of a pottery lamp or perhaps independently, as they would be too large for any but the largest size of lamp. Some of these Venetian lamps have been thought by their Mussulman owners to be too simple in style, and accordingly they have been painted with flowing scrolls in gold, which gives them rather a tawdry appearance.

Of Spanish wares the only collections of any note are those of the Conde de Valencia de Don Juan, Señor Don Guillermo de Osma, and of the Archaeological Museum of Madrid. Unfortunately the latter collection must be dismissed with but little notice, for the objects were arranged in panels upon the walls of the room, reaching to the ceiling, and it was therefore barely possible to see them, and quite out of the question to examine any of them closely. One of the plates is said to have an Arabic word upon it, a most unusual thing, but as it was at least 12 feet from the floor it was not possible to verify this statement, which has already been doubted. Among the objects nearer at hand was, however, one of the famous Alhambra vases, a fine specimen standing more than 4 feet high, but unfortunately wanting one of its handles. It is decorated in yellow or pale blue, with a profusion of arabesque designs and inscriptions, one of the latter referring to its use as a water jar. This vase came from the parish church of Hernos (Jaen), where it was used as a holy-water vessel. A similar story is told of an equally fine vase, now in the museum at Palermo. Another jar of Toledan make is interesting as bearing the name of the maker. It is an oviform vessel of common clay, nearly 3 feet in height, unglazed, and with two projecting ears or handles on the shoulders. The ornament consists of impressions from oblong stamps, with animals, monsters, etc. Near the neck are impressed three stamps inscribed in black letter *en toled me fei dj perez*. This dates probably from the sixteenth century.

The collections of the Conde de Valencia and Señor de Osma are shown together, and comprise a superb series of the lustered wares of the various Spanish factories, a number of tiles, interesting for their devices as well as for the technical processes of their manufacture, and a large and unique series of a curious ware believed to have been made in Andalusia in the fifteenth and sixteenth centuries, but of which the history is at present somewhat uncertain. Among the lustered wares the most remarkable pieces are two dishes painted in blue and luster, with figures in fantastic costumes of the fifteenth century, one of the dishes representing a fishing scene, carried around the dish in a quaint fashion. Two covered bowls are also worthy of remark, both from their rarity and the originality of their design, the covers being of the same shape as the bowls, but somewhat larger in the mouth, and when placed together the form is that of a barrel with narrow ends. Many other pieces of this beautiful series deserve mention, if space permitted. The Andalusian ware, however, is less known, and therefore deserves more particular notice. Though it can scarcely be said to possess so great a charm as the lustered wares, yet it has an originality and vigor which is rarely found in any but the earliest productions of Valencia and Malaga. It recalls in appearance the Italian *sgraffiato* wares, though the process of manufacture is of quite a different character. The method employed is, however, not quite clear, but seems to have been to draw the outlines of the design in some substance which was thrown off in the furnace, leaving little or no trace of its presence, but which, before the firing, possessed an antipathy to the colored glaze used to fill up the design, so that these glazes could be applied close up to the



edge of the outlines without in any instance impinging upon them. In no case is the clearness of the outline interfered with, though it is rare to find an instance of the glaze being otherwise than close to its edge. The glazes are thick and heavy, probably with a base of tin, and the colors used are rich and full—amber, green, slaty blue, yellow, and manganese. The collection comprises five large dishes, twenty-four small, an oviform vase, two large panels with the arms of Castile-Leon and Aragon-Sicily, as well as tiles. The designs of the dishes are vigorously, if somewhat coarsely drawn, and include a head of a young man in the costume of the late fifteenth century, a deer and other animals, heraldic lions, and motives derived from plants and trees. Some of the tiles have inscriptions in black letter, and the oviform vase bears the legend, *Mjel rosado coad* (Honey of roses). It may be of interest to mention that this ware is being imitated in Spain at the present time, and a good many examples of these imitations are to be found in the shops in Madrid; and though the character of the work lends itself easily to imitation, there are essential differences between the old and the new."

There were few musical instruments. Two organs of Charles V, shown for their artistic cases; a Moorish rebeck of four strings, and a clavichord may be mentioned. The latter is one of the most curious musical instruments belonging to the history of music in the seventeenth century. The instrument exhibited is said to have been made in 1625 by Fraz Raymundo Truchado. I heard several performances upon this instrument and found the music not unpleasing.

Of music books there was a great number, the ponderous illuminated missals of the Escorial and other cathedrals forming an attractive exhibit. A MSS. of the thirteenth century, entitled "Himnos Religiosos," is interesting as showing early part music. The MSS. is preserved in the National Library. Another folio in vellum from the Cathedral of Tuy contains the psalms of St. Augustine, with the first page of ancient music without the pentagram (*Sin pentagrama*).

There were in the exposition numerous documents relating to the history of the discovery of America, consisting of letters, charts, books, etc. The Papal exhibit contained two famous charts on vellum of the Old and New Worlds, made in the third decade of the sixteenth century. The better preserved map measures 85 centimeters in height and 2.09 meters in width. It bears the inscription: "*Carta Univerſal en que se contiene todo lo que del mundo se ha descubierto juſta agora, hizola Diego Ribera, cosmógrafo de Su Mageſtad, año de 1529, en Sevilla. La qual se deriva en dos partes conforme la capitulacion que hicieron los Catholicos Reyes de España e el Rey Juan de Portugal en Tordesillas, año de 1494.*" On either side of the line showing the division of the New World between Spain and Portugal are the banners of these countries. In Peru the conquest had extended to Sierra Morena, on whose southern border is written in red ink the name of the last people then known, Chinea Cibad—that is, the city of Chinchu, founded by Almagro.

The other chart is perhaps older. It bears the famous line of Alexander VI. It shows the plan of the City of Mexico and the illuminated portraits of Montezuma, Atahualpa, and Prester John, of the Indias.

The National Library exhibited 150 manuscripts comprising Greek, Persian, Hebrew, and Arab codices, bibles, liturgical, and devotional works; works on science, art, history, geography, literature, and the theater, autographs and codices notable for the importance of the text, binding, ornamentation, etc.

Among the Hebrew manuscripts is an interesting Book of Esther, which the Jews read on feast days. It is a roll of parchment 3.50 meters long and 29 centimeters wide, dating from the beginning of the fourteenth century, written in 24 columns of 22 lines each.

Among the numerous Arabic manuscripts was the book of Alfarabi, entitled "Music," which explains the beginning of music, voices, tones, and instruments. It contains drawings of instruments and figures of music. This remarkable codex of the fourteenth century is the best of the three existing in Europe, one being in the Ambrosiana at Milan and the other in Leiden.

The first edition of the polyglot bible of Cardinal Cisneros dated 1514-1517 and the only copy of the first edition of Don Quijote were shown.

A few Jewish relics of interest were displayed. One of these was a precious fragment of a roll of the Torah or Hebrew Pentateuch of the fourteenth century, which no doubt belonged to an ancient Spanish synagogue. The fragment contains the last chapters of the Book of Leviticus and the first chapters of Numbers. Another book from the Cathedral of Toledo, written in rabbinical characters, had "*73 hojas de arbol llamado Parra van ensartadas en una cuerda.*"

There was an astrolabe of burnished bronze made by Philip II in the sixteenth century, as the inscription shows.

There was a beautiful mosque lamp from the Alhambra, composed of four parts, the upper formed by four apples in delicate openwork combining the motto of the Al-Ahmares; the second below a kind of pyramidal chimney, each face of one, engraved fretwork; the third section is a large screen composed of four wings fretted and engraved with the Al-Ahmares motto in African characters; the fourth section is funnel-shaped, having attached eight fretwork arms. This lamp was ordered by the Sultan Mohammed III of Granada in the year 705 of the Hegira, 1305 A. D.

From the same city is an oil holder covered with very delicate work with enamel inscriptions in gold of the purest Grenadine handicraft. It dates from the fourteenth century. The pieces just described belong to the National Archaeological Museum of Spain.

From Leon were shown two torch holders of four lights. They are formed of a disk of plate iron with fretted ogival ornamentation. In the center of the disk the sockets to remove the links are grouped. These date from the fifteenth to the sixteenth centuries.

The Escorial sent a very beautiful lamp of bronze and coral of the seventeenth century.

Mention may be made of the unique series of royal, ecclesiastical, and municipal seals of wax and lead, the jewelry and miniatures and the large collection of artistic ironwork for which Spain is so famous.

The naval and military museums made an important chronological exhibit of their respective subjects.

#### THE WORLD'S COLUMBIAN EXPOSITION.

At the beginning of the fiscal year, preparations for the World's Fair had been in active progress for fifteen months, and many of the exhibits had been completed, mounted, provided with labels, and were being packed. Much progress had also been made in the construction of cases, and the taxidermists had finished a number of the most important groups of animals.

Uncertainty as to the amount of money which would ultimately be appropriated by Congress for our exhibit, and similar uncertainty as to the amount of space which would finally be available in the Government building, the dimensions of which had already been much contracted from those proposed in the original plan, owing to the costliness of building in Chicago, made it impossible as yet to decide exactly what would be sent. Indeed, the indefinite manner in which the appropriations were made was a cause of great embarrassment, since no positive plans could be made, and work, which otherwise could have been done deliberately and at moderate expense, was delayed until the last moment, to be finished in haste and at greater cost.

After the adjournment of Congress in August, the character of the exhibit was finally decided upon, and as soon as the Government building had been completed and the space allotted, the plans for installation were made. It was not until December, however, that the building was so far completed that the space could be studied with reference to the final arrangement of the collections.

The work of shipping began in February, and continued until late in April, when the last cars were loaded. Twenty-five earloads in all were sent, among the last being the collections returned from the exhibition at Madrid. The total number of boxes was 1,305, aggregating 145 tons, or more than a quarter of a million pounds.

The amount of space finally occupied by the Institution was 21,250 square feet, of which 5,875 feet were set apart for main isles or thoroughfares. This was much less than had originally been planned for, and necessitated the omission of many objects and the too great crowding of others. The work of installation was begun in March, at which time Mr. Earll, the special agent in charge of the exhibit, went to Chicago to remain through the Exposition. Sixteen expert mechanics and preparators went from the Museum in March, and about twenty additional mechanics and laborers were constantly employed in Chicago from that time until the installation was completed. Early in April a number of the curators went on to superintend the arrangement of their respective exhibits.

Notwithstanding the delays of the railroads, many of our cars having been three weeks on the way, the exceedingly inclement weather, which caused much sickness in the force, and the unfinished state of the building, and the showers of rain and snow which found their way through the roof upon the specimens as they were being unpacked and upon the polished wood and glass of the cases, the installation was practically ended before the opening of the Exposition, and at the time when the doors were thrown open there was every appearance of completion, although, owing to the causes already mentioned, a considerable amount of work had to be done in May.

At the end of the fiscal year the Exposition had run only one-third of its course, but the throngs of visitors\* and the appreciative comments of those qualified to judge of the merits of the exhibition indicate that notwithstanding the many difficulties which it has been necessary to face the participation of the Institution in the Exposition is a successful one.

The character of the collections sent is discussed very fully in the review of the work of the scientific departments of the Museum. The description of the exhibit as a whole will be deferred until after the close of the Exposition.

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\* "The popularity of the Smithsonian exhibit may be gauged by the difficulty that a visitor experiences in forcing his way through the almost immovable crowd." F. A. BATHER, in *Natural Science*, London, 1893.

The exhibits of the Smithsonian Institution were designedly selected so as to supplement and be supplemented by those displayed elsewhere in Jackson Park. It was our purpose to avoid all rivalry, and, so far as could be done without disobeying the implied requirement of the law, that the exhibits should illustrate all the functions of Government institutions, to show nothing which would be shown well by others.

In consequence, our exhibits can not well be considered except in connection with the others of a similar character. This has been well done by Mr. William H. Dall, in a series of three letters on "Science at the Fair," published by the *New York Nation*, as being the result of a careful review by an unbiased observer and the only really careful report of the kind which has been made.\*

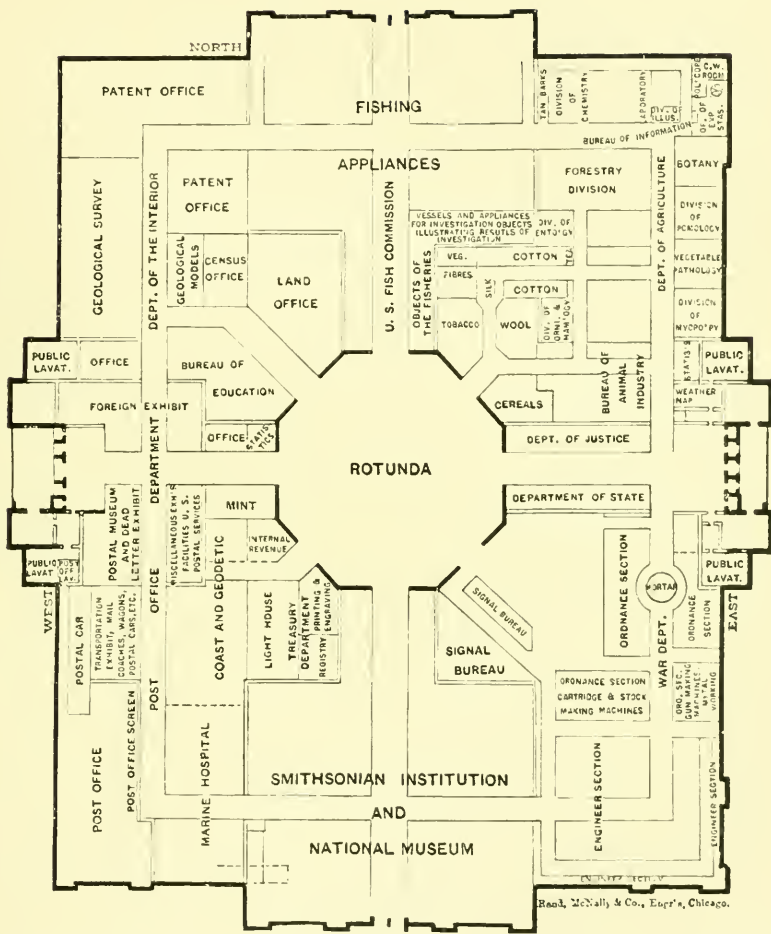
The accompanying diagram of the floor space of the Government building shows in a general way the assignment of our space and its relation to that occupied by the other Departments of the Government. (Pl. 56).

The exhibit of the Government was made under the direction of a board of control and management, appointed by the President in accordance with an "Act providing for the celebration of the four hundredth anniversary of the discovery of America by Christopher Columbus," etc., approved April 25, 1890.† This board was composed of one member representing each Department. At the beginning of the Exposition the board was composed of the original appointees, as follows: Sevellon A. Brown, Chief clerk, Department of State; A. B. Nettleton, Assistant Secretary, Treasury Department; Maj. Clifton Comly, U. S. A., War Department; Commodore R. W. Meade, U. S. N., Navy Department; A. D. Hazen, Third Assistant Postmaster-General, Post-Office Department; H. A. Taylor, Commissioner of Railroads, Department of the Interior; E. C. Foster, General Agent, Department of Justice; Edwin Willits, Assistant Secretary, Department of Agriculture; J. W. Collins, Assistant, U. S. Fish Commission, and G. Brown Goode, Assistant Secretary, Smithsonian Institution; but shortly after the opening of the Exposition Mr. W. E. Curtis became the representative of the Department of State, Mr. F. A. Stocks of the Treasury, Prof. F. W. Clarke of the Interior, and Dr. Tarleton H. Bean of the Fish Commission.

The functions and responsibilities of this board were very different from those of the boards previously charged by Congress with the preparation of Government exhibits, and it remains to be seen whether the change is altogether advantageous, either in the matter of efficiency or economy. In previous exhibitions the representative of each Department has been looked upon as the representative of its official head, and the Government exhibit has been an assemblage of indi-

\* DALL, W. H. The Columbus Exposition.—Science. *The Nation*, Sept. 14, 21, 28, 1893.—(Nos. VII-IX of *The Nation* series of letters.)

† See Appendix IX.



GROUND PLAN OF THE UNITED STATES GOVERNMENT BUILDINGS AT THE WORLD'S COLUMBIAN EXPOSITION, 1893.



vidual exhibits, each illustrating, under the control of the Department itself, its functions and administrative methods.

The Chicago board, apparently rather through the decisions of the Treasury Department than by reason of the intent of the law, has been forced into quite another position. Under the provision of section 18, which subjects the "itemized accounts and vouchers" to the approval of the Secretary of the Treasury, jurisdiction in detail over the affairs of the board was assumed by officials of that Department, and their rulings have formed, of necessity, the dominant standard of judgment. By virtue of an early ruling based upon the provision of section 16, which empowers the heads of the Executive Departments and the directors of the Smithsonian Institution and National Museum, and of the U. S. Fish Commission, to designate the articles which should compose the contributions of their respective branches, the initiative in respect to each article exhibited was vested in the heads of the branches. The power of final approval was retained in the Treasury, the board of management serving as an intermediary between the two authorities.

It is held by the Treasury that the board as a whole is responsible for the exhibit as a whole, and that the relation of the heads of the Executive Departments to the board and to their own individual representatives is advisory rather than supervisory. The tendency of this is to place the members of the board at times in embarrassing positions, and in at least one instance has resulted in a complete alienation of the Exposition work of a department from the Department itself, and an open hostility between the head of the Department and his representative. Nothing could be more unfortunate, and nothing could more thoroughly prevent the preparation of an exhibit which would be thoroughly representative.

In connection with this policy has grown up also a disposition on the part of certain elements of the board organization to criticise the conduct of the representatives of the Departments, and to attempt to control their action under the plea of "securing harmony and preventing duplication." The outcome has been far from satisfactory, when contrasted with the direct, business-like, and less complicated methods followed by previous boards of management.

The appropriation of an aggregate sum by Congress, instead of a special appropriation to each Department, has also been a cause of embarrassment. It is quite impossible for ten men, representing ten distinct interests, to divide such a sum among themselves equitably and to the satisfaction of all. Still more perplexing, especially in the early days of the preparation for the Exposition, were the joint claims upon the same appropriation of the Government board of management and of the National Commission. This was fortunately settled by Congress in 1891, but the uncertainty as to the amount of money available during the first year of preparation was not the least serious of

the many obstacles to effective work at the most important period of exhibition work—the beginning.

It should also be said that the establishment of a board with independent functions and a separate legal status seems likely to prove a source of expense for general purposes, far greater in proportion than has been found necessary in other exhibitions.

In addition to the \$400,000 appropriated for the building, the aggregate of the allotments for the use of the Government board was \$949,000, of which amount 5 per cent, or \$47,450, were set apart for the general expenses of the board of management, the remainder being allotted among the several Departments. The amount available for the use of the Smithsonian exhibit, after deducting the 5 per cent contributed toward the expenses of the board, was \$133,807.50.

By the provisions of a joint resolution approved March 3, 1893,\* the secretary of the Smithsonian Institution was authorized to prepare and send for exhibition in the Woman's building any articles from the Museum illustrative of the life and development of the industries of women. In accordance with this authorization, a special exhibit was prepared and installed in the Woman's building under the direction of Prof. Mason. The character of this exhibit is described in the discussion of his department.

The original model of the colossal statue of Leif Erikson (the property of the city of Boston), which had been presented to the National Museum by the sculptor, Miss Anne Whitney, was also installed in the Woman's building at the request of the Board of Lady Managers, as well as a collection illustrating the history of lacemaking, prepared by Dr. Thomas Wilson.

Very many requests were made by the authorities of the Exposition and by exhibitors for the loan of objects from the Museum, to be exhibited elsewhere than in the Government building, but these were without exception refused, on the ground that the Government had already provided for the exhibition of such objects as could be sent from Washington in a special building which was more nearly fireproof than any other on the grounds, and that there was no legal authority for allowing the Museum material belonging to the Government to pass out of the custody of its officials. This limitation did not, of course, apply to the Government building. Specimens were lent to almost every department of the Government, especially to the Fish Commission, the Patent Office, the Geological Survey, the War Department, the Department of Agriculture, and the Treasury Department. Certain historical objects were also placed in the Convent of La Rabida, which was recognized as a Government building, forming part of the exhibit of the Department of State.

It was perhaps regarded as a hardship by the officials in charge of the Anthropological building that material should not have been sent from the Government collections to swell the very interesting miscella-

\* See Appendix IX.



neous display of ethnological objects which were gathered there, but setting aside the question of lack of legal authority, this building was especially open to the objection of not being fireproof. Everything possible was done, however, to avoid interference with this department, by refraining from exhibiting in the Government building objects of a kind similar to those which we were informed would be shown by the Exposition authorities.

The ethnological and archaeological collections in the Smithsonian space were the joint exhibit of the Museum and the Bureau of Ethnology, and too much can not be said of the enthusiastic work of Maj. Powell and the officers of the bureau in the development of this portion of the display, and especially in the preparation of the group of costumed figures of the aborigines of North America.

In addition to the exhibits sent from the Museum and the Bureau of Ethnology, a special alcove was devoted to the exhibit of the Smithsonian Institution and its methods of work. Here were shown photographs of the Smithsonian and Museum buildings; portraits of the three secretaries—Joseph Henry (1846-1878), Spencer Fullerton Baird (1878-1887), and Samuel Pierpont Langley; the publications of the Smithsonian Institution, including the Annual Reports, the Smithsonian Contributions to Knowledge, the Miscellaneous Collections, the Reports of the National Museum, together with the Proceedings and Bulletins; publications of the Bureau of Ethnology; the publications of the National Academy of Sciences; the Reports of the American Historical Association (affiliated with the Institution), and the reports of the various scientific expeditions which have been conducted under the direction of the Institution. There was also a screen of photographs illustrating the discoveries of Prof. Henry, including those which led to the invention of the electric telegraph.

It had been intended to publish a series of popular handbooks explaining the various collections exhibited, and also illustrated pamphlets in regard to the Smithsonian Institution and the Museum, but the regulations issued by the local directory governing the distribution of books and catalogues were found to be so oppressive that this was abandoned, although much work had been done in the preparation of this feature of the exhibition.

By the action of the Local Directory of the Exposition the whole matter of catalogues and illustrative literature was placed in the hands of a single firm of printers, who were unwilling to print anything without a guaranty that their sales should considerably exceed the cost of printing, and who refused to allow other publishers to enter the field. This illiberal policy undoubtedly reduced very largely the extent of the literature which usually grows out of such expositions, and is not only its chief educational agency, but one of its most important permanent results, and it is to be hoped that no future exhibition will be led into a similar error.

Acknowledgment should be made for assistance rendered by a number of friends of the Institution, who by their advice and cooperation, or by the loan of objects for exhibition, contributed materially to the success of the occasion.

Mr. George F. Kunz assisted by his advice in the forming of the collection of gems and animal products, and lent from his private collection a number of Russian eikons, shown in the collection of religious ceremonial objects.

Tiffany & Co., of New York, lent an extensive collection of leathers, prepared from the skins of animals not ordinarily used in the arts, which was displayed among the animal products, and, as has always been our experience on occasions of exhibits, exhibited a spirit of genuine interest in the work.

Dr. Marcus Benjamin, of New York, lent his collection of portraits and autographs of the members of the National Academy of Sciences, and Mr. Albert Rosenthal assisted in the formation of the collection of American historical portraits.

Walter H. Harris, esq., ex-sheriff of London, and one of the Royal Commissioners from Great Britain, lent his unique collection of British war models.

Mr. Hieromich Shugio lent a number of Japanese porcelains and arranged the synoptical collection showing the history of the ceramic art in Japan.

Mr. Fritz Kaldenberg, of New York, lent his collection of carved and tinted ivories, and in other ways helped to build up the collection of animal products. Mr. Sulzberger, of Philadelphia, and Mr. Hadji Ephraim Benguiat, of Boston, aided materially by loans from his private collection to the collection of religious ceremonials.

Acknowledgment is also due to the officials of the exposition in general, and especially to Mr. George R. Davis, Director General; to Mr. Lyman J. Gage and Mr. William T. Baker, during their terms of presidency of the Board of Directors; to Mr. J. W. Ellsworth, a member of the board; Mr. Benjamin Butterworth, the first secretary of the board, and to his successor, Mr. H. O. Edmunds; to Mr. Frank D. Millet, director of decorations, and to Mr. W. H. Holcombe, general manager of transportation, for numerous courtesies.

To the members of the Government board the staff of the Institution were indebted for many acts of courtesies.

Mr. William E. Curtis, as chief of the Bureau of American Republics, and subsequently as a member of the board, was especially helpful.

#### IV.—REVIEW OF THE WORK OF THE SCIENTIFIC DEPARTMENTS, INCLUDING THEIR PARTICIPATION IN THE WORLD'S COLUMBIAN EXHIBITION.

##### DEPARTMENT OF ARTS AND INDUSTRIES.

The Department of Arts and Industries was the immediate and necessary outgrowth of the erection in 1881 of the new building intended to receive the collections presented by foreign governments to the United States at the Centennial Exposition. Most of these collections could not with propriety be merged with any already in the custody of the Institution, since they were neither geological, biological, nor in a strict sense anthropological.

This new department was therefore formed, which was intended to include all the collections illustrating the utilization of the earth and its products by man, and the history and method of arts and industries within historic times. At first all the anthropological collections except those classed as prehistoric were administered by this department, but experience taught that there are large classes of objects which can be best exhibited and studied when arranged ethnically, and so in 1884 the Department of Ethnology was established.

The distinction between these two departments is not easy to define, and is really not very strictly observed, and will perhaps in time disappear. There are, however, certain classes of objects which either for effective installation or for convenience it has been found better to arrange with reference to form rather than race. These are as a rule those in which the arts of civilized man are predominant, and which possess some special interest when arranged in progressive, or, as they are sometimes in questionable propriety called, "evolutionary" series. Among these are such collections as those of musical instruments, land transportation, the models of boats and vessels, and the fishery appliances.

Closely allied to some of these is another group of collections, properly technological, in which the idea of materials, and tools and processes of manufacture, together with the products of the processes, are the most prominent.

It was at one time intended to develop this part of the Museum to such an extent that every product of the earth useful to man—mineral, vegetal, and animal—should be shown, in its natural condition and in the various stages through which it may pass, in preparation by man for his own use, together with the tools employed and illustrations of processes. This project has not yet been fully realized, chiefly through

lack of room, though also because of practical difficulties of arrangement and installation. It has not been abandoned, however, and the Museum possesses the materials for an extensive technological display.

In the meantime the specimens of this class derived from the mineral kingdom are incorporated with the geological collections, those from the vegetable kingdom with the textile, materia medica, and food and forestry collections, besides a great mass now in storage, while those from the animal kingdom, with the exception of what are arranged with the textiles, medicines, foods, and fishery collections, are brought together in the animal products collection.

It is still an open question whether technological material is not more useful and instructive, distributed among the scientific departments, than set aside in a special series. At the present time, this is the only practicable plan. If it were possible to employ a special staff of technological curators, trained to appreciate and to keep abreast of the mechanical and chemical processes of modern industrial arts and manufactures, and the arts of design connected with their development, the case would be different.

When the need shall be felt for a technological museum in Washington, one of the best in the world can be erected upon existing foundations, with comparatively slight expense and in a very short time.

In addition to those mentioned, there are certain other collections which are still assigned to the Department of Arts and Industries, which it would be difficult to place elsewhere—those composed of objects made by civilized man, in which the idea of beauty predominates over that of utility. Here belong porcelains, pottery, bronzes, enamels, lacquer, laces and tapestries, musical instruments; in part, costumes and their accessories, and the collections illustrating the graphic arts.

Such objects are often arranged in art museums, but may with equal propriety remain in contiguity with ethnological collections, with which they have innumerable points of contact. Indeed the separation of the æsthetic from the industrial and ethnical series is, in the case of æsthetic races like those of eastern Asia, merely arbitrary and a matter of convenience.

We value the specimens in an ethnological museum (writes Mr. C. F. Binns) because they reveal to us the manners and customs of a bygone age. We regard them as steps in education, as stages in the evolution of a people, but the moment that a work can be judged as artistic we remove it from the Department of Ethnography and place it upon a platform with the art work of all ages and all nations, to stand or fall by another criterion.\*

This is a fair statement of the practice of most museum workers. Whether it is entirely justifiable, either on scientific or æsthetic grounds, or is absolutely fair and advantageous, is a difficult question, which deserves full consideration.

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\*BINNS, CHARLES F.: The Elements of Beauty in Ceramics. *Journal of the Society of Arts*, XLII, 409, April 6, 1891.

In addition to all these, there are the collections whose interest is chiefly historical—personal relics, national relics, portraits, autographs, coins, medals, memorials of past periods in the history of our own and allied races. These stand in a group by themselves, and are in popular estimation more interesting than anything else that can be shown, and their influence upon the people who see them is not to be undervalued. They are surely not without instruction, and beyond this, tend to the development of lofty and ennobling sentiments.

In the report for this year, the various collections assigned to the Department of Arts and Industries, except those which are under the control of a special curator, will be referred to only in rapid review.

*Fisheries collection.*—The fishery hall has been almost dismantled by the withdrawal of material to form part of the exhibition of the Fish Commission in Chicago. The attention of Capt. Collins, the curator, has been for two or three years devoted to other things, and few additions have been made to the collection.

*The collection of naval models.*—This, too, has been drawn upon largely for the exhibit of the Fish Commission at the World's Fair, many of the models of American fishing vessels having been withdrawn to be combined with a large number of additional models which have been constructed by the Commission. The entire series will be returned at the close of the Exposition.

The general collection of models is one of the most extensive in the world, embracing, as it does, a very large number of boats of savage and semicivilized races, and material for a very full exposition of the vessels of America. The models of modern steamships and vessels of war are very few, and no attempt will be made to extend the collection in this direction until there is more space. Three times the amount of exhibition room now available is desirable for the proper display of this collection. Among the interesting additions have been models of the historic ships *Sally Constant* and the *Mayflower*, prepared by the National Museum for Chicago, and exhibited in connection with the historical relics.

*The animal products collection.*—This collection, already referred to as forming an important part of the technological material belonging to the Museum, was transported to Chicago in its entirety and was greatly enlarged. Much attention has been given to developing a collection illustrating the races of domesticated animals, and a specially good series of the breeds of domestic birds has been gathered. To secure the domesticated mammals is a more difficult matter, attended with great expense and delay. Even this would have been carried much further in Chicago but for obstacles interposed by the accounting officers of the Treasury, who objected to the payment of vouchers for the purchase of foreign material.

An extensive exhibit selected from this collection was sent to Chicago. This exhibit is intended to illustrate the utilization of the various parts

of the different animals and the uses of substances derived from the animal kingdom in the arts and industries. It includes the following:

Collections showing the utilization of hair, wool, bristles, etc.

Feathers, quills, and their uses.

Fish scales and articles made from them.

Tortoise shell and its manufacture.

Furs of various kinds.

Collection of leathers (including a loan collection of rare leathers belonging to Tiffany & Co., New York).

Horns and antlers and articles made from them.

Hoofs and claws.

Teeth of various kinds and collections illustrating the uses of different kinds of ivory.

Whalebone and its utilization.

Bone and objects made from same.

Shell, coral, and objects made from same.

Intestines and their utilization.

The collection of animal products is now fully equal to that in any other museum, not excepting the Bethnal Green Museum in London, which grew out of the London exhibitions of 1851 and 1862, and was classified and labeled under the direction of Dr. Edward Lankester. With proper space for exhibition, extensive enough to allow the addition of a series of the modern manufactured products, this collection would have great interest and educational value.

*The collection of fibers and textiles.*—This collection, which is tolerably complete, is being temporarily withdrawn from exhibition, in order to relieve the crowded condition of the building. The specimens are all admirably mounted and well labeled, and can, if necessary, within a week's time, be again displayed. Like the collection of animal products, it possesses much educational interest and is very attractive to visitors.

*The collection of foods.*—This collection, for which there is a great amount of material on hand, has never been developed for lack of room. It is especially rich in the food substances of the North American aborigines and of the Orient. A single group of objects from this collection was sent to the World's Fair. This included the cases representing the composition of the human body, the elements and chemical compounds which make up the composition of the man of average size, accompanied by supplementary exhibits showing a number of typical rations and the daily income and outgo.

*The collection of musical instruments.*—This collection has been nearly doubled within the past two years through the efforts of several of the U. S. consuls abroad and the collections made by the Assistant Secretary in southern Europe in the spring of 1892. A selected exhibit was sent to the World's Fair, which occupied a wall case 65 feet in length, and which was intended to show the method of installation adopted in the Museum and to illustrate the evolution of the various types of

musical instruments. This was arranged in accordance with the following plan:

Self-vibrating instruments:

Drums and tambourines, cymbal, gongs, castanets, "bones," and rattles.

Xylophones.

Stringed instruments played with the fingers or plectrum:

Guitars, banjos, and mandolins.

Harp and lyres.

Zithers and dulcimers.

Stringed instruments played with a bow:

The violin.

The viola.

Mechanical instruments—hurdy-gurdy.

Stringed instruments, with keyboard. The predecessors of the piano, clavichord, virginal, and harpsichord.

Wind instruments, with simple aperture or plug mouthpiece:

The trumpet and bugle.

The trombone.

The serpent and bagpipe.

Wind instruments, with bell mouthpiece, with keys—cornets, French horns, ophicleides.

Wind instruments with complicated systems:

Accordions.

Harmonicas and jewsharps

Hand organs.

As soon as this material shall have been returned from Chicago, a complete rearrangement of the collection will be made in the two great wall cases in the main entrance hall, whose combined length is 150 feet. This collection is one of the most extensive in the world, being especially rich in the instruments of savage and semicivilized races, and the primitive forms, which are especially interesting when arranged by the progressive method as showing the types from which, in all probability, all of our modern instruments are derived.

*Costumes.*—Especial attention was devoted in the early days of the Museum to the collection of costumes, especially those of historical interest. Such of these as have been placed on exhibition are at present arranged with the ethnological collection, but there are many others. It is probable that at the next exposition in which the Government participates, a special display from this department will be arranged.

*The collection of ceramics.*—This collection, though it contains many valuable and important specimens, is exceedingly incomplete and unsatisfactory. The Hippius collection of Chinese porcelains still remains on deposit, and it is hoped that through some good fortune this may in time become the property of the Government. It is recognized as one of the best for its size in existence, and is constantly examined by connoisseurs, who find in it material for study. There is also a small collection of Japanese porcelains, a selection from which was arranged and labeled by Mr. H. Shugio and exhibited by the Museum at the World's Fair. In this collection were shown typical products of each

of the principal pottery centers of Japan, arranged by provinces in accordance with the following plan:

*Ancient pottery.*

Province.	Ware.	Province.	Ware.
Hizen.....	Karatsu.	Idsumi.....	Idsumi.
	Arita.	Yamato.....	Akahada.
	Hirada.	Survo.....	Survo.
	Nangawara.	Nagato.....	Iiagi.
	Nabeshima.	Chikuzen.....	Takatovi.
	Kakiyemon.	Higo.....	Yatsushiro.
	Tsryi Gokushin.	Satsuma.....	Satsuma.
	Kameyama.	Settsu.....	Sanda.
	Bogasaki.		Kikko.
	Shraishi.		Kosube.
Tai-shiu (Island of Tsushima).	Tsushima.	Iwaki.....	Soma.
Owari.....	Seto.	Kaga.....	Kutani.
	Iloraku.	Ise.....	Banko.
Bizen.....	Bizen.	Sado.....	Sado.
Omi.....	Shigaraki.	Sauuki.....	Shido.
	Koto.	Yamashiro.....	Raku.
Kii.....	Zusshi.		Kioto.
Iga.....	Iga.	Musashi.....	Tokio.
Tamba.....	Tamba.		Ota.
Idzumo.....	Idzumo.		

In addition to the oriental porcelain and pottery, there are several smaller groups of objects, the most noteworthy of which is that illustrating the products of the imperial manufactory at Sèvres, presented by the French Government. This collection is of the greatest value to students of the decorative arts and to a large number of other visitors to the Museum, and it is hoped that it may receive extensive additions hereafter and be arranged in a hall by itself.

In this same connection, as occupying adjacent cases, may be mentioned the very instructive special cases of Japanese lacquer, showing the process of manufacture; of Japanese bronzes; of Russian and American casting in iron, and the cases of enamel and metal work presented by the Siamese Government. All these together form a nucleus which it is hoped in time will develop into a collection similar to that which is the chief glory of the South Kensington Museum in London, and which there has as yet scarcely been any effort made to reproduce in this country, save in the art museums of Boston, New York, and Cincinnati, whose plans, however, are somewhat different.

THE HISTORICAL COLLECTIONS.

A great portion of the time of Mr. A. Howard Clark, the curator, was necessarily devoted to his other duties as editor of the Proceedings and the Bulletins of the Museum, and in charge of printing descriptive labels, the year being the busiest in the history of the Museum in these



branches of work, so that it is impossible to report much special work accomplished in advancing the historical collections, except in connection with the preparation of the exhibits for the World's Fair.

The crowded condition of the exhibition halls has necessitated the withdrawal and temporary storage of the entire collections of medals and money, and the general series of autograph papers of eminent Americans. The collections of historical objects remaining on exhibition include memorials and personal relics of Washington, Jefferson, Adams, Van Buren, Jackson, Lincoln, Grant, and other Presidents of the United States, and of soldiers, statesmen, and other eminent Americans, as well as memorials of important events in American history.

There have been 70 accessions to the collection during the year, aggregating nearly 1,000 specimens. The principal objects were a folio Bible belonging to Gen. Washington, with his autograph on the title page; a large number of memorials and personal relics of President Andrew Jackson; autograph letters of Gen. J. E. B. Stuart, of the Confederate Army, and of Hon. G. W. Randolph, Secretary of War of the Confederate States; specimens of the earliest copper money coined in America, dating about 1525; medals presented by the corporation of the city of London, commemorative of events in the history of that city; commissions bearing the signatures of Presidents John Quincy Adams and James Madison; a large collection of engraved and photographic portraits of eminent Americans, and a collection of the decorations of the military and civic orders of Europe and America. It was hoped that a large historical collection might be arranged for the World's Fair, but it was impossible to accomplish all that was planned, owing to lack of exhibition space. The exhibits sent to Chicago included—

(1) About 1,800 engraved and photographic portraits of members of the Continental Congress, the Federal Convention of 1787, the first Congress of the United States, members of the National Academy of Science, and of other eminent Americans—statesmen, jurists, philosophers, Army and Navy officers, physicians, clergymen, educators, artists, authors, merchants, and philanthropists :

(2) Medals, nearly 600 in number, illustrative of American history from the earliest Colonial period through the Revolutionary war to events of recent years, collegiate and ecclesiastical medals, and medals in memory of eminent Americans :

(3) A monographic collection of the metallic money of the colonies prior to the establishment of the United States Mint :

(4) A monographic collection of the American colonial and Continental paper money, and paper money issued by State and private banks and by merchants :

(5) A series of early maps illustrating the development of geographical knowledge of America, and of the territorial growth of the United States ;

- (6) A series of water-color drawings, about 200 in number, of decorated powder horns carried by soldiers of the American Revolution ;
- (7) Models of the *Sally Constant* and *Mayflower*, the first passenger ships of the Virginia and Plymouth colonies ;
- (8) Engravings illustrating the settlement of Jamestown, Va., the landing of the Pilgrims at Plymouth, and other colonial and later events in American history.

#### THE GRAPHIC ARTS COLLECTION.

The collections illustrating the graphic arts have continued, as hitherto, under the care of Mr. S. R. Koehler, who divides his time between the National Museum and the Boston Museum of Fine Arts, where he has similar responsibilities.

Nearly all the time available during the year has been devoted by him to supplying the specimens placed on exhibition with written labels, and this important task is so nearly finished that but for the Columbian Exposition it would probably have been completed by this time. That part of the collections which is not on exhibition is still awaiting its definite arrangement and classification.

The material so far gathered is not especially available for use in special researches. A useful series of notes on Japanese wood-cutting and woodcut printing was received from Mr. Tokuno, the chief of the Japanese Government printing office, which has been edited by Mr. Koehler and printed in the Museum report for 1892. This publication, which is fully illustrated, is the first treatise on this most interesting subject, based on authentic information received from a competent native Japanese source; it has all the value of a treatise based on original research.

Some additional specimens have been placed on exhibition, which serve to complete or better the series previously arranged, but no new series have been begun, nor, indeed, will this be possible, so long as the means and the space at command are as limited as they are at present.

Although the accessions by gift include a number of interesting and instructive specimens, it is difficult to point out any of them as of special importance, with the exception, perhaps, of an impression of Adolph Menzel's celebrated original lithograph, *Christ among the Doctors*, presented to the Museum by Mr. J. W. Osborne, and a fine large photogravure reproduction of Stuart's portrait of Washington, known as the *Athenium head*, by Messrs. A. W. Elson & Co., of Boston. The thirty-three prints by Schongauer, Dürer, Goltzius, Rembrandt, Nanteuil, Wille, Bartolzzi, Walker, Mercenri, Gaillard, etc., which, together with a number of technical specimens, were bought for exhibition at the World's Columbian Exposition, at a cost of about \$1,100, will of course add valuable material to the collections.

The exhibit prepared by Mr. Koehler for Chicago, though of necessity small, was exceedingly choice and instructive.

An adequate presentation of the subject being out of the question, the attempt was made to show the beginnings of the more important processes used in the production of printable pictures, and to contrast these with the latest achievements of the same processes, in the hope that, by thus placing into juxtaposition the two ends of the line of development, the advances made would become apparent at a glance. The whole collection was therefore to be looked upon as a tableau illustrating the condition of the multiplying arts at or about the time of the discovery of America, and the condition of the same arts in the nineteenth century, with added specimens of the principal processes introduced in the four hundred years intervening between these periods.

With this end in view, sixteen large frames were filled with prints, each frame containing on an average about six prints, and arranged as follows: Frame 1 contained woodcuts of the fifteenth and sixteenth centuries, while in frame 2, alongside of it, were shown wood-engravings by American wood-engravers, produced within the ten or twelve years last past. A similar arrangement was carried out for line-engraving and etching, which filled, respectively, frames 3 and 4, and frames 5 and 6. The later processes, the origin or at least the general acceptance and development of which dates from the seventeenth and succeeding centuries, had to be treated even more summarily. Thus, frame 7 was devoted to mezzotinting; frame 8 to dry-pointing and aquatinting; frame 9 to the crayon manner and stippling; frame 10 to lithography, and frames 11 and 12 to the various photo-mechanical processes. Frames 13 to 16 constituted a special division, in which the attempt was made to give some idea of the history of color-printing.

The curator was far from satisfied with this display, as will be shown by the following extract from his annual report, and it is not at all to be wondered at, since the possibilities were so great and the resources were so small, compared with those of any similar collection in a European capital. I can say from personal observation, however, that the collection was greatly appreciated, and not only deserved but received much attention, as indeed a series of specimens so well selected and admirably arranged and labeled could not fail to do in any exhibition at home or abroad.

I can not well omit the curator's own somewhat low-spirited estimate of the value of his work for the Exposition, since his statement of the great needs and great opportunities in this connection may very possibly attract the attention of persons who may be interested in improving the present condition of affairs.

I must reiterate [writes Mr. Koehler] my remarks upon the necessity of more liberal appropriations for the section of graphic arts. The unfortunate consequences growing out of the present condition of things made themselves very seriously felt in connection with the World's Columbian Exposition, and I shall therefore beg leave to offer a few remarks on this subject.

Among the great achievements which make the fifteenth century one of the most important epochs in the history of the human race, the development of the repro-

ductive or multiplying arts is by no means the smallest. Like the art of printing books from movable type, these arts were the outcome of the individualistic and humanistic movement of the time, and like it they have been instrumental in disseminating knowledge and training the human mind in the modern way of looking at things—the modern “world conception”—not only by accompanying the printed word by printed pictures in books of instruction, but still more by scattering broadcast among the people in vast numbers veritable works of art, which ministered to the reawakened feeling for the beauty of nature, while they quickened at the same time the powers of observation. It is worth noting, moreover, how closely the dates of importance in the first period of the history of the arts in question cluster around the date of the discovery of America. The first book illustrated with copperplate engravings, the *Monte Sancto di Dio*, appeared at Florence in the year 1477; Martin Schongauer, the first truly great artist north of the Alps who was active as an engraver, died in the year 1491, or thereabouts; the *Nuremberg Chronicle*, celebrated for its many illustrations by Wolgemuth, Dürer's teacher, is dated 1493; Dürer's *Apocalypse*, the first great woodcut publication ever produced, appeared in the year 1498, and Andrea Mantegna, the first truly great engraver south of the Alps, died in the year 1506. It would have seemed fitting, therefore, that in the picture of the world's progress since the discovery of America, which the Columbian Exposition was to present to its visitors, the history of the multiplying arts should have been illustrated quite fully. The limitations of means and space, however, made such an illustration impossible, and the result was an exhibition which commanded no attention, and, indeed, hardly deserved any.

Small and inadequate as this exhibition was, its usefulness was still further crippled by the impossibility of having the descriptive pamphlet printed which had been prepared, and without which the fragmentary character of the collection must necessarily have proved puzzling, even to well-informed visitors.

As to the specimens shown, while they were all good, and some of them, indeed, very fine, there were nevertheless wanting quite a number of things which ought to have been included, but instead of which, from dire necessity, inferior examples were exhibited.

When an institution like the U. S. National Museum, the only institution of its kind under the care of the Government of the United States, attempts to illustrate the beginnings of line-engraving, of mezzotinting, of color-printing from metal plates, etc., it ought to be able to show the rarest and best things,—for instance, a specimen of the best of Schongauer's, instead of only a late impression from a Schongauer plate; a mezzotint by Von Siegen, instead of merely a Wallerant Vaillant; color-prints by Le Blon and Debucourt, instead of things of little importance by D'Agoty and Jaminet, and so on to the end of the list. It is aggravating to be compelled to appear before the assembled delegates of the civilized nations of the world with such a confession of poverty, more especially when it is universally known that the insufficiency of the efforts put forth is due, not to the poverty of the nation, but to the neglect of the representatives of the people, into whose hands has been given the welfare as well as the upholding of the reputation of the United States.

What the curator has said merits serious thought, for the collections are undoubtedly pitifully poor in comparison with those of other nations, and a national print collection ought to be maintained in Washington worthy of the nation. It has, however, never been provided for, and what there is of that kind has grown up in connection with quite another plan, which was to illustrate fully the technology

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\* This was due to the unfortunate system of printing concessions made by the Exposition authorities, placing all printing privileges in the hands of a single establishment.

of the graphic arts. That the effort in this direction has been very successful is certain. In confirmation of this statement I quote a few sentences from the official report of Prof. William Roose, chief of the chalcographical division in the German Government printing office, who visited Washington and the Museum in the course of his mission to the World's Fair:

This wonderful collection in the National Museum [writes Prof. Roose] illustrates the graphic arts from their beginnings to the developments of the present day. It forms the most remarkable and unique collection of its kind, and probably stands alone in the world. It is not a so-called collection of engravings or of the productions of the graphic arts in the generally accepted sense, for the emphasis is not placed here upon the artistic value of the specimens shown. The aim is rather to illustrate how the graphic arts developed in the course of time, and how they are practiced at present. All kinds of intaglio engravings, etchings, mezzotints, aquatint, wood-engraving from its earliest products to the latest newspaper cut, lithography in all its varieties, the latest photo-mechanical reproductions in copper, gelatine, zinc, brass, etc., are shown in many hundred specimens, in all stages of development, and arranged in chronological series, accompanied by detailed descriptions—partly on the walls, partly in table cases—together with the plates, stones, electrotypes, etc., needed for their elucidation. The purpose here is to exhibit the technical, and to show how man managed to make pictures multipliable, what means he has thought out and used with this aim in view, from the beginning down to our own day. An original, one-sided, genuinely American, but certainly also a practical and sensible idea.

#### THE MATERIA MEDICA COLLECTION.

The work of this section, which is now under the care of Medical Inspector C. H. White, U. S. Navy, has been confined to the preservation of the collection in its present form and in the preparation of such new specimens as were found desirable for exhibition. The collection is in excellent condition for study, and the exhibition series is admirably installed, the greater part of it being a most admirable display in the field of economic botany.

The collection is so complete that novel additions are few.

#### DEPARTMENT OF ETHNOLOGY.

The ethnological collections are at present understood to include all objects illustrating the history and activities of mankind, save those classed as prehistoric and those which are assigned to the Department of Arts and Industries. The division is somewhat arbitrary, and there are of necessity constant changes of material, as the needs of the exhibition series show them to be necessary.

The ethnological collections are particularly complete for North America, but as years go by, through exchange and gift, they are becoming fairly representative of the whole world. The North American collections are especially rich in respect to the Eskimo stock, the stocks of the Northwest coast, the Shoshonean tribes of the Great Interior Basin, the buffalo-hunting tribes of the stocks along the Plains

of the West, and those of the Pueblo region of the southwest, which have been so thoroughly explored by the Bureau of Ethnology under the direction of Maj. J. W. Powell.

Perhaps no portion of the Museum is so cramped by lack of space as this. The material already mounted and labeled for exhibition would fill five times the space which can now be assigned to it, and if installed in rooms of sufficient capacity, would form one of the most instructive and impressive ethnological collections in the world. At present, however, only a small portion of this treasure can be shown, and the result is far from satisfactory, since the effective display of such objects depends largely upon the manner in which they are arranged with reference to one another and to some great ruling concept, a result which can only be accomplished in halls of ample dimensions.

The curator of the ethnological collection, Prof. O. T. Mason, has for a number of years been bringing these vast materials under control, so that any object with its full history can be consulted without delay, a most ingenious system of storage, indexed by a card catalogue rendering the material available for the use of investigators. At the same time the material is at once ready for any new steps in the development of the exhibition series, and were space available, in a few weeks the entire collection could be placed before the public. If this could be once accomplished, the result, I am satisfied, would astonish those who are most familiar with the resources of the Museum in this field.

During the past year the entire time of the curator has been devoted to the World's Fair to the exclusion of any new Museum enterprises. The usual routine of receiving new material and caring for the general collection has gone on, but no new specimens have been put on exhibition in the Museum. The number of specimens received during the year was 5,094, and 3,161 entries were made in the departmental catalogue.

As has already been said, the participation of the Museum in expositions is a detriment to its scientific work. A certain compensation is found, however, in the opportunity to instruct the public by an exhibit systematically arranged and labeled, and in the increase to the collections.

In arranging for the ethnological and archaeological portion of the exhibit at the World's Columbian Exposition it was decided that the efforts of this Department should be combined with those of the Bureau of Ethnology, which is another branch of the Smithsonian Institution, and which has already been so closely connected with the Museum in its activities that it is impossible to separate the interests of the two. In developing the plans for the Exposition, many projects were discussed, and, but for the fact that a general ethnological display had been arranged for under the direct control of the World's Columbian Exposition, a more comprehensive anthropological collection would have been prepared. It being the first object, however, to avoid

rivalry and duplication, and to contribute so far as possible to the general success of the fair, the scope of the National Museum exhibit was limited to North America.

In order to bring into sharp comparison the concepts of race, speech, and activities among the American aborigines, it was proposed by Prof. Mason that a special exhibit of arts and industries by linguistic stocks should be the main feature, and that this should be founded on the great linguistic map of North America, just then published by the Director of the Bureau of Ethnology, as the crowning result of ethnological labors on our continent during fifty years.

The details of this plan are quoted in the words of Prof. Mason, in the discussion of the labors of the Department of Ethnology. In this connection the staff of the Museum and Bureau of Ethnology cooperated—Prof. Mason representing the Museum and Mr. H. W. Henshaw the Bureau of Ethnology. This cooperation was interrupted for several months by Mr. Henshaw's absence from the city, but a month before the opening of the exhibit Prof. W. H. Holmes was assigned by Maj. Powell to represent the interest of the Bureau of Ethnology, and by him most efficient services were rendered, not only in preparing illustrations of his own remarkable investigations, but in advising and directing the preparators in arranging groups of costumed figures, etc. In this work Mr. Frank H. Cushing, through his familiarity with the customs and arts of the Pueblo people, rendered also most valuable services. Mr. James Mooney also participated, and the group of Kiowa children, prepared under his direction, was among the most attractive of them all. But for his absence in the field, collecting material, he would have been able to devise others of similar excellence. Dr. W. J. Hoffman superintended the preparation of groups of Northern Indians.

As has been stated, the plan upon which the combined exhibitions of the Bureau of Ethnology and of the National Museum were arranged, was developed by Prof. Mason, who describes in the following words its principal characteristics:

The plan of setting up the products of aboriginal art in accordance with the linguistic chart just published by the Bureau of Ethnology was carried out so far as the material would admit. Some of the stocks have disappeared altogether, and it would be impossible to give a picture of their arts. Others are reduced to such small numbers, and they are living now under such enforced circumstances, that it would be of little use to attempt to reproduce their primitive mode of life.

There are certain great stocks and groups of stocks, however, that are yet to be found in respectable numbers, and they were formerly spread out over vast areas, which in themselves constitute culture-regions. The stocks selected for representation at the Exposition were those which had developed unique types of culture; for example, the Eskimo for the Arctic area; the Koloschan, Wakashan, Haeltzukan, and Salishan stocks dwelling in the archipelagos and on the mainland of the northwest coast of America; the Athapasean stock, dwelling in three extremely different culture areas, to wit: in northwest Canada and Alaska; in northern California, and in New Mexico and Arizona; the Algonkian stock, whose tribes once covered the entire region of northern and eastern North America, bounded on the south by southern Tennessee and on the west by the 117th meridian; the Iroquoian stock, sur-

rounding the Great Lakes; the Siouan stock, on the Missouri drainage; the Kiowan stock, forming an intrusion from unknown source into the buffalo region of the plains; the Shoshonean stock, covering the great interior basin and related to the Aztecs of Mexico; the tribes of California occupying the acorn and piñon and basket-making area; the Piman and Yuman stocks about the Colorado mouth; the Pueblo peoples in Arizona and New Mexico. These stocks enable the student to examine the relations that may exist between geography, ethnology, glossography, and technography. All technical and biological regions are covered by this arrangement, and all of the leading nationalities and tongues, and all of the characteristic Indian arts are also represented.

The result of this study is most interesting. In the supply of natural wants, the various tribes have yielded to regional or geographic forces. This is well shown, both in the plains of the great West and in the southern desert, and, indeed, throughout the continent, as appears in comparing Powell's map with Dr. Merriam's bio-geographic map, published by the Department of Agriculture. Along the eastern slopes of the Rocky Mountains were formerly to be found Algonkian, Siouan, Kiowan, and Shoshonean tribes. Their languages were radically different. Their tribal organizations, similar in plan, were still entirely unlike in their totemic systems. But the all absorbing occupation of buffalo hunting, combined with the limitations of vegetal and mineral material, determined the diet, the dress, the house, the tools, and the products of industry. That is, the materialistic activities were controlled by the environment.

Superadded to this series of effects, as anyone could see at the Exposition, were others of a more refined nature. The spiritualistic, metaphysical expressions in these same specimens were overwhelmingly ethnical and linguistic. The arrow for killing a buffalo must be of a certain material and form; nature determined that. But the feathering, the streaking, the symbolism on the arrow, were distinct for each tribe and tongue. The buffalo or bearskin robe was nature's gift to all, and it was cured after the same general fashion. But the paintings were national, totemic, special, almost independent of the environment.

The Pueblo region teaches some interesting lessons in these same particulars. Here are gathered also four stocks, the Shoshonean, the Tañoan, the Tewan, and the Zuñian, differing essentially in language and totemic system and mythology. But there are only certain articles of food to be had here naturally; the country lends itself kindly to the cultivation of corn, beans, and pumpkins. The peculiar geological formation, furnishing stone and adobe mud in abundance, almost forbade the erection of other than one style of house, the pueblo. Clay of the finest quality everywhere invited to the creation of pottery. As for textiles, the curious phenomenon is presented of tribes preserving their old arts in new areas. This remark may be supplemented by the observation that the bringing of sheep to this region by Spanish missionaries stimulated the trade of frame and loom weaving in all the linguistic stocks alike.

By the method of study pursued in this exhibit in Chicago, the lessons inculcated by other stocks are emphasized. For instance, while the Moki or Hopi Pueblos of northeastern Arizona are tenanted by Shoshonean tribes, the Utes, the Shoshones, the Bannacks, and even the Comanches, are of the same linguistic family. Now, in one of these is presented a buffalo-hunting people, in another an Indian of the woods, in a third the man of the desert, with corresponding occupations. The country has endowed and suggested the trades in each case. In one of the Hopi pueblos, furthermore, two styles of basketry are to be seen that are unknown among the other Shoshonean tribes. One of them, the coiled ware, resembled in technique, but not in material, that of the wild Apaches or the southern Californians. The other is a wicker type, really unknown among other tribes hereabout but common everywhere in North America east of the Mississippi. It is impossible to bring out all the minor lessons taught in this first attempt ever made to bring the concepts of



tribe, language, and industry into the same line of comparative study through series of objects.

The following is a concise description of the exhibits. The plan was to set apart a definite space or alcove for each linguistic family or stock, to place in the center of each a group of lay figures of men and women or children, dressed in proper costume and engaged in typical occupations. About this group, in wall cases and screens, would be assembled as many examples of the handiwork of that people as possible. Especial attention was given to selecting such arts as were quite characteristic and distinctive in each case.

It is much to be regretted that the contracted space allowed in the Government building at Chicago prevented the curator from giving to the idea its fullest expansion. Enough was displayed, however, to bring into prominence the statement that the earth, with its climate and natural resources, has much to say about the material and the form of human industries. Blood and language and social life and religion have their say also in the arts of life, but their influence is superadded, and not fundamental.

In the development of this collection, in accordance with these plans, Prof. Mason was engaged for nearly three years, and a large amount of effort, which under other circumstances would have appeared in the form of contributions to the literature of ethnology, was devoted to the preparation of the descriptive labels and the educational material to be exhibited. In this work most effective assistance was rendered by various members of the Bureau of Ethnology and the Museum staff. Mr. James Mooney spent several months among the Moqui Indians of Arizona, and Kiowas of Indian Territory, and while in the field was also instrumental in obtaining the Voth collection from the Cheyenne and Arapahoes. The collections sent in embraced over one thousand objects. Dr. W. J. Henshaw also collected among the Crow Indians, and obtained among other things some very beautiful costumes, especially the dress and outfit of a Crow warrior. Mr. Henshaw while in California obtained an important collection of basketry and other objects of the Californian tribes.

Another interesting and important outgrowth of the work of this department was the result of the curator's especial interest in the work of woman in savagery, or woman's share in primitive industry. This subject was discussed by him in the lecture entitled "Woman's Share in Primitive Culture," delivered by him in the National Museum Saturday lecture course in 1888. The attention of many intelligent women was thus attracted to the subject, and at the special invitation of the Board of Lady Managers, and in accordance with the special resolution of Congress, an exhibit of woman's industries was prepared and installed in the Woman's building. The idea which this collection was intended to illustrate is described as follows:

The motive of this exhibit was to show woman's work in savagery, or woman's share in primitive industries. Reviewing Mr. Spencer's division of the course of history into an age of militancy and an age of industrialism, it occurred to the curator that this should rather be a sexual classification. This would give a sex of militancy, which is masculine, and a sex of industrialism, which is feminine. This is very clearly proved by this exhibit. The highest classic concept would be

craft or trade—for example, the harvester, the miller, the cook, the tanner, the potter, the weaver, and so on. Under each of these heads, by a collection of specimens, it was shown what women from every savage area are capable of doing. The division was first technic and then ethnic. The whole title of the exhibit would read, "What women of savagery in each trade could do, and how these works appeared when compared ethnically."

Reference has already been made to the participation of the Smithsonian Institution in the Columbian Historical Exposition at Madrid, and to the fact that the larger portion of the material was lent from the National Museum.

As a matter of fact, most of the matter sent from the Museum was selected from the exhibits already prepared, mounted, and labeled for the World's Fair in Chicago, and but for the elaborate preparations which had already been made, it would have been impossible for the United States upon so short a notice to have made so creditable a showing upon this most important anniversary. It was a matter of much regret that the pressure of the preparation of the exhibit for Chicago was so great that Prof. Mason could not accompany the collection to Madrid, as it represented so much of his individual activity, especially since he had been identified from the beginning with the committee of organization, which was appointed by the Spanish minister in Washington, and which had already done much to excite public interest in this occasion. His assistant, Dr. Walter Hough, was attached to the American commission, and was charged with the installation of the material from this department, as well as with the preparation of the Spanish catalogue, an English translation of which will appear in the forthcoming report of the Madrid Exposition. This catalogue embodies the descriptive labels of a large portion of the collection which was sent to Chicago, and which will in time be utilized in the preparation of various memoirs illustrative of the Exposition material in the Museum.

Although allusion has been made to the Museum staff of preparators in connection with the Chicago exhibit, it seems only proper to refer here to the admirable work of those especially attached to the ethnological collections, notably Mr. Carl Bergman, in the mounting and costuming of groups of figures, and Mr. Thomas W. Sweeny in arranging and labeling the cases containing the comparative collections. Mr. Theodore A. Mills and Mr. Dunbar rendered excellent services in the modeling and casting of the bodies, heads, and limbs of the figures in groups.

All the activities of the department were so absorbed by the work which has just been described, that this and the preceding year's work upon papers and monographs upon the collection was to a large degree interrupted. A paper upon "The Ulu, or Woman's Knife of the Eskimo," by the curator, in the Report of the Smithsonian Institution, appeared during the year.\* This paper was prepared especially for

\* Report of the U. S. National Museum, 1890-'91, pp. 411-416, Pls. LI-LXXXII.

archæologists, to enable them to understand the functions of many stone implements in their cabinets.

An address was also delivered by him on "The Land Problem" before the Brooklyn Ethnological Society. During the year also appeared Mr. Hough's "Catalogue of the Bernadou, Allen, and Jony Korean Collections in the National Museum,"\* and also by the same student a paper on time-keeping by lighting and fire, and another upon the method of fire-making. Mr. J. D. McGuire's paper on the "Stone Hammer" was also written in connection with the Department of Ethnology and was prepared in the Museum. In this same connection should be mentioned the essay by Surg. Washington Matthews, U. S. Army, on the Catlin collection of Indian paintings in the National Museum.† Mr. McGuire also prepared a series of objects for the World's Fair to illustrate the processes employed by the North American Indian in working stone, by battering, boring, sawing, chipping, grinding, and polishing.

A series of these objects, together with the apparatus used, was displayed at the Exposition, and an exact account given of the time and method used in the preparation of each one on an accompanying label. The case containing this collection occupied a prominent aisle in the Smithsonian space, and attracted much attention, not only from Americans, but also from Europeans.

The most important accessions of American material have been, as usual, through the Bureau of Ethnology, including especially the valuable collection made in connection with the Exposition by Messrs. Henshaw, Mooney, and Dr. Hoffman. Mrs. M. M. Hazen deposited an exceedingly important collection of objects from the Sioux and Eskimo tribes, collected by her late husband, and from Lieut. W. E. Safford was obtained a most important collection of paintings of Peru by a native artist, as well as a large collection of dress and native material, including the very handsome feather costume, which is mounted upon the single figure of a Xivaro Indian. This was one of the most beautiful of the costumed figures shown in Chicago. The Museum obtained by purchase the ethnological collection procured by Lieut. Cook during his military services in the West; from Mr. Edward Palmer, a small collection from the Tarahumara Indians of Mexico, and from the heirs of Mr. J. Henry Turner, some interesting objects collected on the Upper Yukon, Alaska. Of special interest in this connection, was a wampum belt obtained from Mr. William Thompson, and said to belong to the great Shawnee chief, Tecumseh.

A small African collection was received from Mr. William Astor Chandler, the result of his explorations in the eastern part of the continent, and others were obtained for the National Museum at Loanda by Mr. Heli Chatelain, and by Mr. Carl Steckelman, from Mayumba.

\* Report of the U. S. National Museum, 1891, pp. 429-488, Pls. II-XXXII.

† Report of the U. S. National Museum, 1890, pp. 593-610, Pls. CXXX-CL.

Dr. W. L. Abbott, whose magnificent contributions to the Museum are referred to elsewhere, sent an important collection of objects from Bombay. Erhard Bissinger, esq., U. S. consul at Beirut, Syria, sent a collection of Syrian games of chance.

Hon. W. W. Rockhill, Third Assistant Secretary of State, has placed at the disposition of the Museum a large and exceedingly important collection illustrative of the arts and customs of Tibet, which was obtained by him in his two journeys in the interior, and which is to be the subject of an illustrated catalogue to be published in the present report of the Museum. At Hoihow, China, Dr. Julius Neumann continued his friendly cooperation by sending additional illustrations of the native arts of northern China.

Polynesian collections were sent by Romsevélle Wildman, esq., U. S. consul at Singapore, who made special collections under the direction of the Museum. Alexander R. Webb, esq., U. S. consul at Manila, sent by request a collection from the Philippines, including a very excellent series of games. Victor A. Jenny, esq., U. S. consular agent at Macassar, secured specimens illustrating the arts of New Guinea, while our old and valued correspondent, Prof. H. H. Giglioli, sent in exchange an important collection from the Andaman Islands, including over 100 objects.

#### PREHISTORIC ANTHROPOLOGY.

The hall containing this collection is the largest and most impressive in the Museum, and, owing to the extent and value of the material, chiefly in American archaeology, it is one of the most noteworthy features of the establishment. Since the death of Dr. Charles Ran in 1887, by whom the collection was organized and first arranged, it has been under the charge of Dr. Thomas Wilson, who has increased it by the deposit of his own cabinet of European material.

The number of specimens at the end of the year is reported by the curator at 140,182, 1,164 having been added during the month of June.

Under the administration of the present curator many changes have been made, especially in the fundamental plan of classification. The collection is at present arranged in two series. The general principles adopted apply more to prehistoric objects from the Old World and are those of foreign archaeologists. It has been deemed unwise by the curator to attempt any definite classification of the culture of antiquity in the United States more than to put it generally into the neolithic period.

1. A synoptical series, with reference to prehistoric man, assembling objects believed to have been employed during each given epoch of early civilization. These epochs are then arranged in series, beginning with the earliest forms and continuing down to historic times.

2. Geographical series, in which the greater portion of the collection is arranged with reference to political subdivisions. The objects from

the provinces of Canada, the various States of the United States, and the Latin Republics are brought together.

In this department, also, much of the energy of the year has been devoted to preparing collections for expositions. The curator was attached to the staff of the United States Commission at the Historical American Exposition at Madrid from August, 1892, until December, when he was unexpectedly called upon to return.

The exhibit prepared under his supervision for the World's Fair was shown also at Madrid, and is explained at length in the special paper to be included in the report of the American Commission. It is described in brief in the following statement from the pen of the author:

The exhibit of this department at Madrid comprised 2,500 prehistoric objects, which were displayed in 19 double slope-top cases in the main hall assigned to the United States. The exhibit at Chicago comprised 1,250 specimens, arranged in 7 flat-top cases in an alcove belonging to the space assigned to the U. S. National Museum. The general arrangement of objects in these two expositions was much the same; that is, it was both chronological and according to function. The implements and objects belonging to the earliest period showing human occupation were arranged in the first cases, and consisted principally of those belonging to that which is in England called the Alluvial or Drift Period; in France, the Chelléan Epoch of the Paleolithic Period. The various epochs of the Paleolithic Age were represented by implements from northern and southern England; from all parts of France; from Italy, Spain, and Portugal; from Egypt, by a loan display from Prof. H. W. Haynes, of Boston; and from Hindostan, Asia. There were casts of several prehistoric skulls from Europe—the Neanderthal, Olmo, Laugerie Basse and Engis.

Implements similar in form, style, and manufacture to those of the Paleolithic Age of European countries were shown as coming from the United States, which objects, if found in Europe, would be undoubtedly accepted as paleolithic. The investigations in this respect in the United States of America have not been so profound as in Europe, and anthropologists are not unanimous concerning the conclusions to be drawn therefrom. There were shown a fossil human thorax and a fossil human skull and thigh-bone, the two latter changed to limonite, all from Florida, found by Judge John G. Webb; a fossil pyrula shell, bearing the prehistoric engraving of a mammoth; implements from the auriferous gravels under Table Mountain, California; others from the Walker River Canyon, in the extinct Quarternary Lake Lahontan, Utah; still others from Fossil Lake, Oregon. These were followed by prehistoric objects of the Neolithic or Polished Stone Age, those from Europe having precedence. England, France, Spain, Italy, Switzerland, Germany, Denmark, Sweden, Norway, Russia, the Island of Crete, Japan, and Cambodia were all represented. The implements from these countries were much the same as those from the United States.

In the display made from the United States every State and Territory was represented by objects belonging to prehistoric man—polished stone hatchets, grooved axes and drilled axes, arranged in series according to form, style, and size; stone mauls, adzes, gouges, some from the West Indies of shell; extensive series of caches of leaf-shaped and other stone implements, principally from Pennsylvania and Ohio, though some were from Tennessee and Arkansas; a full series of implements from the quarries and workshops of Flint Ridge, Licking County, Ohio; scrapers of all kinds; arrow- and spear-heads arranged in the latest classification, leaf-shaped, triangular, and stemmed, and those of peculiar form; large flint disks: ceremonial

objects, ornaments and weapons. cup and pitted stones, drilled tablets, discoidal stones ("chungkee"), sinkers, pendants or charms; perforators; tubes, beads and pipes, shown as specimens of aboriginal drilling; club heads, digging sticks, riatas, mortars, and grinding stones; pestles; steatite vessels and the implements with which they were made; hematite objects; agricultural or digging implements, arranged in series; aboriginal sculptures; objects in shell, horn, and bone; stone daggers and swords; slate knives; copper implements from the United States; stone collars and zémés from Porto Rico; stone masks, clubs, and hatchets from the West Indies; jade, turquoise, rock crystal from Alaska, Mexico, Central and South America; obsidian from California and Mexico; gold objects and ornaments from Chiriqui and Antioquia, Central and South America; plaster models of aboriginal towns and monuments belonging to Indian tribes; and, for purposes of comparison, numerous objects from the modern North American Indians were shown in the glass case, duly labeled with the tribe, locality, and special point of comparison indicated.

The collection was arranged in groups, so that a single label would comprise as many objects as possible. The labels were prepared with care, printed on herbarium board, and displayed with the objects so as to be easily read by the public.

The collection was described in the official catalogue as follows:

The exhibit under this head deals with man before the dawn of history, and comprises implements, utensils, and other objects found in different parts of the world, and recognized as his handiwork.

#### OBJECTS OF THE PALEOLITHIC OR CHIPPED-STONE AGE.

A series of about sixty chipped stone objects from Europe, Asia, and Africa, belonging to the first, the alluvial or Chelleen Period of the Age, and representing the earliest accepted implements made by man.

Objects of the second, the Reindeer or Cavern Period.

Casts of four prehistoric human skulls Neanderthal, Olmo, Engis, and Laugerie Basse.

Implements of stone and bone from France and England (Cresswell and Kent's caverns, England; Moustier, Solutre, and La Madelaine, France).

Objects from the United States, of the same form as the preceding found in Post-pliocene formations and on the surface, and believed by some students to be implements of the same character as those of Europe. (Exhibited for comparison.)

#### OBJECTS OF THE NEOLITHIC OR POLISHED-STONE AGE.

A series from the Old and New worlds, comprising hammers, cores, flakes, hatchets, scrapers, disks, chisels, poignards, arrow- and spear-heads—polished and unpolished.

A collection to illustrate a classification of arrow- and spear-heads.

A series of objects of stone, including "banner stones," drilled tablets, and boat and bird shaped stones, etc., the uses of which are unknown, but which are supposed to have been connected with ceremonies, or used as ornaments or in games.

Objects of shell, bone, and horn.

Copper implements and ornaments of America.

Gold ornaments from Central and South America.

Bronze implements and ornaments from Europe.

A collection of ornaments, knives, hatchets, and other objects, of jade, turquoise, rock crystal and obsidian, from Alaska, Central and South America, Australia, and New Zealand.

A series of prehistoric Carib implements, including stone collars, zémés, stone masks, clubs, hatchets, etc., from Porto Rico, West Indies.

In connection with the Exposition work, Mrs. Wilson's private collection of laces, mounted, and with an elaborate series of descriptive labels, was placed in the Woman's building.

An interesting and valuable collection of prehistoric antiquities comprising 178 objects was given by Mrs. Schliemann on behalf of her husband, lately deceased. They were gathered by the celebrated explorer during his excavations on the hill of Hissarlik and came from the buried cities on the site of Ancient Troy.

The curator continued his duties as editor of the department of anthropology in the "American Naturalist" and also published a paper upon "Anthropology at the Paris Exposition in 1889." In addition to the routine work already described, the preparation of a series of casts of typical prehistoric stone implements for distribution to colleges and museums has been continued.

#### THE COLLECTION OF ORIENTAL ANTIQUITIES.

This collection is an outgrowth of the Department of Ethnology and was established in 1888 under the honorary curatorship of Dr. Paul Haupt, professor of Semitic studies in Johns Hopkins University, chiefly for the purpose of calling attention to the fact that the National Museum was ready to receive and care for objects obtained by archaeological exploring expeditions in the East, and also to meet the constant demand from visitors for collections corresponding to those known in London as of Biblical archaeology.

Owing in part to lack of space, the specimens have not been a very serviceable study collection. Special attention was given to the making up of a study series of casts of Assyrian and Babylonian seals, of which a large number were found to be in private possession of this country. It is hoped that in time this series will include a complete representation of every seal in America, and that this material of such importance for purposes of research will be elaborate enough to render it available for comparative study.

Owing in part to lack of space and still more to the fact that it is so difficult to obtain genuine material, the growth of this collection has been very slow, but it still occupies a prominent place in the Museum, and every effort will be made for its improvement.

A number of objects have recently been withdrawn from this series to form a portion of the collection of religious ceremonials which was prepared as a special feature for the World's Fair under the charge of Dr. Cyrus Adler, assistant curator of this department.

Among the most important recent accessions are two squeezes of ancient tablets at Persepolis, brought home by the Hon. Truxton Beale, from which have been made the beautiful plaster casts figured and described by Dr. Adler in another part of this report.

Another collection received during the year, which seems to deserve special remark in this place, is referred to in a statement prepared by the custodian of the collection:

The most notable and welcome collection was obtained through the kindness of Miss Olive Risley Seward, of Washington, who placed on deposit in the Museum an interesting collection of Cypriote and Phœnician objects. Aside from their intrinsic value these objects have a historical value, in that they were acquired at the actual scene of the excavation.

#### THE COLLECTION OF RELIGIOUS CEREMONIAL OBJECTS.

Since 1889, objects of religious ceremonial have been exhibited in connection with the collection of Oriental antiquities. A beginning was made by the formation of an exhibit to illustrate the Jewish religion, but the scope has since been widened and may in the future include the lower types of religion, with the exception perhaps of those which it would be difficult to illustrate by the separation of material from the general ethnological series.

The idea of a collection of this kind was first taken up in this country by the National Museum, and a proposal is made in regard to it in the Museum reports for 1881 and 1889.

In 1892 a similar project was taken up by the University of Pennsylvania, and an admirable loan exhibition was prepared under the direction of Mr. Stewart Culin.

In the "Biblical World" for January, 1893, the following allusion is made to the subject:

An important and indeed indispensable adjunct to the study of religions is the Museum, which in its ideal form should represent a tableau of the course taken by religious rites in their development. Credit is due to the U. S. National Museum for having taken the initiatory steps in this direction. In his report for 1889,\* the Secretary of the Smithsonian Institution called attention to the importance of collections of articles of worship, and since that time an excellent beginning has been made in the departments of American and Oriental antiquities. Messrs. Fewkes, Adler, and Rockhill have been instrumental in advancing the section of comparative religions in the National Museum and with the admirable facilities possessed by a Government institution for obtaining objects from all parts of the world, the scope of this section ought at an early day to be made coequal with the universe. At the University of Pennsylvania, also, the place of the Museum as the laboratory for study of religions was emphasized by a special loan exhibition of objects used in religious worship, which was opened last spring. The catalogue, which is of the entire exhibition, is due to the energetic and well-directed efforts of Mr. Stewart Culin, the director of the University museums, and is an admirable piece of work, distinguished for its method, clearness, and accuracy. The exhibition, embracing Egypt, India, China, Japan, America, and Mohammedanism, is noteworthy as the first of the kind in the country.

The history of the collection has been epitomized in a paper prepared by Dr. Adler for the Anthropological Congress in Chicago, a revision of which is printed in Part II of this Report.

The special exhibit shown in Chicago is limited to a selection from the religions of the nations inhabiting the Mediterranean basin, with special regard to the ceremonies, as forming the starting point for a comparative study of religions.

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\* The plan was first announced in the Report of the Assistant Secretary for 1881.



The exhibit comprises the following religions: Assyro-Babylonian, Jewish, Mohammedan, Greek, Roman, and Oriental Christian.

Assyro-Babylonian religion:

Bas-reliefs (casts) representing divinities and worshippers.

Seals (casts) engraved with representations of mythological and religious scenes.

Photographs of divinities and scenes of worship.

Jewish religion:

Objects used in the service of the Synagogue.

Sacred books: Manuscripts of the Law (Pentateuch), of the book of Esther.

Ornaments, veils and curtains of the Holy Ark, mantles and covers for the law; breastplates, bells, and pointers.

Outfit of the worshipper: Prayer-mantle, phylacteries, and prayer books.

Objects used on sacred occasions.

Sabbath: Kiddush cloth, habdalah set, lamps.

Passover: Complete set of the utensils of the passover meal, comprising glasses, dishes, cups, saucers, serviettes, and covers. The liturgy of passover evening.

New Year's day and day of atonement: Cornets (shofars). Liturgies of the Beni-Israel (Jews of Bombay in the Marathi language).

Feasts of tabernacles: Curtain of booth, palm branch (lulab), and citrou (ethrog).

Objects used on special occasions: Circumcision, knife and cup. Consecration of child. Siyum. Marriage: Wedding rings, marriage contracts. Omer tablet. Other religious observances. Knife used for slaughtering animals. Hanukah (feast of dedication)—lamps. Mezuzah—tablet on the door post. Amulets. Mizrach.

Graphic illustrations: Ceremonies and implements of the synagogue. Ceremonies of festal days. Domestic ceremonies. Photographs of synagogues. Photographs of Jewish rabbis. Photographs of Samaritan pentateuchs and other MSS.

Mohammedan religion:

Objects used in the mosque: Koran, reading stand, crescent, lamps, ewer and basin for ablutions. Dress and paraphernalia of religious persons. Costume of Imam and Dervish. Dervish staff and drum. Vessel, amulets. Set of photographs of Mecca and the pilgrims. Photographs of mosques, fountains, religious persons and feasts, and burial places.

Greek religion:

Objects of worship. Principal divinities. Minor or secondary deities. Mythological scenes. Religious practice. Festal scenes and processions. Altar and sacrifices. Votive tablets. Sepulchral reliefs. Graphic illustration: Picart plates representing divinities, priests, altars, and other utensils of worship and various religious scenes.

Roman religion:

Objects of worship. Principal divinities. Minor or secondary deities. Tombstone.

Oriental Christian religion:

Armenian, Coptic, Ethiopian, and Greek ceremonial vessels, votives, ikons, manuscripts, etc.

The idea of a collection of religious ceremonial objects has excited much interest, and cooperation most valuable and enthusiastic has been given by a number of the friends of the Museum.

## THE COLLECTION OF AMERICAN ABORIGINAL POTTERY.

This collection, a portion of which would seem to belong to that of prehistoric anthropology, has grown up under the direction of Prof. W. H. Holmes, of the Bureau of Ethnology, and in connection with his studies of American art in clay. It is arranged in one of the central courts of the Museum building by tribes and regions, including not only the magnificent series of Pueblo objects obtained by the Bureau of Ethnology, but also the general collection from the mounds of the Mississippi Valley and from the burial cemeteries of Central and South America, and forming one of the most impressive exhibitions of the kind ever brought together.

The series of vessels to represent the art of the Pueblo tribes was sent to the World's Fair. They were grouped and arranged with life-size figures representing Zuñi women making and decorating pottery, executed by Mr. F. H. Cushing. Mr. Holmes also prepared for the World's Fair illustrations of his other investigations upon the quarrying and stone industries of the Indians.

The collections shown in Chicago illustrate the quarrying of stone by the aborigines of the United States, for utensils, pipes, ornaments, etc.; the manufacture of stone implements from flint, chert, novaculite, quartzite, and rhyolite; and the mining of copper and mica.

Exhibit illustrating the ancient quarrying of quartzite boulders (and the manufacture of implements from them) on Piney Branch, District of Columbia; including a series of specimens, showing processes and progressive steps of manufacture; and photographs, drawings, and maps representing the site and nature of the aboriginal operations and the method of exploration.

A group of exhibits illustrating by means of specimens, maps, photographs, etc., the quarrying and manufacture of chert in Indian Territory, together with a mass of quarry refuse.

Exhibits representing the novaculite quarries of Garland County, Ark., including a series of hammer-stones.

Exhibits representing the flint quarries of Flint Ridge, Licking County, Ohio, and the manufacture of knives, spears, and arrow-heads.

An exhibit representing the quarrying and shaping of rhyolite by the ancient inhabitants of Pennsylvania.

Specimens illustrating the use of flint nodules in implement-making by tribes of Texas.

Specimens, photographs, and maps showing the aboriginal manufacture of soapstone utensils in the District of Columbia.

Collections from the ancient copper mines of Isle Royale, Lake Superior, supplemented by photographs, maps, and drawings.

An exhibit representing the sacred pipestone quarries of Southwestern Minnesota.

A collection representing ancient mica mining in North Carolina.

Costumed figures—two negro workmen engaged in breaking up and flaking flint.

The accessions of the year include a large number of entries, the most important being that of a series of ancient pueblo vases purchased from Mr. H. Hales, of New Jersey, to form a part of the department exhibit of aboriginal ceramics at the Columbian Exposition. Small collections, mostly shreds only, have been made by Mr. Gerard Fowke and Mr.

William Dinwiddie, of the Bureau of Ethnology in Virginia and Maryland, and Mr. C. Mindeleff and Mr. James Mooney, of the same Bureau have added to the collections of ancient and modern pueblo ware from Arizona. Donations have been received from Messrs. Thomas Downing, W. H. Phillips, W. L. Abbott, C. Steckelman, E. A. Mearns, Thomas Lee, S. L. Frey, J. A. Maxwell, P. L. Jouy, and Miss E. Mayer.

The important collection of ancient pueblo pottery made by Mr. Thomas Keam, of Arizona, which has for a number of years been exhibited as a loan, was purchased by Mrs. Mary Hemenway, of Boston.

#### DEPARTMENT OF MAMMALS.

Very little regular work was done in the department during the year, owing to the work for the Columbian Exposition, and the detail of Mr. True, the curator, for general executive work of the Museum.

In preparing plans of this exhibit two considerations were kept in mind: First, that the Exposition commemorated the discovery of America, and hence that the exhibit ought, as far as possible, to be American in character; and, secondly, that as the general display of the Museum was intended to furnish an indication of the different branches of its exhibition-work, it was desirable to show, as far as possible, the several classes of such work in which the department was regularly engaged.

It was first proposed that a prominent feature of the exhibit should be a complete series of mounted skins of North American mammals, including every species, and also every variety that had received a distinctive name. It was intended that this exhibit should be a complete representation of the mammal fauna of the country, and at the same time should show the character and quality of the taxidermic work done by the department. To bring into stronger relief certain of the characteristic mammals of America, it was proposed, in addition, to exhibit groups of specimens, with accessories indicating natural surroundings. It was thought that these groups would also add to the attractiveness of the exhibit, and bring into view another branch of the taxidermic work of the Museum.

At a later date, in order to enhance the interest of the exhibit, it was proposed to include a representation of some of the characteristic mammals of Central and South America, or possibly the genera complete.

Finally, however, when the details of the allotment of space in the Government building became known, the plan underwent considerable modification.

The complete representation of species of North American mammals was then abandoned in favor of a display of all the American families, by genera, as a part of a general series of American animals, arranged on the same plan. Thus the exhibit, as finally installed, consisted of—

1. A series of single mounted skins, representing the families of American mammals, by genera.

2. A series of groups of characteristic North American mammals, each confined to a single species, and consisting of several specimens (adult males and females, and young of both sexes, in most instances), accompanied by accessories, indicating the surroundings and habits of the species in a state of nature.

It is unnecessary in this connection to give a detailed list of the genera included in the family series, as, with no great number of exceptions, the entire mammalian fauna of America was represented in this way. Only the North American genera of bats were included, as these mammals are, for the most part, small, and do not present salient external characters. They would hardly repay, in connection with an exposition, the time and labor which it would be necessary to bestow upon them. The Cetaceans were omitted, as not belonging strictly to the American fauna.

Among the rarer genera exhibited were *Chironectes*, *Chlamyphorus*, *Xenurus*, *Elasmognathus*, *Lagidium*, *Microdipodops*, *Solenodon*, and *Brachyurus* (or *Ouakaria*).

Of some of the rarest families, such as *Dinomyida*, no representatives could be obtained. Pictures of some of these were introduced.

A large proportion of the specimens included in this systematic family series were taken out of the Museum cases, but it was necessary to purchase a considerable number to fill gaps.

The families shown are as follows:

<i>Cebida</i> , the American Monkeys.	<i>Soricida</i> , the Shrews.
<i>Hapalida</i> , the Marmosets.	<i>Centetida</i> , the Tenrecs and Almqis.
<i>Felida</i> , the Cats.	<i>Sciurida</i> , the Squirrels.
<i>Canida</i> , the Dogs.	<i>Haplodontida</i> , the Sewellels.
<i>Mustelida</i> , the Weasels.	<i>Castorida</i> , the Beavers.
<i>Ursida</i> , the Bears.	<i>Murida</i> , the Rats and Mice.
<i>Procyonida</i> , the Raccoons.	<i>Geomysida</i> , the Pouched Gophers.
<i>Cercopithecida</i> , the Kinkajous.	<i>Saccomysida</i> , the Pouched Rats.
<i>Otariida</i> , the Sea-Lions.	<i>Dipodida</i> , the Jumping Mice and Jerboas.
<i>Phocida</i> , the Seals.	<i>Octodontida</i> , the Spiny Rats.
<i>Odobenida</i> , the Walruses.	<i>Hystrioida</i> , the Porcupines.
<i>Camelida</i> , the Camels and Llamas.	<i>Chinchillida</i> , the Chinchillas.
<i>Borida</i> , the Cattle.	<i>Dasyproctida</i> , the Agoutis.
<i>Antilocaprida</i> , the Prong-horn Antelopes.	<i>Dinomyida</i> (no English name; only one specimen known).
<i>Cervida</i> , the Deer.	<i>Caviida</i> , the Cavies.
<i>Dicotylida</i> , the Peccaries.	<i>Lagomyida</i> , the Pikas.
<i>Tapirida</i> , the Tapirs.	<i>Leporida</i> , the Hares.
<i>Trichechida</i> , the Manatees.	<i>Myrmecophagida</i> , the Ant-eaters.
<i>Phyllostomida</i> , the Leaf-nosed Bats.	<i>Bradypodida</i> , the Sloths.
<i>Emballonurida</i> , the Free-tailed Bats.	<i>Dasypodida</i> , the Armadillos.
<i>Vespertilionida</i> , the Typical Bats.	<i>Didelphida</i> , the Opossums.
<i>Talpida</i> , the Moles.	

The groups shown were as follows:

A male Pacific Walrus, from Walrus Island, Bering Sea.

A group of California Sea-lions from the coast of California.

Steller's Sea-lions, male and female, from the Pribilof Islands, Alaska.

- A Sea-otter from Sannak Island, Alaska.
- A family of Badgers from Kansas, with plants and ground-work, representing the natural surroundings of these animals on the plains.
- A group of three Woodland Caribou, from Newfoundland, with accessories representing the more open portions of that island.
- A group of Barren-ground Caribou from Alaska, on the "tundras," or treeless plains.
- A group of four Rocky Mountain Goats, from Montana and British Columbia, represented as standing on a ledge of a rocky mountain side.
- A group of six Rocky Mountain Sheep, from Wyoming and Montana, represented as climbing about a mountain peak, near the snow-line.
- A group of nine-banded Armadillos, from Texas, with accessories showing the prickly vegetation of the arid regions.
- A family of Virginia Opossums, showing nest and young.
- Virginia Deer. A scene at the margin of a water-course in Virginia. A group, comprising two bucks, a doe, and a fawn, with accessories, consisting of trees and plants characteristic of Virginia, intended to convey an idea of the surroundings in which the Virginia deer was first seen by the European colonists.

Active work in installation was begun in May, 1891, when the curator visited the establishments of the larger dealers in natural history supplies, and obtained such materials and specimens as were needed to begin the work. The force of taxidermists was increased from three to nine, and divided into two parties, one of which worked on the groups and the other on the single specimens intended for the systematic series. Mr. William Palmer was appointed chief taxidermist, and had immediate charge of the work under the general supervision of the curator; by whose judgment and artistic taste the effectiveness of the groups was greatly enhanced.

In preparing the groups every effort was made to produce an artistic effect, not less than to secure complete fidelity to nature, and sound and finished workmanship. Every one employed contributed his share of special skill and knowledge, and advantage was taken, as far as possible, of advice given by competent field naturalists.

Photographs of living animals and of characteristic scenery were utilized when available. Special acknowledgment should be made to Mr. George Bird Grinnell, of New York, for advice and assistance in connection with the group of Mountain Goats; to Col. Cecil Clay, of Washington, and to Rev. M. Harvey, of Halifax, in connection with that of the Woodland Caribou. Mr. J. Stanley Brown obtained large quantities of lichens and mosses in Alaska for the group of Barren-ground Caribou.

A new feature in these groups was the introduction of natural leaves, grasses, plants, and sea weeds, prepared by a process invented and satisfactorily carried out by Mr. William Palmer. Vines with leaves and tendrils which had never been detached from the natural stalk, and other similar accessories, were used, producing effects which could not be obtained by artificial leaves fastened on artificial stems.

The production of these groups is attended with many difficulties, and the number which can be constructed in a given time would be

disappointing to one unfamiliar with the conditions. It is often very difficult to obtain the skins of animals of the proper ages, or of both sexes. On account of the great geographical variation of American mammals, the specimens for any one group must be from a single locality. The obtaining of accessories—plants, characteristic rocks, soil, turf, etc.—is often difficult. Photographs of living specimens for the guidance of the taxidermists are not always accessible, and, furthermore, in many cases there is much diversity of opinion regarding habits. All these circumstances, together with the mechanical difficulties involved, cause the groups to be expensive both of time and labor.

While the taxidermic work was progressing, attention was given to the preparation of labels. Those for the groups were descriptive, and were in several instances accompanied by small maps on which the geographical distribution of the species was indicated. The single specimens in the systematic series were provided with labels throughout, giving names, localities, etc., and, in addition, a larger label was made for each family, in which a brief summary of the characters, distribution, and habits of the group was presented. All these labels were uniform with those regularly used in the Museum, and were printed at the Government Printing Office.

Mention has been made of the series of domesticated animals, in the preparation of which this department gave some assistance. The series, so far as mammals were concerned, was not so successful as was desired, but some forms little known in the United States were, nevertheless, exhibited. As examples, may be mentioned the yak, obtained in India for the Museum by the late Dr. J. Wood-Mason; the zebu of India, the domestic buffalo of Africa, and the paca of South America.

As ornaments to the general zoological exhibit a number of mounted heads of the large game of the world were displayed. The following species are represented:

Eland, African.	Clark's Gazelle, African.
Greater Koodoo, African.	Waller's Gazelle, African.
Lesser Koodoo, African.	Doreas Gazelle, African.
Argali, or wild sheep of Thibet, Asiatic.	Sömmering's Gazelle, African.
Burhel, or blue wild sheep, Asiatic.	Speke's Gazelle, African.
Thar, or Himalayan wild goat, Asiatic.	Salt's Gazelle, African.
Asiatic Ibex, Asiatic.	Sassaby, or Hartbeest, Africa.
Beisa Antelope, African.	Jackson's Hartbeest, African.
Nylghau, Asiatic.	Siberian Boar, Asiatic.

While the arrangement of the exhibit was, on the whole, effective, the necessity of crowding the cases together detracted considerably from its appearance.

The curator has prepared the following statement of the events of the year:

The accessions are, many of them, of a very interesting character. The Museum is especially indebted to Dr. W. L. Abbott, for a collection from Aldabra, the Seychelles, and other islands of the Indian Ocean, in which are included three

skeletons and two skulls of the genus *Prodelphinus*, accompanied by notes on the external coloration, which will doubtless throw light on the identity of the species of this genus of dolphins. The collection also includes several specimens of Fruit-bats, *Pteropus*, including some which appear to represent an undescribed species. Mr. William Astor Chanler deposited a collection of about 35 mounted heads of African antelopes. An excellent series of 31 skins of the large game of South Africa, including the true zebra, hartebeestes, gnus, and other antelopes, lions, hyenas, wart-hogs, etc., were presented by Mr. H. C. Moore. Dr. P. L. Selater, secretary of the Zoological Society of London, presented a number of pelts of antelopes, and other East African mammals, collected in Berbera, Somali, by Capt. Swayne. Mounted specimens of *Anomalurus*, *Smutsia*, *Galeopithecus*, and *Bathyrgus* were purchased to fill gaps in the exhibition series. A number of small mammals of Burmah, from the collection of L. Fea, were also purchased. Skins of Brown's Kangaroo, the Spotted Cuscus, and the Papuan wild hog, characteristic mammals of New Guinea, were obtained from Bruno Geisler.

Dr. E. A. Mearns, U. S. Army, continued his extensive collection of mammals from the Mexican boundary. Mr. P. L. Jony made a collection in Mexico, and Prof. B. W. Evermann in South Dakota. Mr. C. H. Townsend, of the U. S. Fish Commission, obtained a Californian Sea lion (in San Luis Bay, Lower California), three Sea elephants, and a Steller's Sea lion. Prof. C. H. Gilbert obtained for the Museum, near Monterey, Cal., a fetal specimen of the rare Stearn's grampus, *Grampus stearnsi*. Forty-four mammals were received from the Zoological Park, including 4 bears, 2 Venezuelan deer, 3 llamas, a beaver, and several monkeys. A fine skeleton and a skull of the extinct Artic Sea cow, *Rhytina*, were purchased through the U. S. Fish Commission. The commission also obtained a skull of a Walrus. A skeleton of the Rocky Mountain Goat was purchased.

As already stated, few changes were made in the exhibition hall during the year. The collections presented a more or less chaotic appearance, owing to the necessity of withdrawing specimens for the Columbian Exposition.

The regular routine work of the department was carried on as usual. The skulls and skins deposited by the Department of Agriculture were entered; the work of cleaning skulls belonging to these collections progressed continuously, and 122 skins were made up, including 15 deer, 27 fur-seals, and other larger forms.

The system of cataloging the skin and skull of the same individual under different numbers, which had been in operation since 1852, has been abandoned so far as the collections deposited by the Department of Agriculture were concerned, and all specimens derived from a single individual, whatever their character, now receive the same number. The same system will be applied to the regular series as soon as the present volume of the catalogue is closed. The first number of the new series is 50,001. The old plan, which was satisfactory while the collection was small, had become very burdensome, and was furthermore constantly producing confusion in numbers.

A space in the upper part of the south-entrance laboratory was made available for storage purposes by the construction of a gallery, or second floor, at the south end of the room.

As soon as they were relieved of work for the World's Fair, the taxidermists proceeded to overhaul the skins which had accumulated in the vats for the previous two years, and also early accessions. It was found that many had deteriorated more or less for lack of attention, and a few were entirely ruined. As many as possible were dried for the study series and others were laid aside to be mounted at the earliest opportunity. This work was still in progress at the close of the year. The mounting of two antelopes, a gnu, and a hartebeest was begun. During the year 82 dry skins were made up for the study series of the Museum, and, as already stated, 122 skins belonging to the Department of Agriculture deposit.

Dr. E. A. Mearns, U. S. Army, with the aid of an assistant, continued for some

months to make collections for the Museum on the Mexican boundary. Mr. P. L. Jouy was also engaged in field work in Mexico for a part of the year.

The specimens lent for study, dissection, or other purposes during the year were as follows:

To Dr. J. A. Allen, American Museum of Natural History, New York, 9 skins and 10 skulls of Field mice (*Sitomys*); 24 skins and 15 skulls of Pouched Gophers (*Thomomys*); 1 skin and 1 skull of Meadow mouse (*Arvicola*); 1 skin and 1 skull of Field mouse (*Sitomys*); 1 skin and 3 skulls of Harvest mice (*Ochetodon*). For study.

To Dr. Harrison Allen, Philadelphia, Pa., 3 skulls of bats (*Dasypterus*). For study.

To Prof. Dr. Wilh. Leche, Stockholm, Sweden, 2 young Star-nosed moles in alcohol; 2 young moles in alcohol. For dissection.

To the Madrid Historical Exhibition, Madrid, Spain, 10 mounted mammals characteristic of the North American fauna; 7 pairs of antlers. For exhibition.

To S. N. Rhoads, Philadelphia, Pa., 2 skins and 1 skull of Cooper's mouse (*Sympatomys*). For study.

The number of specimens in the several series, June 30, 1893, was as follows:

Mounted skins in the exhibition series.....	842
Skins and alcoholic specimens in the study and reserve series.....	10,204
Skins and alcoholic specimens received during the year*.....	728

The last entries in the several catalogues, June 30, 1893, were as follows:

Regular series—

Catalogue of skins and alcoholics.....	20,994
Catalogue of skulls and skeletons.....	36,052

Department of Agriculture deposit:

Old series—

Catalogue of skins and alcoholics.....	36,939
Catalogue of skulls and skeletons.....	49,328

New series—

General catalogue (beginning with 50001).....	54,102
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#### DEPARTMENT OF BIRDS.

The year's work consisted chiefly in preparing the exhibit of birds for the Columbian Exposition. This work, owing to the impossibility of securing an adequate number of skilled taxidermists, and extreme difficulty of obtaining necessary materials and specimens, and the elaborate character of the labels prepared, absorbed all the time of the curator and his assistants and stopped the regular operations of the department.

More than 1,300 birds mounted on pedestals, representing nearly 900 species, were sent to Chicago; but owing to a reduction of exhibition space many of these had to be repacked and stored. This collection of mounted birds contained representatives of every one of the families of birds found in the Western Hemisphere (104 in number), except the American ostrich family, which was represented by water-color pictures. Among the smaller birds, each family was represented by sufficient number of species (mostly of different genera) to show the extreme variations of size, form, and coloration.

\* These statistics do not include the collections deposited by the Department of Agriculture, which are not directly in the custody of the curator. Forty-six specimens were received on deposit from other sources.



## BIRDS.

The systematic series, showing representatives of all the families of birds occurring in America, was arranged as follows :

- |  |  |
|--|--|
| <i>Fringillida</i> , the Finches.                      | <i>Falconida</i> , Falcons.                  |
| <i>Icterida</i> , the Hangnests.                       | <i>Columbida</i> , Pigeons or Doves.         |
| <i>Sturnida</i> , the Starlings.                       | <i>Cracida</i> , Curassows.                  |
| <i>Corvida</i> , the Crows and Jays.                   | <i>Perdicida</i> , Partridges and Quails.    |
| <i>Mniotiltida</i> , Wood Warblers.                    | <i>Tetraonida</i> , Grouse.                  |
| <i>Cercbida</i> , Honey Creepers.                      | <i>Meleagrida</i> , Turkeys.                 |
| <i>Tanagrida</i> , Tanagers.                           | <i>Opisthocomida</i> , Hoatzins.             |
| <i>Hirundinida</i> , Swallows.                         | <i>Cathartida</i> , American Vultures.       |
| <i>Vireonida</i> , Vireos.                             | <i>Phaethontida</i> , Tropic Birds.          |
| <i>Laniida</i> , Shrikes.                              | <i>Fregatida</i> , Man-o'-War Birds.         |
| <i>Dalida</i> , Palm Chats.                            | <i>Anhingida</i> , Anhingas.                 |
| <i>Ptiliogonatida</i> , Silky Flycatchers.             | <i>Phalacrocoracida</i> , Cormorants.        |
| <i>Ampelida</i> , Wax-wings.                           | <i>Sulida</i> , Gannets.                     |
| <i>Cinclida</i> , Dippers.                             | <i>Pelecanida</i> , Pelicans.                |
| <i>Troglodytida</i> , Wrens.                           | <i>Ardeida</i> , Herons.                     |
| <i>Certhiida</i> , Creepers.                           | <i>Cochleariida</i> , Boatbills.             |
| <i>Sittida</i> , Nuthatches.                           | <i>Ciconiida</i> , Storks.                   |
| <i>Parida</i> , Titmice.                               | <i>Plataleida</i> , Spoonbills.              |
| <i>Chamaida</i> , Wren-Tits.                           | <i>Ibida</i> , Ibises.                       |
| <i>Sylviida</i> , Warblers.                            | <i>Phaenicopterida</i> , Flamingoes.         |
| <i>Mimida</i> , Mocking Thrushes.                      | <i>Anatida</i> , Ducks, Geese, and Swans.    |
| <i>Turdida</i> , Thrushes.                             | <i>Anhimida</i> , Screamers.                 |
| <i>Motacillida</i> , Wagtails and Pipits               | <i>Rallida</i> , Rails.                      |
| <i>Alaudida</i> , Larks.                               | <i>Aramida</i> , Conrains.                   |
| <i>Oxyrhamphida</i> , Sharp-bills.                     | <i>Gruida</i> , Cranes.                      |
| <i>Furnariida</i> , Oven Birds.                        | <i>Psophiida</i> , Trumpeters.               |
| <i>Dendrocolaptida</i> , Wood-hewers.                  | <i>Cariamida</i> , Cariamas.                 |
| <i>Formicariida</i> , Ant Birds.                       | <i>Eurypygidia</i> , Sun Bitterns.           |
| <i>Pteroptochida</i> , Tapacolas.                      | <i>Edicnemida</i> , Thick-knees.             |
| <i>Conopophagida</i> , Ant-Pipits.                     | <i>Recurvirostrida</i> , Avocets and Stilts. |
| <i>Phytotomida</i> , Plantcutters.                     | <i>Phalaropodida</i> , Phalaropes.           |
| <i>Cotingida</i> , Cotingas.                           | <i>Scolopacida</i> , Snipes.                 |
| <i>Piprida</i> , Manakins.                             | <i>Jaçanida</i> , Jaçanas.                   |
| <i>Tyrannida</i> , Tyrant Flycatchers.                 | <i>Hæmatopodida</i> , Oyster-catchers.       |
| <i>Trochilida</i> , Humming Birds.                     | <i>Aphriziida</i> , Turnstones.              |
| <i>Micropodida</i> , Swifts.                           | <i>Charadriida</i> , Plovers.                |
| <i>Trogonida</i> , Trogons.                            | <i>Thinocoriida</i> , Partridge-plovers.     |
| <i>Picida</i> , Woodpeckers.                           | <i>Chionida</i> , Sheath-bills.              |
| <i>Capitonida</i> , Barbets.                           | <i>Pelecanoidida</i> , Diving Petrels.       |
| <i>Rhamphastida</i> , Toucans.                         | <i>Procellariida</i> , Petrels.              |
| <i>Galbulida</i> , Jacamars.                           | <i>Diomedida</i> , Albatrosses.              |
| <i>Bucconida</i> , Puff Birds.                         | <i>Larida</i> , Gulls and Terns.             |
| <i>Alcedinida</i> , Kingfishers.                       | <i>Rynchopida</i> , Skimmers                 |
| <i>Momotida</i> , Motmots.                             | <i>Stercorariida</i> , Skuas.                |
| <i>Todida</i> , Todies.                                | <i>Alcida</i> , Auks.                        |
| <i>Caprimulgida</i> , Goatsuckers.                     | <i>Urinatorida</i> , Loons.                  |
| <i>Steatornithida</i> , Oil Birds.                     | <i>Heliornithida</i> , Sun Grebes.           |
| <i>Cuculida</i> , Cuckoos.                             | <i>Columbida</i> , Grebes.                   |
| <i>Psittacida</i> , Parrots.                           | <i>Spheniscida</i> , Penguins.               |
| <i>Bubonida</i> , Owls.                                | <i>Tinamida</i> , Tinamous.                  |
| <i>Strigida</i> , Barn Owls.                           | <i>Rhida</i> , Rheas.                        |
| <i>Pandionida</i> , Ospreys.                           |  |
| <i>Buteonida</i> , Hawks, Kites, Eagles, and Vultures. |  |

Besides the synoptical collection there were shown the following special collections:

A Collection of Humming Birds comprising species of sixty-four genera.

A Collection of Birds of Paradise, embracing the following species:

<i>Astrapia nigra</i> , Incomparable Bird of Paradise.	<i>Paradisæa sanguinea</i> , Red Bird of Paradise.
<i>Chlamydera maculata</i> , Spotted Bower Bird.	<i>Parotia sefilata</i> , Six-wired Bird of Paradise.
<i>Chlamydera nuchalis</i> , Greater Bower Bird.	<i>Phonygama Gouldi</i> , Gould's Bird of Paradise.
<i>Cicinnurus regius</i> , King Bird of Paradise.	<i>Ptilonorhynchus violaceus</i> , Satin Bower Bird.
<i>Diphyllodes magnifica</i> , Magnificent Bird of Paradise.	<i>Ptilorhis Alberti</i> , Prince Albert's Rifle Bird.
<i>Drepanornis Albertisi</i> , D'Albertis's Bird of Paradise.	<i>Ptilorhis magnifica</i> , Magnificent Rifle Bird.
<i>Epimachus speciosus</i> , Grand Promerops.	<i>Ptilorhis paradisæa</i> , Rifle Bird.
<i>Lophorina superba</i> , Superb Bird of Paradise.	<i>Schlegelia Wilsoni</i> , Wilson's Bird of Paradise.
<i>Manucodia atra</i> , Black Bird of Paradise.	<i>Seleucides nigra</i> , Twelve-wired Bird of Paradise.
<i>Paradigalla carunculata</i> , Wattled Bird of Paradise.	<i>Semioptera Wallacei</i> , Wallace's Standard Wing.
<i>Paradisæa apoda</i> , Greater Bird of Paradise.	<i>Sericulus melinus</i> , Regent Bird.
<i>Paradisæa Augusta-Victoriæ</i> , Empress Augusta Victoria's Bird of Paradise.	<i>Xanthomelus ardens</i> , Fiery Bird of Paradise.
<i>Paradisæa minor</i> , Lesser Bird of Paradise.	
<i>Paradisæa Raggiæana</i> , Raggi's Bird of Paradise.	

A collection of Game Birds, including representatives of the following families:

<i>Anatida</i> , Ducks, Geese, and Swans.	<i>Otidida</i> , Bustards.
<i>Charadriida</i> , Plovers.	<i>Perdida</i> , Partridges and Quails.
<i>Columbida</i> , Pigeons or Doves.	<i>Phasianida</i> , Pheasants.
<i>Crucida</i> , Cnassows.	<i>Rallida</i> , Rails.
<i>Gourida</i> , Crowned Pigeons.	<i>Scolopacida</i> , Snipe.
<i>Megapodida</i> , Mound Fowls.	<i>Tetraonida</i> , Grouse.
<i>Melagrida</i> , Turkeys.	<i>Tinamida</i> , Tinamous.
<i>Numidida</i> , Guinea Fowls.	

A collection illustrating the confusion caused by the application of the same popular name to different species of birds. The following birds are represented: Bee Bird, Buzzard, Chimney Swallow, Goldfinch, Jacksnipe, Martin, Ortolan, Pheasant, Redstart, Robin, Screech Owl, Tree Sparrow, Woodcock, Blackbird, Carrion Crow, Coot, Jackdaw, Kingfisher, Oriole, Partridge, Quail, Redwing, Rook, Sparrow Hawk, Turtle Dove, Yellow-hammer.

Special groups, with natural accessories, as follows:

North American species approaching extinction: Carolina Paroquet, Ivory-billed Woodpecker, Passenger Pigeon.

To illustrate protective coloration: Ptarmigans in summer, Ptarmigans in winter.

To illustrate remarkable habits: Swallow-tailed Kite feeding, Carolina Paroquets roosting, California Woodpeckers and their storehouse, Jaçanas walking on lily-pads, Prairie Chickens courting, Flamingoes and their nests, Bower Birds and their playhouse, Crocodile Birds and crocodile, Lyre Birds and dancing mound of the male, Butcher Birds and their lair.

English Song Thrushes and their nest: An artistic group, presented by the artists, Mr. H. Minturn and Mrs. Mogridge, though the birds were mounted by the Museum taxidermist, Mr. H. C. Denslow.

The value of the entire exhibit, as an educational feature, is greatly

enhanced by the careful and explicit labeling, in popular language, of every object contained in it.

The gifts of material in this department have been so numerous and valuable that it is not practicable to mention in this place even by name all the contributors. They are enumerated in the list of accessions in Appendix VI.

Among the collections containing more than fifty specimens may be mentioned those of Dr. W. L. Abbott, from Kashmir and Baltistan; of Dr. W. L. Abbott, from the mountains and vale of Kashmir; of P. L. Jouy, from Jalisco, Mexico; of Dr. E. A. Mearns, U. S. Army, from northern Mexico, and the adjacent parts of New Mexico, Texas, and Arizona, including 823 skins; of Lieut. Wirt Robinson, U. S. Army, from Colombia and Curaçao.

Mr. Ridgway reports as follows upon the state of the collection:

The present state of the collection is very satisfactory as regards preservation, but quite otherwise so far as the arrangement of the skin collection of the larger birds, stored chiefly in the west basement, is concerned. This is due to causes almost beyond control, the chief of which is the congested state of the collection, which has far outgrown the space available for storage. The difficulty is, moreover, constantly increasing. To remedy the trouble considerable progress has, however, been made in rearrangement; but the space is so much overcrowded with cases that work can only be done slowly and at great disadvantage. At least five times the space now occupied by the collection would be necessary for its proper arrangement, without consideration of future accessions.

It has long been intended to make an extensive distribution of duplicate specimens, both to relieve the congestion of our storage facilities and to advance the study of ornithology in the various institutions of learning throughout the country; but this has been delayed until the entire collection can be rearranged, since the two being simply different parts of the same undertaking, are necessarily carried on together.

The total number of specimens was, at the end of June, 1893, substantially as follows:

Total skin series at end of June, 1892.....	60,532
Additions during 1892-'93 *.....	1,985
Total skins at end of June, 1893.....	62,517
Exhibition collection at end of June, 1893.....	8,154
Total specimens at end of June, 1893.....	70,671
Total specimens at end of June, 1892.....	68,416
Increase during 1892-'93.....	2,255
The last entry at end of June, 1892, is 126,361.	
The last entry at end of June, 1893, is 128,852.	

Specimens were sent for study to the American Museum of Natural History, to Osbert Salvin, esq., and Count Salvadori, London; to Gordon Trumbull, of Hartford; Witmer Stone, of Philadelphia, and other specialists.

#### DEPARTMENT OF BIRDS' EGGS.

The collection of birds' eggs still remains in the charge of Maj. C. E. Bendire, U. S. Army, retired, who, since the gift of his own unsur-

\* Less additions to mounted collection (370 in number) and specimens distributed (136).

passed private collection to the Smithsonian Institution in 1884, has devoted his entire time to the development of the national collection and the preparation of the treatise upon the eggs and nesting habits of North American birds, for which the Institution has been collecting material for nearly fifty years.

Maj. Bendire has continued the preparation of his work on the Life Histories of North American Birds, and the text for another volume, which will include the Cuckoos, the Woodpeckers, the Goat-suckers and Swifts, the Humming Birds, the Flycatchers, the Horned Larks, the Crows, Jays, Magpies, Blackbirds, and Orioles, is well in progress, and the illustrations are being prepared under his direction by Mr. John L. Ridgway.

The first volume of this work has been received with much favor, and it is gratifying that American work in illustration should receive such hearty commendation from European authorities as have the colored plates accompanying this Bulletin.

Dr. Blasius, in the "Rundschau," February 4, 1893, says:

The chromolithographs are perfect. The shading is so perfect, especially near the outlines of the eggs, which appear to be resting upon a light-gray surface, that one imagines himself to be looking at the original eggs. I am not acquainted with any work in English, German, or any other language, that has presented pictures of eggs approaching these in execution. One can not but express the highest regard for a scientific establishment like the Smithsonian Institution which produces so excellently executed a book, and we can but wish and hope that the entire work may be completed, so that we may have as comprehensive a treatise on North American oology as we have of its ornithology in Baird, Ridgway, and Brewer's History of North American Birds, published in 1874.

Dr. Hermann Schalow, of Berlin, in the "Ornithologische Monatsberichte," January, 1893, wrote:

The original water-color drawings were made from nature by John L. Ridgway, and are reproduced in lithography in a most admirable fashion. The plates far surpass the best with which we are familiar.

Dr. R. Bowdler Sharpe, of the British Museum, in "Nature," November 2, 1893, wrote:

The figures are beautifully rendered by chromolithography, and the publication is altogether a notable one. The letterpress is the work of Capt. Charles Bendire, who is known to be one of the most practiced oologists of the present day. He has described and figured in the present volume the eggs of all the North American game-birds, pigeons, and birds of prey, and he has used his opportunity to the greatest advantage by giving an excellent account of the life-histories of the species, together with the latest information respecting their geographical distribution. Capt. Bendire's work forms one of the most important of the recent contributions to ornithological knowledge, and the succeeding volumes will be awaited with interest by ornithologists.

Special allusion should be made to the very important cooperation of Dr. William L. Ralph, of Utica, N. Y. Dr. Ralph has for twenty years been forming a collection of the eggs and nests of North American birds, very complete for the entire continent, though especially rich in southern and extremely northern forms. This collection, which is one

of the most important and most beautifully prepared in existence, is especially valuable to the student on account of the thorough and scholarly manner in which it is catalogued and labeled, has been given by him to the Smithsonian Institution, and nearly half of it, numbering about 3,250 eggs, has already been transferred to the custody of the curator.

The collection is being constantly increased, and Dr. Ralph spares no expense in obtaining representatives of rare species. By this agency alone at least sixty species, either not at all represented or represented by worthless specimens, have up to the present time been added.

A large number of other gifts have been received, of which those of Dr. A. K. Fisher, Dr. E. A. Mearns, U. S. Army, Lieut. H. C. Benson, U. S. Army, and Walter F. Webb are the most extensive, including each over fifty specimens.

The curator prints the following statistical memorandum:

*Present state of the collection.*

Specimens in North American series.....	37,338
Specimens in North American duplicates.....	11,759
Specimens on exhibition.....	1,491
Total.....	50,588
Species and subspecies in the North American series.....	781
Specimens in foreign series.....	4,419
Specimens in foreign duplicates.....	231
Total.....	4,650
Species in foreign series.....	624
Nests in North American reserve series.....	2,656
Nests on exhibition.....	235
Total.....	2,891
Last catalogue entry in June, 1892, 25,170.	
Last catalogue entry in June, 1893, 25,935.	

DEPARTMENT OF REPTILES AND BATRACHIANS.

Dr. Leonhard Stejneger, the curator of these collections, reports that if the progress of the department be measured by the number of specimens received and entered upon the books, the activity of the past year has been unprecedented, no less than 2,302 specimens having been catalogued.\* Some of these have furnished types for quite a number of recently described species, both from this country and abroad.

As a consequence of the greatly increased number of specimens received during the present year, the routine work of installing, identifying, caring for, labeling, and reporting upon them has been more than twice as great as during any previous year. The department has

\* For comparison it may be mentioned that the number of entries in 1891-'92 was 1,055; in 1890-'91, 908; in 1889-'90, 705; in 1888-'89, 784; in 1887-'88, 19; in 1886-'87, 138.

also had on hand the preparation of its part of the exhibit for the World's Columbian Exposition in Chicago, so that the curator and his assistant have had their time fully occupied without much chance of effecting a better arrangement of the old collections.

The curator has been specially engaged in the care of the collection of reptiles obtained in Death Valley by the expedition sent out from the U. S. Department of Agriculture, in charge of Dr. C. Hart Merriam, and has furnished a special report which, accompanied by four plates, was published in *North American Fauna*, No. 7, May, 1893. In this are described 11 new species and subspecies, while a number of forms described by previous authors are more fully reported upon.

Among the most interesting additions to the collection is a new species of *Xantusia*, described by Dr. Stejneger as *X. Henshawi*.<sup>\*</sup> This lizard belongs to a genus peculiar to California, two species only being previously known. The new species is remarkably distinct and forms altogether one of the most interesting herpetological novelties obtained in this country during recent years. I may add that the present species is only part of a very valuable collection sent home by Mr. Henshaw from southern California.

There has also been received another collection which throws considerable light on the geographical distribution of species in the southwestern portion of the United States and contains many rare species. This was presented by Dr. Timothy E. Wilcox, U. S. Army, who collected at Fort Huachuca, Ariz.

Of extralimital collections obtained during the present year may be mentioned those made by Mr. P. L. Jouy in various parts of Mexico; by Mr. Charles W. Richmond in Nicaragua, and by Mr. Harry W. Perry in Honduras.

Especially important have been the collections received from Africa. The Museum has been particularly deficient in material from that part of the world, but thanks to the zeal and generosity of two American gentlemen, this deficiency is now gradually being remedied. Mr. William Astor Chanler has sent collections from the east coast of the mainland between the mouth of the Tana River and Hamaye, about 300 miles inland, and Dr. W. L. Abbott, others from the Seychelles and various other groups of islands off the east coast of Africa. The study of the former collection by Dr. Stejneger reveals many rare and undescribed species, while the latter furnishes the material for a full list of the herpetological fauna of the islands in question, which also shows a number of new species.

Among other prominent contributors are Profs. J. T. Scovell and A. J. Woolman; Julius Hurter, St. Louis, Mo.; F. Stephens, Santa Ysabel, Cal.; Herbert Brown, Tucson, Ariz.; Dr. E. A. Mearns, of the United States and Mexican Boundary Commission; George E. Harris,

<sup>\*</sup> Discovered in southern California by Mr. H. W. Henshaw.

Cassville, Mo.: Prof. B. W. Evermann, of the U. S. Fish Commission; L. Belding, Stockton, Cal.

The work of Dr. Stejneger on the proposed supplementary volume of the Nomenclator Zoologicus has progressed as fast as could be expected, and by the end of the year more than 17,000 generic terms had been card-catalogued and arranged alphabetically by classes. It is evident that the original maximum estimate of 20,000 genera will be reached or even exceeded.

Excellent facilities for studying the collections have been extended to Prof. E. D. Cope, who, among other subjects studied, made extended anatomical researches for his new ophiological system, and to Dr. O. P. Hay, for finishing his work on the Indiana reptiles.

The estimate of the curator shows the status of the collection on June 30, 1893, to be as follows:

	Specimens.
Reserve series.....	18,222
Duplicate series.....	8,705
Unassorted and exotics.....	6,313
Grand total.....	33,240

Last catalogue entry in June, 1892, 18,191.

Last catalogue entry in June, 1893, 20,493.

The exhibit of the reptiles and batrachians at the World's Columbian Exposition comprised two classes of objects, viz: (1) Groups of casts and mounted specimens, and (2) a series of specimens illustrating representative American families.

Owing to lack of space and time three groups only were exhibited, though work on several more had been planned and partly begun.

The first group consisted of 14 casts of some of the more typical poisonous snakes occurring within the United States, as for instance, various species of rattlesnakes, the water moccasin, the copperhead, and the harlequin snake. The snakes were shown coiled or crawling among rocks, roots of trees, dead leaves, moss, etc. The accessories were not intended in every case to represent the actual surroundings of the species, as the specimens belonged to species inhabiting widely separated localities, and were exhibited together for the purpose of contrasting the various types. The casts composing the group were mostly of plaster, while two were made of a glue composition. They have in every instance been made from specimens sent alive to the Museum, several of them expressly for the Chicago exhibit. Among these I would call special attention to the magnificent Texas rattlesnake (*Crotalus atrox*) and the red California rattler (*C. rubidus*) from southern California.

The second group comprised 33 casts and mounted specimens of different types of land and fresh-water turtles inhabiting the United States, including gophers, box tortoises, terrapins, mud turtles, soft-shelled turtles, etc., the accessories, as in the snake group, illustrating in a general way only their natural surroundings, water and sandy beaches consequently predominating.

The third group showed a fine yellow boa, from Jamaica, in the act of climbing the branches of a tree, typifying the non-venomous snakes in contrast to the group of poisonous ones.

The second class of objects consisted of 68 species in alcohol, this series being destined to illustrate by typical specimens the families of reptiles and batrachians occurring in the Western Hemisphere. Altogether 48 families were shown, several of the larger ones being represented by a series of species to illustrate the extremes of forms included in them. All the specimens were carefully mounted upon glass plates, in imitation of the natural positions of the animals, and displayed in square glass jars, the larger ones in Dorfinger jars, the smaller, in Benedict plate-glass jars. The great advancement of this mode of exhibiting alcoholics over the old one of simply suspending the animal in a round jar, was very striking. The plate-glass jars especially are so beautiful and the animals show to such an advantage that it is hoped that the experiments which are now being made for improvements in their manufacture may meet with success. Each jar was provided with two printed labels, one family label giving in a few terms the scientific characteristics of the family, in addition to a brief popular account of its other peculiarities, as well as the geographical distribution, the other label being the specimen label containing the popular and scientific names, locality, Museum number, and donor's or collector's name.

A systematic series of alcoholic specimens, representing the following families of American reptiles and batrachians:

#### REPTILES.

Crocodiles, *Crocodylida*.

Tortoises, families *Chelydridæ*, *Kinosternidæ*, *Testudinidæ*, *Emydidæ*, *Cheloniidæ*, *Dermochelydidæ*, and *Trionychidæ*.

Lizards, families *Eublepharidæ*, *Gekkonidæ*, *Anolidæ*, *Iguanidæ*, *Helodermatidæ*, *Anguidæ*, *Anniellidæ*, *Xantusiidæ*, *Teiidæ*, *Scincidæ*, *Bipedidæ*, *Amphisbaenidæ*.

Snakes, families *Typhlopidae*, *Leptotyphlopidae*, *Hysiidae*, *Boidæ*, *Charinidæ*, *Natricidæ*, *Nothopsidæ*, *Amblycephalidæ*, *Boigidæ*, *Elapidæ*, *Hydrophidæ*, *Crotalidæ*.

#### BATRACHIANS.

Salamanders, families *Proteidæ*, *Cryptobranchidæ*, *Amblystomatidæ*, *Plethodontidæ*, *Desmognathidæ*, *Salamandridæ*, *Amphiumidæ*.

Cæcilians, family *Cæciliidæ*.

Sirens, family *Sirenidæ*.

Toads and frogs, families *Bufonidæ*, *Pelobatidæ*, *Hylidæ*, *Cystignathidæ*, *Engystomatidæ*, *Dendrobatidæ*, *Ranidæ*.

Although not very extensive, the herpetological exhibit attracted much attention, particularly the two large groups, which were constantly surrounded by a crowd of interested and appreciative visitors to the Fair.

#### DEPARTMENT OF FISHES.

The honorary curator, Dr. Tarleton H. Bean, was placed in charge of the exhibit of the U. S. Fish Commission at the World's Columbian



Exposition, and this, together with his other duties in connection with the Commission, has enabled him to devote but little time to the work of the Museum. He has cooperated with the Assistant Secretary in the preparation of a Museum publication, "Oceanic Ichthyology," which is now in press. Mr. Barton A. Bean, assistant curator, has been engaged in the routine work of the department in the preparation of the exhibit for the Exposition at Chicago, and in the arranging of drawings of deep-sea fishes for publication. A general rearrangement of the collection of the department is needed, and will be undertaken this fall. There have been 418 catalogue entries; the number of specimens received is about 1,000.

The most important collections contributed have been received from the U. S. Fish Commission, especially the additional deep-sea and oceanic forms collected by the steamer *Albatross*.

This exhibit at the World's Fair consisted of 154 families and sub-families, represented by 197 species of the fishes of North and South America. The specimens were displayed in rectangular glass jars, to which were attached labels giving a diagnosis setting forth the family characters, followed by a statement of the number of the genera and species in the family, their geographical range, and an account of their habits, food, and uses. Small species labels were also attached to designate individuals or groups of individuals. The object was to make a popular and instructive exhibit of the fishes of the Western Hemisphere, which aim was satisfactorily carried out by the means employed for the display.

The following is a list of the families and subfamilies represented:

## FISHES.

- |  |   |
|--|---|
| <i>Orthogoriscidae</i> , the Ocean Snn-fishes. | <i>Xiphidiontida</i> , the Butter Eels.         |
| <i>Tetradontida</i> , the Swellfishes.         | <i>Anarrhichadida</i> , the Wolf Fishes.        |
| <i>Diodontida</i> , the Porenpine-fishes.      | <i>Cebelichthyida</i> , the Monkey Blennies.    |
| <i>Ostracionida</i> , the Trunk-fishes.        | <i>Blenniida</i> , the Blennies.                |
| <i>Balistida</i> , the Trigger-fishes.         | <i>Opisthoguathida</i> , the Big-eyed Blennies. |
| <i>Hippocampida</i> , the Sea-horses.          | <i>Batrachida</i> , the Toad-fishes.            |
| <i>Syngnathida</i> , the Pipe-fishes.          | <i>Leptoscopida</i> , the Small Star-gazers.    |
| <i>Malthida</i> , the Bat-fishes.              | <i>Uranoscopida</i> , the Star-gazers.          |
| <i>Lophiida</i> , the Anglers.                 | <i>Bathymasterida</i> , the Ronquils.           |
| <i>Ceratiida</i> , the Small Anglers.          | <i>Chiasmodontida</i> , the Great Swallowers.   |
| <i>Autenuariida</i> , the Frog-fishes.         | <i>Thichodontida</i> , the Sand-fishes.         |
| <i>Soleida</i> , the Soles.                    | <i>Gobiesocida</i> , the Clinging Gobies.       |
| <i>Pleuronectida</i> , the Flounders.          | <i>Liparidida</i> , the Sea Snails.             |
| <i>Macrurida</i> , the Grenadiers.             | <i>Cyclopterida</i> , the Lump-fishes.          |
| <i>Fierasferida</i> , the Fierasfers.          | <i>Callionymida</i> , the Dragonets.            |
| <i>Ophidiida</i> , the Donzellias.             | <i>Gobiida</i> , the Gobies.                    |
| <i>Brotulida</i> , the Brotulids.              | <i>Triglida</i> , the Gurnards.                 |
| <i>Gadida</i> , the Cod-fishes.                | <i>Aguonida</i> , the Alligator-fishes.         |
| <i>Merluccida</i> , the Whitingis.             | <i>Cottida</i> , the Sculpins.                  |
| <i>Lycodida</i> , the Eel Pouts.               | <i>Hemirhamphida</i> , the Sea Ravens.          |
| <i>Ammodytida</i> , the Sand Lances.           | <i>Scorpaenida</i> , the Rock-fishes.           |
| <i>Cryptacanthida</i> , the Wry-months.        | <i>Chirida</i> , the Chiroids.                  |
| <i>Stichida</i> , the Eel Blennies.            | <i>Scarida</i> , the Parrot-fishes.             |

- Labridæ*, the Wrasses.  
*Pomacentridæ*, the Demoiselles.  
*Cichlida*, the Cichlids.  
*Embiotocida*, the Viviparous Perches.  
*Gerrida*, the Moharras.  
*Polynemida*, the Thread-fins.  
*Acanthurida*, the Surgeons.  
*Chatodontida*, the Chatodens.  
*Ephippida*, the Angel-fishes.  
*Xiphiida*, the Sword-fishes.  
*Trichiurida*, the Cutlass-fishes.  
*Scombrida*, the Mackerels.  
*Carangida*, the Pompanoes.  
*Coryphaenida*, the Dolphins.  
*Stromateida*, the Butter-fishes.  
*Pempherida*, the Pempherids.  
*Zenida*, the Dories.  
*Bramida*, the Pomfrets.  
*Nomeida*, the Nomeids.  
*Latilida*, the Tile-fishes.  
*Mullida*, the Red Mulletts.  
*Holocentridæ*, the Squirrel-fishes.  
*Berycida*, the Beryxes.  
*Sciænida*, the Drum-fishes.  
*Sparida*, the Sea Breams.  
*Pimelepteraida*, the Rudder-fishes.  
*Pristipomatida*, the Grunts.  
*Centrarchida*, the Sun-fishes.  
*Elassomatida*, the Elassomes.  
*Serranida*, the Sea Basses.  
*Percida*, the Perches.  
*Apogonida*, the Coral Fishes.  
*Centropomida*, the Snooks.  
*Pomatomida*, the Blue-fishes.  
*Elaeotida*, the Cobias.  
*Priacanthida*, the Big-eyes.  
*Aphredoderida*, the Pirate Perches.  
*Sphyranida*, the Barracudas.  
*Echeneidida*, the Remoras.  
*Trachypterida*, King-of-the-Herrings.  
*Atherinida*, the Silversides.  
*Mugillida*, the Mulletts.  
*Gasterosteida*, the Stickle-backs.  
*Aulorhynchida*, the Flute-mouths.  
*Fistulariida*, the Trumpet-fishes.  
*Centriscida*, the Snipe-fishes.  
*Belonida*, the Silver Gars.  
*Erocotida*, the Flying Fishes.  
*Amblyopsida*, the Cave Fishes.  
*Luciida* (Esocida), the Pikes.  
*Umbrida*, the Mud-minnows.  
*Dallida*, The Dallias.  
*Cyprinodontida*, the Mummichogs.  
*Characinida*, the Characines.  
*Percoptida*, the Trout Perches.  
*Halosaurida*, the Halosaurids.  
*Channiodontida*, the Tiger Fishes.  
*Sternopterychida*, the Hatchet-fishes.  
*Stomiatida*, the Stomiatoïds.  
*Scopelida*, the Pearl Fishes.  
*Synodontida*, the Snake-fishes.  
*Argentinida*, the Smelts.  
*Salmonida*, the Salmon and Trouts.  
*Alepidosaurida*, the Handsaw Fishes.  
*Alepocephalida*, the Alepocephalids.  
*Hiodontida*, the Moon-eyes.  
*Albulida*, the Lady-fishes.  
*Elopidæ*, the Big-eyed Herrings.  
*Chanida*, the Milk-fishes.  
*Clupeida*, the Herrings.  
*Dorosomida*, the Gizzard Shads.  
*Eugraulida*, the Anchovies.  
*Catostomida*, the Suckers.  
*Cyprinida*, the Minnows.  
*Sternopygida*, the Electric Cat-fishes.  
*Gymnotida*, the Electric Eels.  
*Silurida*, the Cat-fishes.  
*Loricariida*, the Loricarions.  
*Symbranchida*, the Symbranchids.  
*Congrida*, the Conger Eels.  
*Anguillida*, the Eels.  
*Muraenida*, the Morays.  
*Nemichthyida*, the Snipe Eels.  
*Synaphobranchida*, the Synaphobranch Eels.  
*Simenchelyida*, the Pug-nosed Eels.  
*Saccopharyngida*, the Gulpers.  
*Eurypharyngida*, the Pelican Fishes.  
*Notacanthida*, the Spiny Eels.  
*Amiida*, the Bow Fins.  
*Lepidosteida*, the Gar Pikes.  
*Polyodontida*, the Paddle-fishes.  
*Acipenserida*, the Sturgeons.  
*Chimæridæ*, the Chimæras.  
*Myliobatida*, the Eagle Rays.  
*Trygonida*, the Sting Rays.  
*Torpedinida*, the Torpedoes.  
*Raiida*, the Skates.  
*Pristida*, the Saw-fishes.  
*Squatinaida*, the Angel Sharks.  
*Heterodontida*, the Port Jackson Sharks.  
*Alopiida*, the Thresher Sharks.  
*Sphyrnida*, the Hammer-headed Sharks.  
*Galeorhinida*, the True Sharks.  
*Spinacida*, the Dog Sharks.  
*Seymniida*, the Sleeper Sharks.  
*Petromyzontida*, the Lampreys.  
*Myxiniida*, the Hag-fishes.  
*Branchiostomatida*, the Lancelets.

## DEPARTMENT OF VERTEBRATE FOSSILS.

The work in this department of the Museum during the past year has been partly devoted to mounting and labeling the specimens already placed in cases in the exhibition room, and this work has been under the special charge of Mr. F. A. Lucas.

The preparation of specimens secured by the honorary curator, Prof. O. C. Marsh, during his explorations in the West for the U. S. Geological Survey, has been continued at New Haven, and good progress has been made, but the want of proper space to exhibit such specimens has prevented any of these being placed on exhibition in the National Museum during the past year.

The curator proposes to use the wall space above the cases for a series of life-size restorations of the large extinct animals especially characteristic of North America, and an important beginning has been made by the production of a series of six restorations under the immediate direction of Prof. Marsh. These restorations represent on canvas the skeletons, natural size, of 2 gigantic Dinosaurian reptiles from the Jurassic formation, *Ceratops* and *Stegosaurus*; 2 others from the Cretaceous, *Clasaurus* and *Triceratops*; and 2 huge mammals from the Tertiary, *Tinoceras* and *Brontotherium*. These restorations have been made with great care, from type specimens, and this exhibition will be of much interest to the general public. Similar restorations of other extinct animals are in preparation.

The curator has published, during the past year, several papers relating indirectly to the collections of vertebrate fossils mentioned above, though more intimately in connection with the U. S. Geological Survey. In memoirs now in preparation, however, he will describe fully the more important specimens he has already deposited in the National Museum.

There have been 13 specimens received during the year, involving the same number of catalogue entries.

## DEPARTMENT OF MOLLUSKS.

The curator, Mr. W. H. Dall, reports that satisfactory progress has been made in routine work during the year. The arrangement of specimens in the exhibition cases in the lower hall has been completed. The general collection has been revised, the species conveniently arranged for reference, and index sheets for each drawer, containing a list of the genera and species in each tray, have been prepared. At the same time the names of the species have been checked off on an interleaved copy of Paetel's Catalogue of Mollusks, thus facilitating reference to the collection and indicating deficiencies more clearly. Duplicates have been eliminated and packed away in their proper boxes, as described in my last annual report. New material has been examined, labeled, and distributed to its proper place in the collection

after registration. Much attention has been paid to the Tertiary fossils, in which the collection is very rich, and which were urgently needed for comparison with the material brought in by the U. S. Geological Survey. The entire collection of Tertiary fossils has been arranged for easy reference, and a provisional card catalogue of localities and horizons has been prepared. Much of the material from the Miocene has been cleaned, separated, arranged, and registered, and provided with labels showing locality, collector, etc., though in many cases the names had to be omitted until the specimens shall have been more thoroughly studied. A large part of the registration for the year has related to this class of specimens. The amount of registration is shown in the following table:

Species of duplicates catalogued .....	281
Card catalogue of the same .....	281
Drawings registered .....	29
Envelopes filled out for drawings .....	29
Total .....	620

Adding to these the number of actual registrations for the year we have a grand total of about 5,738 entries, as against a similar total of 7,700 for 1891-'92.

The number of accessions during 1892-'93 was 72, against 85 in 1891-'92. Several of them were of importance and many of great interest, but, as a whole, the accessions during the past year do not comprise any very large single masses of material compared with those of some previous years.

The most important contribution to the collection has been the result of a decision by the Rev. L. T. Chamberlain and Mrs. Frances Lea Chamberlain to contribute the means necessary to bring up to date and keep as complete as practicable the Lea collection of fresh-water mollusks, especially the *Unionida*. In pursuance of this very desirable object, they have generously furnished the means for the purchase of several unique series of Asiatic and African unios, and have authorized the ordering of others, when necessary, for the object in view. Nearly all the material thus acquired is rare and new to the collection, and of the utmost value for the study of the group to which it belongs. Looking forward to the publication of a catalogue of the Lea Collection as one of the special bulletins of the Museum, Mr. and Mrs. Chamberlain have also generously added to the sectional library by authorizing the purchase of such works of recent date on the *Unionida* as are necessary to the studies involved and not yet contained in the Museum library. Several costly and important works have already been ordered or received under this arrangement, and more will follow. Our sincere thanks are due to Mr. and Mrs. Chamberlain for their wise and considerate generosity, which not only benefits science and the Museum, but continues the association of the name of Lea with prog-

ness in the study of these groups of animals in a graceful and most gratifying way.

In completion of an exchange sometime since entered into between Mr. Dall and Mr. Maurice Cossmann, of Paris, the successor of Deshayes in the minute study of the successive eocene faunas of the Parisian basin, the latter has sent to the Museum about 700 named species of mollusks from that formation, which, coming from him, have the authenticity of types. Several desiderata of the Museum have been supplied by Mr. Hugh Fulton, of London, through an exchange arranged with him, all of which were new to the collection, and several of extreme rarity and value.

From Dr. W. L. Abbott has been received an interesting and very attractive lot of shells from the Seychelles and adjacent islands. The California Academy of Sciences, through Dr. J. G. Cooper, has donated about 75 specimens of land shells from the peninsula of Lower California, most of which were very acceptable additions to the collection. Our faithful correspondent, Mr. I. Gregor, has continued his contributions to the Museum by donating specimens in alcohol of the rare *Murex fulvescens* Sby., from Fernandina, Fla., and a number of interesting pathological specimens showing how mollusks repair the injuries they occasionally receive. Dr. H. von Ihering has contributed some interesting land and fresh-water shells from Brazil, and Rev. H. Loomis others from Japan. Dr. Edgar A. Mearns, of the International Boundary Survey between the United States and Mexico, has forwarded the mollusks collected by the party, including a new species of *Anodonta*, with a view to the preparation of a report on the expedition and its collections. From Mr. J. D. Mitchell and Mr. J. A. Singley, and also the State geological survey of Texas, have been received interesting miscellaneous collections, including several species not before reported from the Texas coast, and a few which appear to be undescribed. Mr. Charles W. Richmond has furnished a few interesting species from the Nicaraguan region. Mrs. Ada M. Walton sent to the Museum a collection of specimens from the coast of California, which, from certain circumstances connected with the donation, deserves special mention, though the collection added little to the Museum series which was not already represented there. Mr. Ed. Saxon Wyard presented a few large ornamental shells, which, from their unusual size and beauty, were very desirable for exhibition purposes. Mr. William Moss, of Ashton-under-Lyne, England, contributed some microphotographs of the radula, etc., of various British mollusks, which were exceptionally successful in showing difficult anatomical details. An exchange with Mr. B. H. Wright added a few desirable Unionidae to the collection. The Department of Agriculture and the U. S. Fish Commission have contributed several lots of mollusks collected by members of their staffs.

Besides the work above referred to, the general operations of the department include the preparation of special reports on collections

made under governmental auspices by various organizations, such as the U. S. Fish Commission, the U. S. Navy, the Revenue Marine, the Department of Agriculture, and special expeditions. Among them are two which bear particularly on the Tertiary geology and paleontology of the southeastern border of the United States. One of these (Bulletin 84 of the U. S. Geological Survey, by William H. Dall and Gilbert D. Harris) summarizes our knowledge of the post-eocene Tertiary geology of the United States, including Alaska, up to about 1890, the manuscript having been delayed in printing nearly two years. The other is the second part of a report by the writer on the Tertiary fauna of Florida, including the gastropods and containing much new material. A third part, to comprise the Pelecypods and a geological summary, will conclude the work. In addition may be mentioned certain reports on faunal collections of the Southern States and a small collection from eastern Siberia, and further researches by Mr. Simpson on the *Unionida*.

Mr. Dall speaks as follows of the state of the collection:

In previous reports I have explained why it is not possible to give the exact number of species, specimens, duplicates, etc., contained in the collection. In my last report it was estimated that the collection contained about 482,725 specimens, of which about 100,000 are preserved in alcohol. During the year about 5,600 specimens were received, which would make a present total of 488,325 specimens now contained in the collection. The number of entries in the register for 1892-'93 is 4,578, as shown in the appended table, representing some 13,734 specimens.

Volume.	From—	To—	Total.	Remarks.
XXIII .....	106,904	106,981	77	Volume in use.
XXIV .....	112,401	115,307	2,906	Reserved for fossils
XXVI .....	124,633	125,425	762	Volume filled.
XXVII .....	125,426	126,259	833	Volume in use.
Total .....			4,578	

The total number of registrations to date, deducting all duplications and omissions in the register, is 107,591, representing about 322,800 specimens catalogued to date. The number of workers and their distribution in the building render it necessary to use simultaneously several volumes of the register, which explains why the foregoing table is necessary to show the total registrations for the year. The formal registration, with the gaps alluded to, terminates June 30, 1893, with the number 126,259.

The work of assisting students in various parts of the country to identify their local fauna, to intelligently direct their studies, and to answer their numerous queries on different branches of the subject has always been regarded as an important function of this department, and has been made a special care by Mr. Dall, who states that correspondence of this kind was conducted in 1891-'92 with 166 different persons, involving over 300 letters and 600 to 700 pages of writing, besides the identification of many hundred specimens, while in 1892-'93, 96 different persons received 330 communications, involving some 800 pages of writ-

ing, nearly all of which was the work of the curator. For want of time, owing to the press of work and absence of sufficient clerical assistance, the number of species identified for students has not been recorded. In 1891-'92 the number amounted to over 3,000 species, for each of which a label had to be written. During the past year the number sent for identification was considerably less.

#### DEPARTMENT OF INSECTS.

In this department, under Prof. C. V. Riley, honorary curator, considerable time has been devoted to the preparation of exhibits for the World's Columbian Exposition. In this work the Museum has cooperated with the Division of Entomology in the U. S. Department of Agriculture. The exhibit, while devoted largely to the science of entomology economically considered, also contained much material of purely educational or scientific value. The systematic collection of North American families and the collection of insects injurious to forestry were rearranged. A large amount of material has been identified for correspondents, and many students have been aided in their work by means of loans and exchanges.

Among the most important accessions were:

From Prof. A. L. Montandon, Bucharest, Roumania, 374 species, including 2,332 specimens, mostly exotic hemiptera not previously represented in our collection, and especially valuable as being identified by this well-known specialist.

Coleoptera, representing the saline fauna of Great Salt Lake Basin, Utah, 30 species from H. G. Hubbard, Detroit, Mich., and E. A. Schwarz, Washington, D. C.

A collection of East African insects of all orders (more than 300), from William Astor Chanler, Hamaye-on-Tana, East Africa. Donated on condition of having them studied and afterwards divided with the Imperial Museum in Vienna, Austria.

A collection of miscellaneous insects (66 species), from Kashmir, from Dr. W. L. Abbott.

A collection of European Muscidae (98 species), illustrating Brauer and Bergensstamm's classification of this group, from the Imperial Museum of Vienna, Austria, through Dr. F. Brauer.

North American Noctuidae (63 species), from Prof. J. B. Smith, New Brunswick, N. J., mostly types of new species described by him either in the Museum Bulletins or in the journals especially devoted to North American entomology.

A collection of insects, mostly Coleoptera (296 specimens), collected in Mexico by J. T. Mason, Jalapa, Mexico, from the curator.

The following statement as to the condition of the collection is presented by the curator:

The following table indicates the number of specimens in the reserve, exhibition and duplicate series:

Specimens.	Collection.	Native or exotic.	Species.	Examples.
Hymenoptera.....	Reserve.....	Native.....	3,500	20,000
	do.....	Exotic.....	1,000	2,000
	Duplicate.....			2,000
	Exhibit.....			1,000
Neuroptera.....	Reserve.....	Native.....	500	2,000
	do.....	Exotic.....	200	500
	Exhibit.....			200
Orthoptera.....	Reserve.....	Native.....	600	6,000
	do.....	Exotic.....	400	2,000
	Duplicate.....			3,000
	Exhibit.....			1,000
Coleoptera.....	Reserve.....	Native.....	7,200	50,000
	do.....	Exotic.....	7,300	30,000
	Duplicate.....			300,000
	Exhibit.....			10,000
Lepidoptera.....	Reserve.....	Native.....	4,500	60,000
	do.....	Exotic.....	3,000	10,000
	Duplicate.....			35,000
	Exhibit.....			4,000
Hemiptera.....	Reserve.....	Native.....	2,500	20,000
	do.....	Exotic.....	2,000	5,000
	Duplicate.....			3,000
	Exhibit.....			1,000
Diptera.....	Reserve.....	Native.....	4,000	20,000
	do.....	Exotic.....	800	2,000
	Duplicate.....			2,000
	Exhibit.....			1,000
Arachnida.....	Reserve.....	Native.....	350	2,500
	do.....	Exotic.....	150	500
	Exhibit.....			200
Myriapoda.....	Reserve.....	Native.....	200	2,000
	do.....	Exotic.....	50	200
	Exhibit.....			100
Total.....			38,250	598,200

#### INCREASE OF THE COLLECTION.

The collection has increased during the year by the addition of about 7,000 specimens. The last catalogue entry for June, 1892, was No. 1041.

The last catalogue entry for June, 1893, was No. 1260.

The routine work of the year has consisted chiefly of making up collections for exchange; reports on accessions for examination and report, about 100 such reports having been made during the year; naming of specimens for collectors (about 50 larger and smaller series of insects of all orders have been identified for correspondents, representing more than 2,000 species); the selection of material to send to specialists for study and determination; mounting and labeling of specimens; identifying the material of the accessions and incorporating it in the collections. This is generally done in connection with the work of arranging all the collections in permanent shape.



(a) *Reserve collections.*—In the *Diptera*, rearrangements have been made principally in the families *Tachinida* and *Bombyliida*. To the *Lepidoptera* much time has been devoted in all groups, both in the systematic and biologic series. In the *Coleoptera* several groups like the *Eumolpini* and *Hydrobini* have been rearranged. In the *Hymenoptera* recessions have been incorporated. In the *Hemiptera* all the unarranged material has been incorporated and the entire collection has been arranged.

(b) *Duplicate collections.*—These are generally arranged in connection with the corresponding reserve collections, but an exception was made this year in selecting a special series of North American *Coleoptera*, containing two specimens each of all the species (2,212) available from the general duplicate collection. This will facilitate exchanges.

(c) *Exhibit collections.*—In order to temporarily fill up the vacancies in the Museum exhibition hall caused by the transportation to Chicago of the larger portion of the material, 56 exhibit boxes were prepared from duplicates of native and exotic insects. At the beginning of the fiscal year a series of North American insects were selected, showing 181 species that have more commonly-used vernacular names. These were arranged in 7 boxes and put on exhibition.

Several of the papers by the curator, enumerated in the Bibliography (Appendix VII), are based largely on Museum material. Dr. A. S. Packard, who is engaged in the study of the North American Bombycid moths, has been allowed free study of the Museum collection, and was granted the loan of such species as required a more detailed investigation. Various papers have already appeared in the *Canadian Entomologist* and in the *Journal of the New York Entomological Society* on this subject. Mr. William Fox, of the Academy of Natural Sciences, Philadelphia, has borrowed the collection of the genus *Trypoxylon* of the family *Pemphredonida*, to assist him in his review of this group, published in the *Transactions of the American Entomological Society*. Prof. A. L. Montandon, of Bucharest, Roumania, has, by exchange material from the Museum, been assisted in studying the North American *Hemiptera-Heteroptera*, and as a result has published in the *Proceedings of the Museum*, Vol. XVI, pp. 45-52, "Notes on American *Hemiptera-Heteroptera*." Dr. F. W. Goding in his "Synopsis of the Subfamilies and Genera of the Membracidae of North America" has studied Fitch's types, especially in the Museum collection, and his "Membracidae of St. Vincent Island, West Indies," in the *Canadian Entomologist* for February, 1893, pp. 53-56, contains seven new species from types in the Museum collection. Mr. O. F. Cook has studied the *Lithobiida* in the collection and borrowed the African Myriapods of Abbott's collection for study and special report. Mr. Samuel H. Scudder has studied the Orthoptera of the Galapagos Islands, and Mr. William H. Ashmead has completed a valuable monograph of the *Proctotrypida*, based on material in the Museum. Mr. L. O. Howard has continued his work upon the host relations of parasitic Hymenoptera, and has also prosecuted certain special studies on the *Chalcidida*, while Mr. C. L. Marlatt has been engaged upon the revision of the *Teuthredinida*.

Prof. Riley also contributes the following notice of the exhibits in entomology in the Government building at the World's Fair:

The fact of the intimate connection of the Department of Insects in the National Museum with the Entomological Division of the Department of Agriculture, led to a certain and necessary commingling of interests in the arrangement for the representation of the two at the World's Columbian Exposition. The main Government exhibit in entomology was therefore brought together in the agricultural section of the Government building, and while largely devoted to the economic phases of the subject, in which particular it more closely represented the Department of Agriculture, it contained also a large number of exhibits purely educational or scientific in scope, which appertained more strictly to the Museum material and work. Of the former also practically all the insect material was drawn from the Museum, largely,

however, from the biologic and other collections transferred from the Department of Agriculture at or subsequent to the practical union of the two branches of Government work in entomology. The expense attending the preparation of all these exhibits, the securing of new cases, and the purchase of much new material, was defrayed, however, from the appropriation for the Department of Agriculture. In addition to the above, and to properly represent the Department of Insects in the National Museum, in conjunction with the exhibits of the Department of Agriculture, a showing was made in the Museum section covering a branch of the subject not included in the displays in the agricultural section. This consisted of a very elaborate and complete exposition of the characteristics of the families of American insects and their allies among the *Arthropods*. The general charge of the preparation of the exhibit of the Department of Agriculture was assigned to Mr. C. L. Marlatt, who also attended to its installation at Chicago, as well as of the Museum exhibit proper, which Prof. J. B. Smith was employed to prepare. The exhibits of the Agricultural Department and of the Museum may be described somewhat in detail as follows:

That of the Museum occupied 24 boxes of the standard Museum size, and consisted of a graphic representation, by means of specimens and figures, of the grosser features of the classification of insects and their near allies in the subkingdom *Arthropoda*. Included in this were illustrations of the subclasses, orders, and minor groups down to and including the families of the classes *Insecta*, *Malacopoda*, *Myriapoda*, *Acarida* and *Arachnida*. In addition to sample representative exhibits with each of the groups from class down to family, in many cases also with figures illustrating typical specimens or structural details, were brief but intelligent and accurate definitions of the groups, carefully prepared and in the form of large labels. The amount of labor thus entailed will be better appreciated from the fact that to do this required the preparation of over 500 group characterizations. This exhibit while not a large one in the amount of space occupied, was much more complete than anything hitherto attempted of its kind, and was most instructive in representing and defining in small space the entire scheme of the more general features of classification of *Arthropods*, other than Crustacea.

The larger and main display in the agricultural section, representing primarily the Division of Entomology of the Department of Agriculture, may be described under the several sections into which it naturally divides itself, viz: (1) Injurious and beneficial insects; (2) systematic and biologic entomology; (3) professional entomological exhibits; (4) insecticides and insecticide apparatus; (5) entomological publications, and (6) illustrations, maps, and charts. Of these the first three sections contain material drawn from the National Museum, with the addition of much new and original matter; the others are entirely original, and were prepared especially for the exhibit of the Division of Entomology of the Department of Agriculture.

The economic series, namely, insects injurious to agriculture, had, as a basis, the old economic material which has hitherto been exhibited at various previous expositions, but which, on account of its great educational value, could not well be omitted. It was, however, greatly extended and made to include the results of the later studies of life-histories and remedies, and was entirely remodeled and rearranged in new cases, with new labels, and was for the most part fresh material. It included over 600 special exhibits of injurious species, affecting 31 distinct cultivated plants, in addition to insects injurious to live stock and household pests. The number of exhibits of injurious species affecting some of the leading plants represented were cabbage, 34; apple, 35; orange, 36; cotton, 37; grape, 43; clover, 67; and Indian corn, 129. Each of these exhibits gave a life-history, illustrated by specimens and figures, natural enemies, together with references to the literature and instruction as to remedies. In this same category comes the collection of forest insects, which occupied eight standard Museum drawers, and included the principal insect enemies of the leading forest trees of economic importance.

A very prominent, if not the main feature of the present exhibit, distinguishing it from all its predecessors, was the special display of wax models of plants showing the perfect development in conjunction with representation of the results of insect injury, and the enlarged models of some of the more important of the injurious and beneficial species. Most noteworthy in connection with the many plant models were those of Indian corn, cotton, and hop. These three plants were selected and elaborated because representing typical and leading American crops; the corn more particularly as the leading staple of the Northern Central States, the cotton for the Southern belt, and the hop as a leading industry of the Northeast and Northwest. They were all intended to illustrate and draw attention to the affecting insects displayed in connection with them, which purpose they served admirably.

The important models of injurious insects comprised the Hop Louse, Chinch Bug, and Oyster-shell Scale, each represented in all of their several stages. The beneficial insects were represented by models of the imported Australian Ladybird (*Tedalia cardinalis*), showing life-history; structural models of the domestic silkworm, moth and larva; and of the Honey Bee, all stages and economy. A similar anatomical model of the European Cockchafer was also exhibited. A further exhibit of useful insects was the showing of silk moths, the larvæ of which either now furnish an important article of daily necessity or may be capable of doing so, comprising a representation of the different stages, in some cases with silk, of 12 important native and foreign species.

More strictly appertaining to the National Museum were the displays in systematic and biologic entomology and miscellaneous exotic and native insects, comprising Section 2. The systematic and biologic series were represented by means of some 23 sample boxes taken from the national collection and indicating the actual present condition of the collections in different orders and the system followed by the curator in the disposition and arrangement of the material, and was intended for the edification of visiting entomologists, who would be interested in the standard national collections as much if not more than the special educational displays in the economic series for the general public. Here also may be classed the general insect display consisting of some 28 boxes filled with the striking insect forms of Central America, Venezuela, Honduras, and Brazil, much of the material for which was recently collected by Mr. H. H. Smith, and is undetermined and undescribed. It was found possible to secure this valuable collection out of the fund allotted for this Department, and by so doing at once greatly enrich the national collection in Central and South American insects, and secure material for the making of a showy exhibit to represent the beautiful and varied forms and colors assumed by insect life near the tropics. With this last, and serving a similar purpose, may be classed the display of Golden-rod insects, which was designed to appeal to the æsthetic taste of those who see or are interested in the beautiful aspects of nature's handiwork, rather than in practical applications in the arts and sciences. The vast number of insects that frequent the Solidago, either to breed on the different parts of the plant or merely attracted to its bloom, together with the great beauty of the plant itself and its wide distribution and distinctive American habitat, led to its special treatment. A very realistic model plant, in wax, served as a center about and on which to display its more characteristic or common insect frequenters.

The remaining sections of the exhibit were economic in character and pertained more strictly to the Department of Agriculture, and may be very briefly referred to. What has been termed the professional exhibit was a display of the diverse apparatus and methods for collecting, rearing, mounting, and preserving insects, including in all some 66 displays of different styles of butterfly, sweeping and water nets, collecting umbrellas, sieves, collecting and pinning forceps, collecting bottles and boxes, breeding cages or vivaria of all sorts; spreading, drying, and mounting apparatus; preservative and mounting substances, vial-holders, and insect boxes. The insecticides and apparatus for applying these to plants comprised of the former 120 and of the latter 125 exhibits.

A display was also made of the official entomological publications of the Department of Agriculture and the U. S. Entomological Commission, and some 129 frames of entomological illustrations, maps, charts, and bromide enlargements. These illustrations will probably become Museum property, and are for the most part in standard Museum frames. They include 69 plates of illustrations of insects made up from figures published in Prof. Riley's reports on the insects of Missouri, and from illustrations from the reports of the Division of Entomology, Department of Agriculture, and the U. S. Entomological Commission. There were also a series of ordinal charts representing classification and transformations; charts of important insect pests representing life history; maps showing range of leading insects; views of insecticide operations and insect ravages, and a series of bromide enlargements representing exterior and interior views of the insectary of the Department of Agriculture and interiors of the entomological rooms in the Department of Agriculture and National Museum.

A detailed catalogue of 121 pages, covering the entire exhibit of the Department of Agriculture, was issued in midsummer as Bulletin 51 of the Division of Entomology, and was distributed to interested visitors during the remainder of the Exposition. In it a full statement of the exhibits is given, and much information relative to them which could not be well displayed with the exhibits themselves. This was supplemented by the stationing of some member of the division force at Chicago from time to time during the summer to more fully explain the exhibit.

#### MARINE INVERTEBRATES.

The honorary curator, Dr. Richard Rathbun, on account of his responsibilities to the U. S. Fish Commission, has been unable to give more than a general supervision to the work of this department during the year, but substantial advances have been made. The number of accessions have been larger than usual, one of which will add a new and interesting feature to the display collection. Early in the year it again became possible to open the exhibition hall to the public, and while circumstances prevented any extensive improvement in the arrangement of the cases, the chief cause of interference in that matter, the preparation of material for the World's Columbian Exposition, will necessarily prove of great benefit in the future. The introduction of a new style of rectangular glass jar for the display of alcoholic specimens will also permit of the extension of the exhibition series in a very important direction.

Much progress has been made by Mr. Benedict and Miss Rathbun in their studies of the higher crustaceans belonging to the department, and several papers bearing upon these subjects have been completed for publication. Arrangements have also been made with three well-known authorities in Europe for the study of our large collections of foraminifera, hexactinellid sponges, and deep-sea deposits, and it is expected that the assistance of other collaborators will soon be secured, a result which is greatly to be desired, in view of the large amount of original material from recent explorations now contained in our store-rooms.

The accessions made to the collection number 56, an increase of 10 over last year. The most important one, from the standpoint of the

exhibition series, consists of a large number of beautiful preparations obtained by purchase from the zoological station at Naples, Italy. These will add an interesting feature to the display collection, as the specimens are chiefly soft and delicate organizations, which few have learned the art of preserving in a manner at all presentable to the general public. Many groups are represented. From the U. S. Fish Commission have been received the collection of actinians made during the voyage of the steamer *Albatross* from Norfolk to San Francisco, and described by Prof. J. Playfair McMurrieh, and a series of crustaceans resulting chiefly from recent explorations of the same vessel in the North Pacific Ocean.

Mr. W. L. Abbott has contributed a fine series of crustaceans, echinoderms, corals, and sponges from the Indian Ocean; Rev. H. Loomis, of Yokohama, crustaceans, echinoderms, and hydroids from Japan; Mr. Lewis Dexter, U. S. consul at Fayal, crustaceans, worms, and echinoderms from the Azores; Mr. H. R. Saunders, of Nassau, New Providence, 76 specimens of commercial sponges, representing the different Bahama grades; and Mr. Harlan I. Smith, many crayfishes and other fresh-water crustaceans from Ohio and Michigan. Other collections which also deserve mention here are specimens of crustaceans and leeches from the fresh waters of Mexico, presented by Mr. P. L. Jouy; crustaceans and worms obtained in Nicaragua by Mr. Charles W. Richmond; bird parasites from Mr. Walter Brett, of Lakeport, Cal.; blind crayfishes, including a new variety, from caves in Indiana, presented by Mr. W. P. Hay; microscopic slides of fresh-water crustaceans from Wisconsin, contributed by Prof. C. Dwight Marsh; crustaceans and worms collected in East Africa, from Mr. William Astor Chandler; and a number of starfishes and ophiurans from Canterbury Museum, Christchurch, New Zealand. While the remaining accessions are of smaller size than those above mentioned, containing only one or a few specimens each, they add altogether many interesting features to our collections.

The completion of the repairs in the west hall of the Smithsonian Institution during the summer of 1892 permitted the temporary coverings of the cases to be removed, and steps were at once taken to place the display collection in presentable condition, in order that the room might be reopened to the public. This was soon accomplished, but not without considerable work and a general overhauling of the specimens. At the beginning of the repairs, the large wall cases which surrounded the hall were boarded over and covered with a sloping metal top, which it was supposed would prevent the entrance of any moisture. Considering, therefore, that no harm could come to them, the stony and large gorgonian corals, the sponges, and some of the other groups were allowed to retain their places upon the shelves, as no other safe means of storing them could be provided. This supposed protection, however, proved entirely inadequate, and when the

eases were finally uncovered it was observed that much damage had been occasioned by the rain. The sponges and gorgonians were covered thick with mold, and the glue used to repair many of the branching stony corals had become softened, allowing the different pieces to fall apart.

Before winter the exhibition room had been restored to its previous condition, but any improvement or increase in the display collection had to be temporarily deferred in consequence of the necessity of beginning preparations for the World's Columbian Exposition at Chicago.

The renewal of alcohol on the large collection now possessed by this department, the cataloguing of new accessions, and the continuation of the card or systematic catalogue as specimens are identified, have occupied much of the time of Mr. Benedict and Miss Rathbun, and, notwithstanding the crowded condition of the storeroom, it can be said that the entire collection has been maintained in good condition throughout the year.

Not taking into account the very small organisms, which it is impossible to enumerate, the number of specimens received by the department has been 2,690. The entries made in the serial catalogue books have been as follows:

Group.	Entries to—		Number of entries during year.
	June 30, 1892.	June 30, 1893.	
Crustaceans .....	16,987	17,815	823
Worms .....	4,958	4,967	9
Bryozoans and Ascidians .....	2,869	2,887	18
Echinoderms and Coelenterates.....	17,759	17,858	99
Sponges and Protozoans.....	6,315	6,326	8
Total .....			962

Mr. Benedict, the assistant curator of the department, has continued during the year his work upon the large family *Paguridae*, or hermit crabs, of which he is preparing a complete monograph, the same being now well under way. He has also spent much time in a study of the larger forms of anomura of the Pacific Ocean, belonging to other groups than the above, and has classified the sponges recently collected in the North Pacific, by a microscopic examination of their spicules, in order that the different groups may be sent to specialists for study.

The following papers by Miss Rathbun, completed during this period, have been submitted for publication in the Proceedings: "Catalogue of the Crabs of the family *Maidae* in the U. S. National Museum;" "Descriptions of new genera and species of crabs from the west coast of North America and the Sandwich Islands," based chiefly upon material recently collected by the steamer *Albatross*; and "Descriptions of new species of American fresh-water crabs." She has also completed the identification of the collection of *Brachyura* made in the

Pacific Ocean and Bering Sea by the steamer *Albatross* since the spring of 1888, with the object of preparing a catalogue of the same, having special reference to the fauna of the fishing grounds, for publication by the Fish Commission.

The following specimens have also been identified, namely, the Abbott collection of crabs from the Indian Ocean, the invertebrates from Japan, contributed with a request for names by Rev. H. Loomis, both mentioned among the accessions, and a collection of crustaceans belonging to the Provincial Museum of Victoria, British Columbia, transmitted for examination and report.

The sponges belonging to the family *Hexactinellidae*, collected in the Pacific Ocean by the steamer *Albatross*, have been sent to Prof. F. E. Schulze, of Berlin, the well-known authority on this subject, who is now preparing a complete revision of the group. He will also submit a special paper for the Museum Proceedings, describing the specimens supplied from here. Similar arrangements have been made with Dr. Axel Goës, of Sweden, to work up the foraminifera collected by the same vessel in the Gulf of Mexico, Caribbean Sea, and Pacific Ocean; and with Dr. John Murray, of Edinburgh, Scotland, to study the deep-sea deposits obtained by the *Albatross* and other United States vessels. The collections have accordingly been shipped to them. These same experts reported upon the corresponding subjects in the extensive series of volumes covering the results of the voyage of H. M. S. *Challenger*, and the Museum is therefore fortunate in securing their cooperation at this time.

Prof. Walter Faxon, of the Museum of Comparative Zoology at Harvard University, has continued to identify the crayfishes received from time to time by this department, and Dr. C. W. Stiles, of the Agricultural Department, has undertaken to study the intestinal parasites, which have now been set aside for his examination.

The Fish Commission steamer *Albatross* has been employed during the past year chiefly in connection with the sealing investigations in the North Pacific Ocean and Bering Sea, but she has also had the opportunity of doing some dredging work in the same region, from which important collections of natural history were obtained. Some of these have already been turned over to the National Museum. The natural-history work of the steamer *Fish Hawk* has been confined mostly to the oyster beds of Long Island Sound and Chesapeake Bay, and that of the schooner *Grampus* to surface towing and fishing off the New England coast, and to an investigation of the habits of the mackerel during the spring migrations. Mr. Benedict took part in the examination of the oyster beds in Long Island Sound, and through his own efforts was enabled to secure a much larger series of the smaller animals desired by the Museum than would otherwise have been obtained.

The duplicate specimens belonging to the regular Series No. IV,

which have been distributed to institutions of learning during several years past, are now nearly exhausted, only a few sets still remaining. The following schools and colleges were supplied during the year: State Normal School, Oshkosh, Wis.; Clark University, Atlanta, Ga.; Columbia College, Van Alstyne, Tex.; Grammar School, Salem, Mass. A large general collection of marine invertebrates, representing mainly the dredging work of the Fish Commission, was also sent to the Imperial University, Moscow, Russia, and smaller collections were distributed as follows: Anomuran crustaceans to the Museum of Comparative Zoology at Harvard University; hermit crabs to Leland Stanford Junior University and the University of California; miscellaneous specimens to Clark University, Atlanta, Ga.; University of Georgia, Athens, Ga.; Normal School, Hampton, Va.; and Miss Mary V. Worsell, New York City; two species of sea urchins to Prof. Cuénot, Nancy, France; edible crustaceans to the Museum of Hygiene, Washington, through Dr. Howard E. Ames, U. S. Navy; echinoderms to Prof. A. J. Woolman, South Bend, Ind.; foraminifera to Smith College, Northampton, Mass., and Prof. E. R. Boyer, Englewood, Ill.

Collections were also sent to the following authorities for study and report, as mentioned elsewhere: To Prof. F. E. Schulze, Berlin, Germany, the hexactinellid sponges collected by the steamer *Albatross* in the Pacific Ocean, between 1887 and 1890; to Dr. Axel Goës, Linköping, Sweden, a large collection of foraminifera from the Caribbean Sea, Gulf of Mexico, and Pacific Ocean, obtained mostly by the steamer *Albatross*; to Dr. John Murray, Edinburgh, Scotland, a large series of deep-sea soundings, representing the character of the bottom in different oceans, and collected by the steamer *Albatross* and other exploring vessels of the United States; to Prof. Walter Faxon, Cambridge, Mass., the specimens of crayfishes recently received by the Museum.

The exhibit from this department at the World's Fair consisted of a synoptic series, showing by means of specimens, models, drawings and explanatory labels; important forms and anatomical details of the orders of invertebrates, contained in the groups *Protozoa*, *Porifera*, *Cœlenterata*, *Vermes*, and *Echinodermata*.

Marine invertebrates. A systematic series of specimens of marine invertebrates in alcohol, including representatives of 125 families, of the following classes: *Spongia*, Sponges. *Anthozoa*, Coral Polyps. *Polypomedusa*, Hydrozoa. *Crinoidea*, Sea Lilies. *Asteroidea*, Star fishes. *Echinoidea*, Sea Urchins. *Holothuroidea*, Sea Cucumbers. *Annelida*, Worms. *Crustacea*, Crabs, Shrimps, etc. *Bryozoa*, Moss Animals. *Tethyodea*, Ascidians. *Arachnida*, Sea Spiders.

A collection of marine invertebrates in alcohol, from the Bay of Naples, received from the Naples Zoological Station.

Mediterranean Octopus, a group, with accessories, representing the Octopus in its natural surroundings.

A series of economic marine invertebrates and of other specimens illustrating the principal features of the fishing grounds was likewise withdrawn by the Fish Commission for the same purpose. Mr. Benedict



was in Chicago during about four weeks in April and May, arranging the collections sent by this department, and otherwise assisting in the preparation of the National Museum exhibit.

DEPARTMENT OF COMPARATIVE ANATOMY.

The time of the acting curator, Mr. F. A. Lucas, has been chiefly spent in the preparation and installation of material for the World's Columbian Exposition and in preparing copy for the numerous labels, especially the somewhat lengthy descriptive labels for that portion of the synoptic series of invertebrates there shown.

There have been few important accessions, the most noteworthy being a comparatively complete skeleton of the extinct Steller's Sea Cow (*Rhytina Stelleri*), received through the instrumentality of Prof. B. W. Evermann, of the U. S. Fish Commission. Dr. W. L. Abbott sent 4 skeletons of cetaceans (*Prodelphinus*) from the Indian Ocean, and also a fine example of the Aldabra Tortoise (*Testudo elephantina*). An important series of skulls of African mammals, collected by Mr. H. C. Moore, is mentioned in the report of the curator of mammals. A fine old male Mountain Goat (*Mazama americana*) was procured from Mr. Allen Rupert.

A series of Sandwich Islands birds in spirits was secured by purchase and gift from Mr. Scott B. Wilson, and it is hoped that a study of these may throw a little light on the relationship of the avifauna of those islands.

Attention has been given to filling up gaps in the exhibition series, the additions being forms representing families, or important divisions of families. The general exhibition series of mammal skeletons is now fairly full, but few important forms being needed, while a limited number of pieces might perhaps be withdrawn. Many additions are necessary to the series of birds, while the collection of skeletons of fishes is very incomplete. The number of mounted skeletons is designedly restricted, as the distinctive features of various groups can be more clearly shown by a moderate than by a large number of specimens. On the other hand, the study series can not be too large, for only by large series of specimens can the relationships of species and the amount of individual variation be determined.

Among the series supplementing the general collection of skeletons, and illustrating various points of anatomy and morphology, that showing the homologies of the principal bones was completed for the Chicago Exposition.

Among the projected series is one showing some of the modifications of the skeleton for offense or defense, one to illustrate the morphology of the hyoid and branchial arches, and one to show the relations of the bones of the ear.

- Work on the study series has been mainly confined to such rearrangement of material as has been rendered necessary by the steady growth

of the collections. Owing to the lack of storage room it frequently happens that specimens are temporarily placed wherever space can be found for them and rearranged when room can be made available.

Mr. Lucas has been unable to devote any time to special researches, but the skulls of bears and of fur seals have been carefully studied by Dr. C. Hart Merriam, the latter in connection with the presentation of the case of the United States in the Bering Sea question.

The curator submits the following statement of the condition of the collections:

The condition of the collections is good; the increase, as indicated by the catalogues, is as follows:

	Last entry—		Increase.
	June 30, 1892.	June 30, 1893.	
Mammals.....	35,526	36,051	525
Birds.....	19,105	19,185	80
Reptiles and Batrachians.....	29,325	29,340	15
Fishes and Elasmobranches.....	26,149	26,159	10
Total.....			630

The number of specimens on exhibition June 30, 1893, was as follows:

Skeletons of—		
Mammals.....		196
Birds.....		83
Reptiles.....		41
Batrachia.....		9
Fishes.....		37
Elasmobranches.....		3
Skulls and specimens illustrating points of morphology, structure, etc.....		292
Anatomical models.....		25
Total.....		686

This total included museum specimens withdrawn for exhibition at the World's Columbian Exposition, but not those which have been purchased especially for that purpose.

In the World's Fair exhibit from this department an effort has been made to illustrate the methods adopted by the Museum to render the exhibition of anatomical material instructive and attractive. To this end the material exhibited comprised several fully labeled series, illustrating various points of morphology or structure, grouped under the following heads:

(1) HOMOLOGIES OF THE PRINCIPAL BONES IN THE VARIOUS CLASSES OF VERTEBRATES.

(a) *General homologies.*—Mounted skeleton of a man and a horse\* having the principal bones of each labeled. Mounted and disarticulated skeletons of cat, crow, turtle, iguana, frog, and fish arranged in cases side by side, the disarticulated skeletons having the principal bones

\* Illustrated in Plate 30.

labeled, thus rendering it possible to recognize the corresponding bones of each almost at a glance.

(b) *Special homologies; the skull.*—Skulls of sturgeon, gar pike, grouper, menopoma, frog, boa constrictor, turtle, alligator, penguin, goat, and puma, having the corresponding bones similarly colored. While this plan is not new, special attention was given to securing a harmonious color scheme, and the smaller skulls were represented by accurately enlarged models, thus showing details that would otherwise have been invisible.

(c) *Special homologies; the limbs.*—Articulated limbs of grouper, sea turtle, alligator, eagle, and dog, having the larger bones labeled and the smaller bones numbered, the specimens being accompanied by correspondingly numbered labels giving the names of the various bones of the wrist and ankle. Limbs of fish, sea turtle, manatee, cormorant, great auk, sloth, bat, monkey, and man, showing the homologies of limbs specially modified for various methods of locomotion. Manus and pes of a horse, camel, moose, tapir, seal, bear, and lion, with the larger bones labeled and the smaller numbered alike, intended to make clear the correspondence of parts in mammals having from 1 to 5 digits.

#### (2) LOCATION, GROWTH, AND STRUCTURE OF TEETH.

Series of skulls of mammals, reptiles, and fishes, exhibiting the teeth in various stages of growth, many having the outer surface so cut away as to show the young teeth not yet in place. Specimens illustrating the mode in which the teeth are replaced in some animals, and single teeth, or sections of teeth, displaying the varying proportions and disposition of the dentine, enamel, and cement, as well as some of the simpler and some of the more complicated patterns of tooth structure.

#### (3) STRUCTURE AND GROWTH OF HORNS.

Examples of horns which are merely outgrowths of the epidermis, as is the case in the rhinoceros; those which are permanent outgrowths of the frontal bones covered with hard epidermal structures, such as are found in sheep, goats, and oxen; and those which, as in the deer, are outgrowths of the frontal bones and are grown and shed annually. Sections of these various classes of horns are shown also.

#### (4) STRUCTURE OF THE LONG BONES.

A series of bisected humeri and femora exhibiting the light, hollow, structure of the long bones in animals of rapid movement, and the more or less dense character of the limb bones of aquatic animals or those of sluggish movements.

#### (5) STRUCTURAL VARIATIONS OF DOMESTIC ANIMALS.

Series of skulls of dogs, showing something of the cranial variations in different breeds. Series of skeletons illustrating the more marked

differences in size and proportions among domestic dogs. Casts of brain cavities of wolf, fox, and dog, exhibiting the greater frontal development of the latter.

(6) ANATOMY, EMBRYOLOGY, AND VARIATION OF THE DOMESTIC FOWL.

(a) *Anatomy*.—Skeletons of different breeds. Model displaying muscles, blood vessels, and viscera.

(b) *Embryology*.—Model of genital organs of hen. Sixteen models, some enlarged to give details, showing various stages in the development of the fowl from the beginning of incubation to the newly hatched chick.

(c) *Variation*.—Wild jungle fowl, the stock from which the various breeds of domestic fowls have been derived. Mounted examples of several breeds to illustrate the marked differences of proportions, size, and color among domestic fowls.

(7) COMPOSITION OF THE HUMAN BODY.

Series of specimens and models showing the various elements and their proportions in the body of a man weighing 150 pounds.

This department was also charged with the preparation of the exhibit of domesticated birds, which are shown in two series:

(1) DOMESTIC PIGEONS.

Series of 34 specimens, including an example of the Wild Rock pigeon, grouped about a dovecot, and used to illustrate variation under domestication. The following races and breeds are represented:

*Pouters*.—Red; Blue; Isabella Pigmy Pouter.

*Carriers*.—Black Barb; Dun Carrier; Blue-rock Carrier.

*Tumblers*.—Booted White English Fantail; Blue-tailed Turbit; Yellow-winged Turbit; Yellow shell-crested Turbit; White Owl; Turbiteen; Black Tumbler; Red Parlor Tumbler; Black Bald Tumbler; Black Jacobin; Blulette; Salinette.

*Trumpeters*.—Common pigeons; Homers; Red-winged Swallow; Barred Blue-winged Swallow; Nun; Helmet; Archangel; Ice pigeon; Black Magpie; Yellow Magpie; Russian Trumpeter.

(2) BREEDS OF THE DOMESTIC FOWL.

*American breeds*.—Plymouth Rock, cock and hen; Black Java, cock and hen; Silver Wyandotte, cock and hen; Jersey Blue, cock and hen.

*Asiatic breeds*.—Light Brahma, cock and hen; Black Langshan, cock and hen; Partridge Cochin, hen; White Cochin, cockerel.

*English breeds*.—Silver-gray Dorking, cock and hen; White Dorking, cock and hen.

*Hamburghs*.—Silver-spangled Hamburgh, cock and hen.

*French breeds*.—La Fleche, cock and hen.

*Games.*—Red Pile Exhibition Game, cock and hen; Maroon Game, cock; Black Sumatra Game, cockerel and pullet.

DEPARTMENT OF INVERTEBRATE FOSSILS (PALEOZOIC).

The honorary curator, Mr. C. D. Walcott, has been obliged to devote his time almost exclusively to work connected with the U. S. Geological Survey. The department cooperated with the Survey in the preparation of an exhibit for the World's Columbian Exposition. Such time as could be spared to laboratory work was given to the preparation of a collection to be exhibited at the World's Columbian Exposition. A description of this exhibit is given at the close of this report.

The year's work upon the collections was mainly in the direction of working out and putting in condition for study the collections that had previously been made by the Geological Survey. Over 200 drawers of Upper Cambrian fossils have been worked up, preparatory to study in connection with the preparation of a monograph on the Upper Cambrian fauna. A large number of Middle Cambrian fossils were received from the field, cleaned, and record numbers entered upon them. None of this material, however, was transferred to the National Museum, as I thought it desirable to complete the study of the same before transmitting it.

In the laboratory, attention was given to painting the record numbers on the specimens belonging to the accessions, and to the recording of material which will be transferred from the Geological Survey as soon as the work upon it is completed.

The publications of the year based on Museum material are noticed in the Bibliography.

The catalogue numbers taken up were from 24153 to 24311, both inclusive. About 1,200 specimens have been added to the collection.

Owing to the pressure of other work, a number of the recent accessions to the Museum exhibition series have not yet been entered, but special instructions have been given to attend to this matter early in the next fiscal year.

Among the most interesting additions were the collections made by Mr. Walcott. One hundred and fifty specimens of fossils of the Oriskany formation, at Cumberland, Md., and 100 specimens of Lower Devonian corals, from Genesee County, N. Y., from the Geological Survey. Also a large collection of 325 individual crinoids, together with 12 magnificent crinoid slabs from the Lower Carboniferous at Crawfordsville, Ind., from Charles E. Beecher, Yale College, New Haven, Conn. Dr. A. L. Benedict, of Buffalo, N. Y., sent 24 specimens of fossils characteristic of the water-limestone of Buffalo, and L. W. Stuart, Monmouth, Iowa, a considerable collection of Niagara fossils from Monmouth, Iowa.

It was decided that the Museum should unite with the U. S. Geological Survey in the preparation of a paleontological exhibit for the World's Columbian Exposition. A large number of specimens belong-

ing to the Survey were used for this purpose, and a number came from the collections of the Museum. All of the material has now, however, been transferred to the custody of the latter, and is now on exhibition in the Department of Geology.

The principal feature of the exhibit was the collection of characteristic fossils and rocks arranged stratigraphically. This contained about 1,850 species (probably 6,000 specimens) of fossils, and 543 rocks. There were also exhibited a restored skeleton of *Diuoceras mirabile*, 4 large slabs with *Lingula*, *Protichnites*, *Climactichnites*, and *Dactyloidites*, 2 large casts of *Orthoceras*, 1 large specimen of *Baculites grandis*, 1 large special case containing showy specimens of Crinoids, Trilobites, Eurypterus, Ammonites, Corals, etc., and 2 special cases of showy fossil plants, principally Carboniferous, with a few from the Cretaceous and Tertiary.

#### DEPARTMENT OF MESOZOIC FOSSILS.

Comparatively little work has been done in this department during the past year. Owing to the fact that its personnel is only nominally or incidentally connected with the Museum, it has been impracticable to devote much more time to it than the most imperative of the routine forms required. This work has been mainly confined to the examination of and report upon accessions, and to the transference of certain collections to the Museum from the U. S. Geological Survey.

The most important accessions to the Museum through this department are those received from the Survey. Among these are the type specimens of fossils which have formed the basis of Bulletin No. 106 of the Geological Survey, of which Mr. T. W. Stanton is the author. This collection embraces 179 type specimens, all of which are figured in that bulletin.

During the past year the entries in the record book of this department have ranged from 22,170 to 22,959. There have been catalogued 6,440 specimens of fossils, 5,392 of which came from the U. S. Geological Survey, and 1,048 from all other sources.

Dr. C. A. White, the honorary curator, has during the past year been engaged in the preparation of a work upon the Bear River formation of Wyoming and Idaho, which is largely of a paleontological character. This work is not yet published, and no work based upon the collections of this department has been published during the year.

#### DEPARTMENT OF RECENT PLANTS.

Dr. George Vasey, honorary curator and botanist of the Department of Agriculture, died March 4, 1893, after a long and faithful service in connection with the National Herbarium and with the U. S. Department of Agriculture.\* Mr. Frederick V. Coville, his successor,

\* Notices of his life and scientific work have been published in the Bulletin of the Torrey Botanical Club, vol. 20, 1893, pp. 218 to 220, and in the Botanical Gazette, vol. 18, 1893, pp. 170 to 183.

was appointed honorary curator of the Department of Botany in the National Museum, March 28, 1893.

During the past year, up to the time of his death, Dr. Vasey was engaged upon researches in connection with a publication entitled "Monograph of the Grasses of the United States and British America," basing his work upon the very full collection of Gramineae in the National Herbarium. The work on this subject was about four-fifths completed at the time of Dr. Vasey's death. The report on the botany of the Death Valley expedition, in preparation by Mr. Frederick V. Coville, was also continued during the first part of the present year and was finished in December, 1892. Work on the collections made by Dr. Edward Palmer in western Mexico during the years 1890 to 1892 was continued by Dr. J. N. Rose.

The Herbarium collection, which is deposited in the Department of Agriculture, consists of study and duplicate series only, no specimens having been prepared for exhibition purposes. In general the herbarium is in excellent condition, the system of classification being so carried out as to greatly facilitate access to the material contained in it.

During the year about 33,000 specimens were received, involving 567 catalogue entries. Specimens to the number of 14,308 were sent out as exchanges, and 4,117 mounted sheets were added to the Herbarium proper.

Mr. Coville reports as follows upon the important accessions received during the year:

A large collection of specimens from northwestern Idaho, collected by Dr. J. H. Sandberg and assistants. The whole collection contains 1,035 numbers.

A collection of 168 numbers from Yakutat Bay, Alaska, made by Frederick Funston during the summer season of 1892. These specimens are in excellent condition and excel in their value as specimens any collection heretofore received from Alaska.

Dr. Edgar A. Mearns, captain, U. S. Army, has continued to send in collections made upon the International Boundary Commission (United States and Mexico), which, although not yet critically examined, will furnish material for a future report on the botany of this region.

Dr. H. E. Hasse of Soldiers' Home, Los Angeles County, Cal., has contributed a set of 255 specimens from the southern portion of the State of California.

Mr. G. C. Nealley has continued his collections in Texas, having sent in about 1,650 specimens from that State.

Through Mr. P. A. Rydberg have been received a valuable collection from the Black Hills of South Dakota, containing about 2,500 specimens.

From Dr. Edward Palmer has been received a collection of specimens from middle California in the vicinity of San Francisco Bay, and in the Sacramento and San Joaquin valleys.

From Mr. J. W. Toumey, of Tucson, Ariz., was received a series of specimens collected on a journey from Tucson northward past San Francisco mountain to the Grand canyon of the Colorado and return.

From Dr. E. F. Franchesci was purchased a collection of 214 plants from Attica, Greece, the specimens in by far the best condition of any yet received from Europe.

From Mr. John Macoun, Ottawa, Canada, was purchased a set of 100 Canadian lichens and 100 Canadian mosses.

From Prof. C. S. Crandall, Fort Collins, Colo., has been received a collection of 587 Colorado plants.

From Mr. G. W. Letterman, of Allentown, Mo., was received a small but interesting and valuable collection consisting of 71 grasses of the genus *Poa*, collected at high altitudes in the Rocky Mountains of Colorado.

From C. G. Pringle, of Charlotte, Vt., was purchased a collection of his plants of 1892 from southern Mexico.

From Dr. Franz Buchenau, of Berlin, Germany, was received a collection of 164 specimens of the genus *Juncus*.

From Dr. H. H. Rusby, of New York City, a set of Miguel Bang's Bolivian plants was received.

Fascicles 8 and 9 of Mr. W. N. Suksdorf's collections made in the State of Washington have been acquired by purchase.

M. C. Copineau has sent in 260 specimens of French plants as an exchange.

From Dr. B. L. Robinson was secured a set of 420 specimens collected by the late Mr. H. E. Seaton, of Cambridge, Mass., on Mount Orizaba, Mexico.

In addition the first installments of several collections have been received from collectors which are more properly mentioned, together with the remainder of those collections, in the report for the succeeding year.

Through the Smithsonian Institution has been received from M. S. E. Lassimonne, of France, a collection of 200 specimens of plants from that country.

From Baron Ferdinand von Mueller, Melbourne, Australia, have been received several packages of Australian plants, in most cases new to the Herbarium.

From Miss Elizabeth Taylor, of Troy, N. Y., were received a set of 115 specimens collected by herself in a journey down the McKenzie River, British America, during the season of 1892.

From the U. S. Fish Commission was received a package of 650 specimens from the mainland and islands of Alaska, collected by Dr. B. W. Evermann.

In addition to these specimens many others, small in number but no less valuable in quality, have been received and incorporated in the Herbarium.

#### DEPARTMENT OF FOSSIL PLANTS.

The work of the year has been a continuation of that of the two preceding years, that is, the object kept constantly in mind has been "the arrangement of the specimens in such a manner as to facilitate their consultation and study."

Prof. Lester F. Ward, of the Geological Survey, continues his services as honorary curator, and Prof. F. H. Knowlton was reappointed assistant curator of this department in August. He was, however, only able to devote one-half of the time to this work for several months, but since December his whole time has been given to the Museum. Later by an arrangement made between the National Museum and the U. S. Geological Survey, Prof. F. H. Knowlton exchanged work with Mr. David White. The actual period of this exchange extended from November 28 to June 27. During this period Prof. Knowlton continued the revision of the flora of the Laramie group, mentioned in my last report, and at the end of the year he had settled the status of 241 species and had written about 450 pages of the preliminary manuscript. He has had prepared a large number of drawings to illustrate the new species, or those possessing peculiar or curious features. The work thus far accomplished



represents all but about 25 of the species recorded in Lesquereux's Tertiary Flora. The whole flora of this group, as now known, will probably embrace about 350 species, and when completed it will represent, it is thought, one of the most satisfactory aids to geology that has been afforded.

Mr. White's work for the Museum has been entirely on the great Lacle collection, and at the end of the year about 125 boxes, weighing 15,000 pounds, had been shipped to Washington. As the magnitude and value of this collection was stated at length in the report for last year, it is unnecessary to again refer to it. The larger part of this donation has now been labeled and sent to Washington, but much remains, especially in the way of duplicates. It is probable that a further arrangement will be perfected whereby Mr. White will be enabled to complete the transfer.

No especially important accessions have been made during the year, the lots received being either single specimens or small collections from limited areas. The Museum has, however, obtained by purchase a very fine series of fossil cycadean trunks from Lower Cretaceous strata near Hot Springs, South Dakota. They are six in number, and range from 10 inches in length and 6 inches in diameter, to over 3 feet in length and 2 feet in diameter. The finest specimen, which weighs 721 pounds, is undoubtedly the largest example of the kind ever found. The specimens have been photographed in various positions, and will be made the subject of a special monograph.

The routine work in arrangement and classification of the collections has been of the same nature as in several previous years. We had constructed in the west tower-room a large storage-case, capable of accommodating about 500 3-inch unit trays. The entire miscellaneous Carboniferous collection, which is being studied by Mr. White, was put in this case, and the room on the balcony floor reserved for the Mesozoic and Tertiary plants. Five quarter-unit table cases were also placed in the west tower room, and the whole collection of fossil wood was placed in them. At the present time everything in the department is perfectly accessible. This condition is only brought about, however, by storing in the Armory building all that can not be accommodated in the cases. This arrangement, while probably the best that the present division of space will admit of, often causes serious inconvenience, as collections or specimens desired for study or comparison are in storage. When the great Lacle collection is installed, the need of additional space will be much greater than now.

Prof. Ward's work during the year has been practically a continuation of that recorded as in hand in his last report. He has continued the exploration of the Potomac formation, both in the immediate vicinity of Washington and below Richmond, Va., with the result of discovering a number of new plant beds, from which a large number of new and interesting plants were obtained. The specimens from the Potomac

formation, exclusive of those on which Prof. Fontaine based his monograph on the Younger Mesozoic Flora of Virginia, now fill 113 of the standard unit trays of the National Museum. These later specimens have come from Alabama, Virginia, the District of Columbia, Maryland, and New Jersey, and, combined with the earlier ones, make probably as complete a flora as that known for any formation. The results of their study will be embodied in a work on the correlation of the Cretaceous plants, now in preparation.

Besides the work of revision above mentioned, Prof. Knowlton has also studied collections and made reports as follows: Re-examination of the fossil plants at Silver Cliff, Colo.; list of the plants of the Post-Laramie beds of Colorado; report on a collection of fossil plants from Ellensburg, Wash.; report on fossil plants obtained by J. S. Diller in western Washington; report on two species of fossil plants from Oregon; identification of a collection of fossil plants from the auriferous gravels of California, obtained by H. W. Turner; report on the bearing of the fossil plants of the auriferous gravels on the question of the temperature and elevation at the time of their deposition; determination of fossil plants collected by W. H. Weed in the Crazy Mountains on Big Timber Creek, Park County, Mont.; report on collection of fossil plants from Cookville, Utah; report on fossil plants from Huefano Park, Colorado, as well as numerous reports relating to accessions received by the Museum.

Prof. William M. Fontaine, of the University of Virginia, has studied and made an elaborate report on a collection of plants from the Trinity rocks near Glen Rose, Tex. He has determined no less than 23 species, of which number 6 are new to science. His paper, illustrated by 8 plates, is published in the proceedings of the National Museum.

The last catalogue entry in June, 1892, is 555.

The last catalogue entry in June, 1893, is 584.

Total number of specimens added to the collection during the year is estimated at 2,000.

#### DEPARTMENT OF MINERALS.

Prof. Clarke reports that apart from the usual routine little was done in the department except to prepare, pack, and install its share of the exhibit made by the Museum at the World's Columbian Exposition. To that work all else was subordinated. The preparation of the crystallographic series for Chicago, by Mr. W. S. Yeates, involved the careful measurement and description of a large number of characteristic crystals, representing many mineral species. The data thus obtained appear upon the printed labels of the specimens, which have thus acquired new value for the permanent collection. Toward the end of April Mr. Yeates went to Chicago to install the collection; but early in May he resigned as assistant curator, to become State geologist of Georgia, and the work of installation was completed by Mr. Wirt Tassin and the Curator. The collection shown at the Exposition filled 2

Liverpool cases and 4 slope-top cases, and consisted entirely of choice, selected characteristic material. For the time being, of course, the exhibition series in Washington was perceptibly weakened.

During the year 348 entries were made in the catalogue of the department, representing 579 specimens. Of these a considerable number were bought with reference to exhibition at Chicago, especially a fine group of representative gems from Amelia County, Va., a superb series of crystallized sulphurs from Sicily, and a suite of anglesite crystals from Montepioni, Sardinia. Some remarkable Sicilian selenites and celestites, and the groups of fluorites from the Wilcox collection were also obtained in this way.

By gift, little was received during the year. The most notable accession of this kind was a series of 7 cut turquoises and 1 specimen of turquoise in the matrix, presented by the American Turquoise Company, of New York. The exchanges also were few in number. Sixteen specimens of miscellaneous minerals were thus obtained from Mr. E. E. Howell, and 51 specimens, all of European origin, were received from Prof. P. Groth, of Munich, in return for a collection previously sent to him. Still another exchange collection came from Prof. A. Brezina, of Vienna, but it was not catalogued during the year covered by this report.

When the collections now in Chicago shall have been returned to Washington, the incorporation of the new material obtained into the permanent series will involve a general reorganization of the exhibition hall. Much old material will be retired to the study and duplicate series, to make room for new and finer specimens. Until that work has been done, no satisfactory census of the mineral collection can be made.

The last catalogue entry of the preceding year, June 30, 1892, was No. 80640. The last entry of the present year, June 30, 1893, is No. 80991.

#### EXHIBIT OF MINERALS AT THE WORLD'S COLUMBIAN EXPOSITION.

The exhibit consisted of minerals, gems, and semi-precious stones, illustrating the principles of crystallography and those physical properties of minerals which apply to the eye, and included the following series:

Crystallography and the physical properties of minerals.

A series of crystallized minerals (with the principal forms in models of wood) to illustrate crystal form.

A series to illustrate parallel growths.

A series to illustrate the twinning of crystals.

A series to illustrate the imperfections of crystals.

A series of crystalline aggregates.

A series of pseudomorphs.

A series to illustrate structure.

A series to illustrate cleavage and fracture.

A series to illustrate diaphaneity, color, and luster.

A collection of gems and semi-precious stones, embracing two series, as follows:

A general series, arranged in the order of their intrinsic value.

A series of American gems and semi-precious stones.

## DEPARTMENT OF GEOLOGY.

A very large portion of the year was devoted by Prof. George P. Merrill, the curator, and his assistants, to the preparation of an exhibit for the Columbian Exposition, a general outline of which was given in the curator's report for 1892. Lack of space necessitated a certain amount of curtailment in the original plans, but as carried out the exhibits were classified and arranged as below:

## I. VULCANOLOGY.

(a) A map of the world showing in red the distribution of active and recently extinct volcanoes, compiled mainly from Meumayer's *Erdgeschichte*.

(b) A geological map of the United States showing in red the areal distribution of recent volcanic rocks in the United States, compiled by Prof. C. H. Hitchcock, in 1886, and published in the *Transactions of the American Institute of Mining Engineers*.

(c) A model of the Ice Spring Craters, a group of recently extinct volcanoes near Fillmore, Utah, modeled from surveys made under the direction of the U. S. Geological Survey; scale, 100 feet to 1 inch, horizontal and vertical the same; size of model, 5 feet square.

(d) A large series of photographs showing characteristic volcanic phenomena, as below:

(1) Two enlarged views of the volcano on Bogoslof Island, Bering Sea.

(2) A series of views of Bogoslof and mounts Shishaldin and Maku-shin, in Alaska.

(3) A series of views of Hawaiian volcanoes and lava flows.

(4) A series of views of Vesuvius, Italy, and the volcanoes of the adjacent islands, including Stromboli, Etna, and Vulcano, in various stages of volcanic activity.

(5) Views of a recent volcanic cone and lava fields near Snag Lake, California.

(6) Three views of the grand volcanic neck known as Mato Teepee, Bear Lodge, or the Devil's Tower, in Wyoming.

(7) Views of columnar volcanic rocks in the Yellowstone National Park, in the vicinity of Orange, N. J., and at Bonn, Prussia.

(8) Views of geysers and hot springs in the Yellowstone National Park.

(e) A series of specimens of volcanic products in characteristic forms, as lavas, fragmental ejectamenta, and sublimation products, as follows:\*

(1) Columnar basalt, from Bonn, Prussia, and the Giant's Causeway.

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\* These collections were accompanied, whenever possible, by photographs of the immediate regions from which they were collected.

(2) Slaggy and glassy lava, from the Hawaiian Islands and the Yellowstone National Park.

(3) Pumiceous and glassy lavas (obsidians), from the Yellowstone National Park and the Mono craters, California; vesicular lava, from near Flagstaff, Ariz.

(4) Lava showing the aa, pahoehoe, and other structures dependent upon their varying degrees of viscosity; lava stalactites and dribble cones from the Hawaiian Islands.

(5) Volcanic bombs, from Lipari, Etna, the extinct volcanoes of Mount Trumbull and Sunset Peak, Arizona; lapilli, from Ice Springs Buttes, in Utah, and Sunset Peak, Arizona.

(6) Sand, rock fragments, ash, etc., from Bogoslof Island.

(7) Fine pumiceous dust, from beds in Montana and Nebraska.

(8) A series comprising 40 hand specimens illustrating the various kinds of lavas, and also 2 large specimens of polished paleozoic lava (felsite), from eastern Massachusetts.

(9) Volcanic sublimation products, including sulphur, ammonium chloride and iron oxides from various American and foreign sources.

(10) Siliceous and calcareous sinters from the geysers and hot springs of the Yellowstone National Park, and travertines from extinct hot springs in Arizona. The possible economy of volcanoes was illustrated in the sulphur and other sublimation products, pozzuolani (a natural concrete) building-stone, and the beautiful "onyx marbles" or travertines.

## II. GLACIERS AND GLACIAL PHENOMENA.

(a) Views illustrating living glaciers and icebergs.

(b) A relief map of the United States, showing the theoretical restoration of the ancient ice sheet at the stage of the Glacial period following the Main Silt epoch.

(c) A large series of photographs and other illustrations showing characteristic glacial phenomena, as below:

(1) Views of glacial deposits, as moraines, drumlins, and kames.

(2) Views of large drift boulders the source of which has been traced with approximate accuracy.

(3) Views of glacial rock surfaces.

(d) Actual specimens illustrating the transporting and eroding power of glaciers, as:

(1) Specimens of glacial clays, sands, and drift boulders. Of particular interest in this series are boulders taken from various altitudes in the White and Catskill mountains, and boulders of peridotite and other rocks in Rhode Island, Ohio, and Illinois, the original source of which is known with approximate accuracy.

(2) Scratched and scarred boulders from glacial till.

(3) Scratched and scarred boulders from glaciers still existing.

(4) Glacial flour.

- (5) Slabs of stone, grooved, scratched, or polished by glacial action.
- (6) The possible economy of glacial products as shown in the utilization of glacial boulders for building, and the glacial clays for brick-making.
- (7) The destructive effects of glaciation, as illustrated by fields covered by drift boulders and other glacial debris, the stripping of the surface of soils, and the burial of forests; shown by photographs only.

### III. LIMESTONE CAVERNS AND ASSOCIATED PHENOMENA.

(a) Actual plans and sections of Howe's Cave, N. Y.; the Luray Caves, Va.; Mammoth Cave, Ky., and Wyandotte Cave, Ind.

(b) A series of photographs showing cave interiors, as follows: Howe's Cave, N. Y.; the Luray Caves, Va.; The Grottoes, Va.; Mammoth Cave, Ky.; Wyandotte and Marengo caves, Ind.

(c) A large series of cave deposits as below, many of the stalactites and stalagmites being cut and polished to show structure.

(1) Stalactites and stalagmites from the Luray Caves and The Grottoes, in Virginia.

(2) Gypsum rosettes and incrustations from Mammoth Cave, Ky.

(3) Gypsum incrustations and rosettes, epsom salt, and stalactites and stalagmites, from Wyandotte, Ind.

(4) Stalactites and stalagmites from Marengo, Ind.

(5) Stalactites and stalagmites from the Percy and Robertson caves, near Springfield, Mo.

(6) Botryoidal stalactitic masses from caves in the Organ Mountains, New Mexico.

(7) Stalactites from the Copper Queen Mines, Arizona.

(8) Large translucent selenite crystals from a cave in Wayne County, Utah.

(9) The possible economy of cave products, shown by cut, turned, and polished blocks of cave marble (stalagmite); nitrous earth, from Mammoth Cave, Ky., together with a small vial of calcium nitrate extracted from the same by leaching.

(10) A series of specimens in alcohol illustrating the fauna of caves.

(11) A small series of photographs, bone breccia and flint chips, illustrating the occupancy of caves by human beings.

(12) A section of a cave, some 2 by 4 feet, and 2½ feet high, constructed from materials collected in Marengo, Ind., the materials occupying their original positions as taken from the cave.

As completed, the exhibit occupied two wall-cases, each some 30 feet in length, and three special bases carrying relief-maps and cave-section. One of the most impressive and unique of these exhibits is the relief-map of the United States, modeled by Howell, and showing the restoration of the ice sheet of the Glacial epoch. This map is



RELIEF MAP SHOWING THE RESTORATION OF THE ICE SHEET OF THE GLACIAL EPOCH.  
Modeled for the U. S. National Museum, under the direction of Mr. George P. Merrill, by E. E. Howell.





shown in the accompanying illustration (Pl. 57), the legend being reproduced below, as it is too illegible in the illustration:

U. S. NATIONAL MUSEUM  
DEPARTMENT OF GEOLOGY  
MODEL OF THE | UNITED STATES

showing the theoretical restoration of the | Ancient Ice-Sheet | at the stage of the Glacial Period | following the Main Silt Epoch. | Constructed from data furnished by T. C. Chamberlain and associates | of the U. S. Geological Survey; the outline of the ice follows | the outer terminal moraine next north of the main slit deposits, and | probably does not represent a strictly synchronous stage throughout, as later | advances of the ice at some points overrode earlier ones, making it difficult | to trace a perfectly synchronous line. The slope of the surface of the ice is | based on an adaptation of that of Greenland, as given by Nansen. |

The scale of the model is 1 inch to 40 miles. | It shows the correct curvature at sea-level, and is a section of a globe |  $16\frac{1}{2}$  feet in diameter; elevation and depression above and below sea-level exaggerated five times.

At the beginning of the fiscal year the curator was in southwest Missouri searching for materials to illustrate cave phenomena. This work was interrupted by leave of absence from July 8 to August 1, to be resumed again at a later date. On August 18 the curator returned to Washington. The materials collected during these trips are noted under the head of "important accessions." Mr. W. H. Newhall, assistant, made in November a trip to Weyer's and Fountain caves in Virginia, and obtained a fine series of products from these sources, which are also mentioned under the head of accessions. Our thanks are due to the managers of these caverns, as well as to those of Luray, Mammoth, Wyandotte, Marengo, Percy and Robertson's, for the lively interest manifested and the assistance afforded in procuring as fine a series as possible both for the Columbian Exposition and for the Museum. We are also greatly indebted for assistance of a high order to Prof. W. O. Crosby, of the Massachusetts Institute of Technology, and to Mr. F. W. Crosby, of this city. Prof. Crosby was instrumental in procuring a large proportion of our series of glacial products, and to the enthusiasm of Mr. F. W. Crosby we owe a large and exceptionally fine series of Sicilian sulphurs and associated rocks and minerals, volcanic bombs from Lipari, and other materials elsewhere noted. From April 15 to May 15 the curator was in Chicago, engaged in the work of installing the exhibit there.

Below is given a list of the more important accessions of the year:

A series of typical iron ores from Santiago, Cuba. Gift of the Sigua Iron Company.

A collection of asphalts and assorted rocks from Trinidad. Gift of Mr. Clifford Richardson.

A collection of rocks and ores from Texas. Gift of W. H. Streerwitz.

A collection of glacial materials made by Prof. W. O. Crosby for the World's Columbian Exposition.

Eruptive rocks from the vicinity of Montreal, Canada. Received from Henry Lampard.

A collection of stalactites and stalagmites from the grottoes, Shendun, Va. Collected for the World's Columbian Exposition by Mr. W. H. Newhall.

A fine, large collection of lavas from the volcanoes of the Hawaiian Islands. Collected for the World's Columbian Exposition by Mr. A. B. Lyons.

A large collection of stalactites and stalagmites from the caverns of Luray. Collected for the World's Columbian Exposition by Mr. J. H. Morrison.

A large and valuable series of cave products from caves in Virginia, Tennessee, Kentucky, Indiana, and Missouri; also onyx marbles from Arizona and Lower California. Collected by the curator.

A collection of rock types from the vicinity of Hot Springs and Magnet Cove, Ark., as described by the late Francis Williams.

A beautiful series of the wonderful selenite crystals from Wayne County, Utah. Obtained from Dr. J. E. Talmage.

A series of septarian nodules, stylonites, volcanic bombs, fulgurites, and onyx marbles. Obtained from Mr. H. L. Ward.

A fine mass of drift copper, weighing 55 pounds, found in the Earnshaw quarries, some 20 miles southwest of Chicago. Obtained from Ossian Guthrie.

An exceptionally fine collection, comprising Elban iron ores, volcanic bombs from Lipari, miscellaneous volcanic products from Stromboli, Vulcano, and Etna; basaltic columns from Bonn, Prussia, and a large and beautiful series of sulphur and associated rocks and minerals from Sicily. Collected by Mr. F. W. Crosby.

A collection of cave products from the Wind Caves of South Dakota. Gift of A. F. McDonald.

Eighty-five views of volcanic phenomena in the Hawaiian Islands. Obtained from I. Williams for the World's Columbian Exposition.

Sixty-six views of South Italian volcanoes. Obtained from Dr. H. J. Johnston-Lavis.

Twenty-five views in Howe's Caves, New York. Obtained from S. R. Stoddard.

Fifty-eight views of Mammoth, Wyandotte, and Marengo caves. From Ben. Hains, jr.

Twenty-six views of Mammoth Cave. Obtained from Miss F. B. Johnson.

Seventeen views of Alaskan glaciers. Obtained from Prof. H. F. Reed.

Thirty-five views of Luray Caves. Obtained from Mr. C. H. James.

Thirty views of glacial phenomena. Obtained from Prof. W. O. Crosby.

Fifty-three views of glacial phenomena. Obtained from Prof. G. F. Wright.

The character of the routine work has varied but little from that of previous years. Especial effort was made in planning the World's Fair exhibit to so arrange the labels that, when returned to Washington, it could be made to fill a definite place in our regular system of installation. Thus, excepting that it was impossible to devote a large portion of the time to a preparation of the three exhibits there included, and to work them out in considerable detail, almost no departure was made from ordinary museum methods, and but little labor actually lost. Copy for 1,175 labels was sent to the printer and 1,391 printed forms received.

A large proportion of the routine work of this department consists in the examination of geological material transmitted to the Museum for this purpose. During the year 130 packages of this character were examined and reported upon. The total number of packages of material of all kinds received during the year for examination was 516,

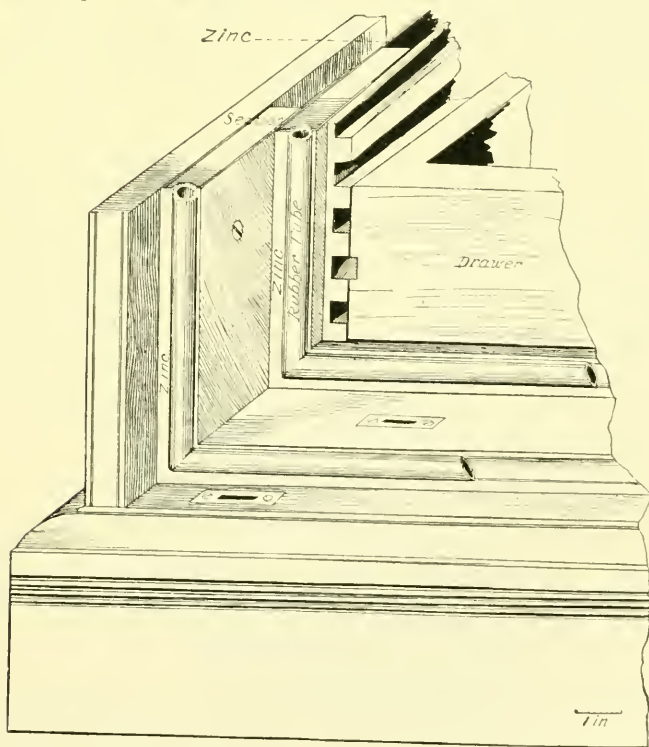
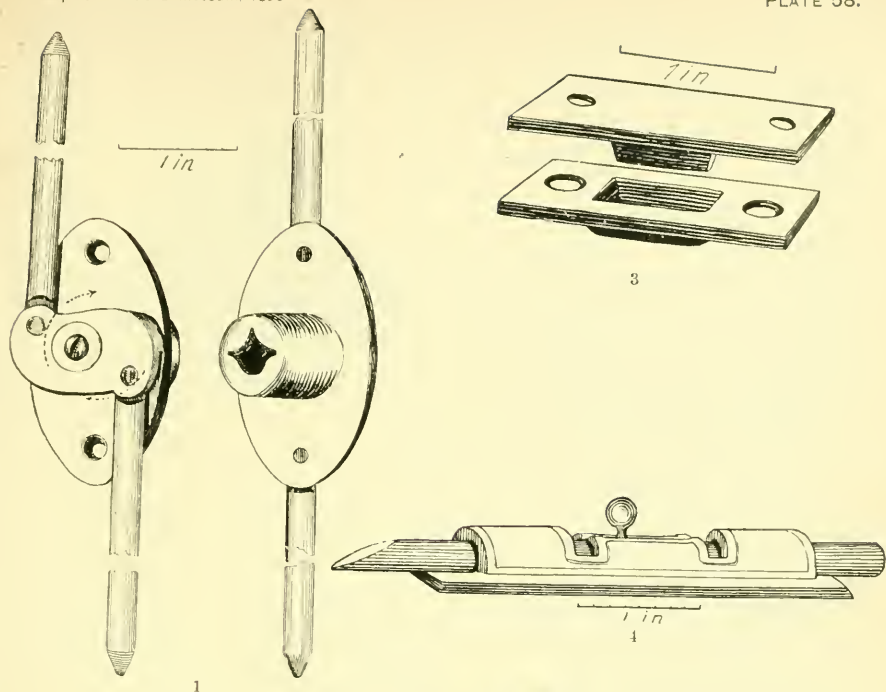
and it is therefore evident that this department has its full share of this kind of work. A detailed list of the receipts of this character will be found in Appendix V.

It may be observed that although this class of work is recognized as a regular part of the duties devolving upon the officers of the Museum, and is always promptly performed, it is probable that no work undertaken by the Museum produces less beneficial results to itself. The Museum can not charge for making these examinations, and it rarely happens that any of the material transmitted has any value for addition to the collections.

The fact that the collections are now divided, a portion being in Chicago, renders it impossible to give accurate figures regarding the number of specimens either in the reserve, exhibition, or duplicate series. The clerical force of the department has not been sufficient to keep the records in shape to furnish this information otherwise than by an actual count. The accumulation of material has been greater than during any equal space of time since Mr. Merrill's connection with the department. The amount of new material that has been actually added to the Museum collections can, however, be scarcely in excess of that withdrawn for the World's Columbian Exposition. The catalogue numbers for the fiscal year run from 60,001 to 60,927, inclusive, and from 68,050 to 68,471, inclusive.

As during the year previous, Mr. Merrill has been assisted by Mr. W. H. Newhall, to whose energy, states the curator, is due much of the progress made.

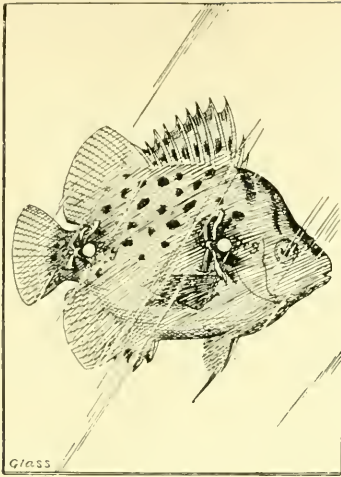




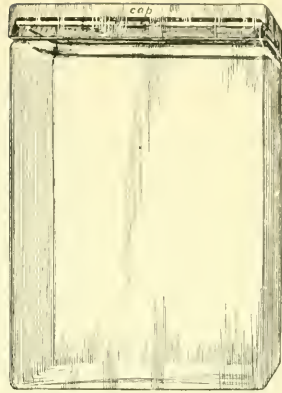
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 DETAILS OF FIXTURES FOR STORAGE CASES.

- Fig. 1. Combined bolt and lock (p. 27).
- Fig. 2. Corner section of storage case, showing method of dust proofing, etc (p. 28).
- Fig. 3. Stub and plate (p. 28).
- Fig. 4. Wedge bolt for binding doors (p. 28).

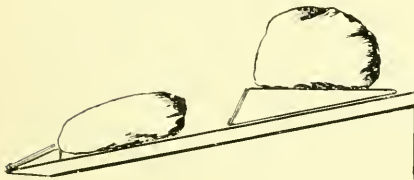




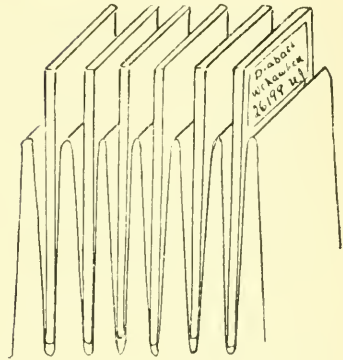
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9

DETAILS OF INSTALLATION METHODS IN THE U. S. NATIONAL MUSEUM.

- Fig. 5. Showing arrangement of specimens on sloping shelves (p. 31).
- Fig. 6. Device for storing microscopic slides (p. 32).
- Fig. 7. Rectangular jar (p. 33).
- Fig. 8. Mounting fish in rectangular jar (p. 35).
- Fig. 9. Reference table in exhibition hall (p. 41).





## V.—ADMINISTRATION.

### REVIEW OF THE WORK OF THE ADMINISTRATIVE BUREAUS.

#### OFFICE OF THE CHIEF CLERK.

The chief clerk's office remains under the supervision of Mr. W. V. Cox. The duties belonging to this office are mainly of an executive or administrative character. Among these duties are the general supervision of the expenditure of the appropriations; the preparation of proposals for supplies or labor; the opening of bids; awards of contracts; issuing orders for the purchase of supplies and employment of labor; the settling of accounts; the supervision of correspondence other than that of a scientific nature, or of that relating to specimens; the general supervision over employés and their assignment to duty; the granting of leaves of absence and other matters affecting the personnel of the Museum; the issuing of passes to the buildings; the conducting of boards of inquiry, inspection, and survey; the investigation of complaints, etc.

In Appendix II to this report a statement is presented showing the disposition of the unexpended balance on hand at the close of the year ending June 30, 1892. This is followed by a statement indicating the disbursements on account of the appropriation for the year ending June 30, 1893.

Since his last annual report, the chief clerk, the superintendent of buildings and labor, and the property clerk have had much of their time and that of their force occupied in the preparation of exhibits for the Columbian Historical Exposition in Madrid, and the World's Columbian Exposition at Chicago. Yet the extra work incident to the many additional requisitions made, and orders issued for supplies required to be purchased, together with the work to be done in the shops of the Museum by reason of these preparations, were all attended to by the regular employés, without additional cost to the Exposition, notwithstanding the fact that every purchase of supplies thus made and every order for work required the stating of a bill, and also involved a large amount of other incidental work. In the office of the chief clerk 666 vouchers, aggregating more than \$78,000, were stated and otherwise completed for settlement, and transmitted to the Board of Managers for payment. To perform this amount of extra labor the clerks were compelled to devote longer hours to their duties.

#### CORRESPONDENCE AND REPORTS.

This division of the administrative work remains under the charge of Mr. R. I. Geare. At the beginning of the year the force consisted of 2 stenographers, 1 accession clerk, 1 record clerk, 1 index clerk, 3 typewriters and a messenger.

The amount of correspondence has largely increased each year since the establishment of this division. In 1886, the total number of official papers prepared for signature was a little over 2,000. In the year covered by this report the total was 10,040. The reason for this growth is readily explained. Every letter asking for information is answered as promptly as possible, and the information, if obtainable, is always supplied. The fact that requests of all kinds are thus noticed, soon spreads among the acquaintances of the writers, and before long they also are led to correspond with the Museum on some subject in regard to which they may desire information. Another reason for the large increase this year is that since May, 1892, the distribution of Museum publications has been added to the work of this office, necessitating a large number of letters on matters relating to the subject of Museum publications.

The correspondence of the Museum also includes letters pertaining to the acquisition of specimens, and to their acknowledgment when received; also letters reporting the results of examination of material submitted for qualitative analyses.

The preparation and general supervision of the proof of the Annual Report of the Museum is also a part of the work which has been assigned to this division.

*Distribution of Museum publications.*—The edition of the Proceedings and Bulletin is entirely inadequate to supply the numerous demands made upon it, and in order that the edition might be increased, an estimate of \$18,000 for printing was made for the year ending June 30, 1892, an increase of \$8,000 over the appropriation for the preceding fiscal year. The amount granted by Congress, however, was only \$15,000. For the present fiscal year the sum of \$18,000 was again asked for. The following extract from a letter accompanying the estimate will show how urgently this appropriation is needed:

The sum of \$18,000 was asked for last year, for the purpose of enlarging the mailing list so as to include in it the more important public libraries and educational institutions, and to render it possible, in response to urgent requests, to send the publications of the Museum to individuals who need them for use in connection with scientific investigations. The sum appropriated (\$15,000) enabled the Museum to enlarge considerably its mailing list, but the full amount estimated for will be necessary to insure a satisfactory distribution.

The amount carried by the appropriation bill, as passed by Congress, however, was \$12,000, and as a necessary consequence, this branch of the Museum work has been much crippled.

The report for 1890 was distributed during the year. Copies have been forwarded to all individuals and institutions upon the mailing lists for Museum reports, to the consular and other officers of the Government who have coöperated with the Museum, and to persons who contributed to the collections during the fiscal year covered by that report. Editions of 500 copies each of several ethnological papers included in thereports for 1890 and 1891 have been sent out. The four-

teenth volume of the Proceedings of the National Museum has been mailed to all addresses upon the regular list for Proceedings volumes, and to more than 2,000 domestic and foreign libraries. Five hundred copies each of Proceedings Separates, Nos. 887 to 915, 919, 920, 922 to 926, 928, 929, 931, and advance copies of No. 944 have been sent to recipients upon the regular mailing lists and to persons making special application. Parts F and G of Bulletin 39, and Bulletin 40, have been distributed, and parts A to G, inclusive, of the former have been sent to all institutions upon the foreign and domestic library lists. Special Bulletin No. 1, entitled "Life Histories of North American Birds," by Major Charles Bendire, has been distributed. In addition to the regular distribution of Museum publications, more than 1,500 special sendings have been made during the year.

#### REGISTRATION AND DISTRIBUTION.

Mr. S. C. Brown, registrar, states that the total number of packages of all kinds received during the year was 29,409. The entries covering these receipts number 2,830, 863 of these packages containing specimens for the Museum, the others consisting of exchanges, supplies, etc. The record of outgoing packages for the year embraced 1,315 entries, covering 3,309 boxes and 902 packages, of which 853 contained specimens from the Museum, sent out as exchanges, gifts, and loans; 347 packages of specimens returned to owners, and 396 boxes contained material, exhibits, and cases sent to the Madrid Exposition. During the months of March, April, and May the exhibits prepared for the World's Columbian Exposition were shipped to Chicago. There were 1,340 packages of exhibits and cases transmitted by freight (twenty-six carloads), while packages containing the most valuable portions of the exhibits were forwarded by express. The storage record shows that 174 packages were stored and 51 were turned over to the curators.

The total number of accessions, *i. e.*, lots of specimens received for the Museum during the year, was 1,226. In addition, 516 packages of specimens were received for examination and report.

The records show that 13,581 specimens were sent out, including exchanges and specimens distributed to universities and colleges.

#### COLLECTIONS TRANSMITTED TO EDUCATIONAL ESTABLISHMENTS.

It has for many years been customary to distribute to educational establishments, as far as practicable, the duplicate material contained in the collections of the National Museum. Owing to the fact that there had accumulated a large number of applications for specimens from colleges and universities throughout the country, the curators of several of the departments were requested to separate into sets, for distribution, such of the duplicates in their charge as might be available for this purpose. The time necessary for work of this character could,

however, be spared only with great inconvenience, on account of the fact that the preparation of exhibits for the World's Columbian Exposition demanded the greater part of the attention of the curators. It is expected that within the course of a few months collections of fishes, marine invertebrates, and birds' skins will be ready for distribution. A number of sets of minerals, rocks, and ores, and casts of prehistoric stone implements have been already prepared.

During the months of March and April, 1893, the work of distributing the collections of rocks and ores recently prepared by the curator of geology was undertaken, there being among the pending applications many requests for geological material. In a number of instances in which it was not apparent that the institution which had made the application was still in need of specimens, a letter requesting information on this point was addressed to the Senator or Representative who had indorsed the application. The reply in nearly every instance was to the effect that a collection would be acceptable.

There have been distributed during the year 130 collections of all kinds, including a large number of sets of minerals and rocks.

GEOGRAPHICAL STATEMENT OF THE DISTRIBUTION OF SPECIMENS DURING THE  
 YEAR ENDING JUNE 30, 1893.

In Appendix III a geographical statement is given showing in detail the distribution of specimens of all kinds during the year. A brief summary of this statement is presented in the following table, which indicates the number of lots of specimens transmitted to institutions in the United States and in foreign countries:

United States:		United States—Continued.	
Alabama .....	2	Ohio .....	5
Arkansas .....	3	Pennsylvania .....	12
California .....	4	Rhode Island .....	1
Connecticut .....	1	South Dakota .....	4
Colorado .....	1	Tennessee .....	4
District of Columbia .....	10	Texas .....	6
Florida .....	1	Vermont .....	1
Georgia .....	5	Wisconsin .....	6
Illinois .....	7	Wyoming .....	2
Indiana .....	5	Other countries:	
Iowa .....	13	Australia .....	1
Kansas .....	4	Austria .....	2
Kentucky .....	1	Canada .....	4
Maryland .....	2	England .....	4
Maine .....	4	France .....	3
Massachusetts .....	14	Germany .....	3
Michigan .....	5	Italy .....	3
Minnesota .....	3	Russia .....	2
Missouri .....	5	Sweden .....	1
Nebraska .....	4		
New Jersey .....	2	Total .....	171
New York .....	11		

## BUILDINGS AND LABOR; POLICE AND PUBLIC COMFORT.

The force of watchmen, mechanics, and laborers is under the charge of Mr. Henry Horan, superintendent. In Mr. Horan's annual report there is included a statement of the work accomplished by the mechanics and laborers during the past year, a list of the machines, tools, and other property in his care, and a statement of the supplies purchased through his office. Extracts from his report, designed to indicate the character of the work performed by the employes connected with this department, will be found in Appendix IV.

## WORK OF THE MUSEUM PREPARATORS.

## TAXIDERMISTS.

Mr. William Palmer, chief taxidermist, reports that a large proportion of the time of his force has been devoted to completing and installing the exhibits for the World's Columbian Exposition. The actual work of mounting the specimens had already been finished, but the grouping of the pieces and the arrangement of the accessories remained to be done this year. Thirteen groups were prepared with great care, especial attention being given to making their surroundings as natural as possible. Some progress has been made toward reducing the number of skins in pickle, and two new lead-lined tanks have been provided for the better accommodation of those which are still awaiting attention. Numerous casts of various kinds have been made, and other incidental work attended to. The number of skins received during the year was 266, the total on hand June 30, 1893, being 427; 271 skins have been worked up.

About 30 specimens of fowls and pigeons have been added to the series of domestic animals during the year.

## OSTEOLOGICAL PREPARATORS.

Mr. F. A. Lucas, in charge of this work, reports that the preparation of specimens for the exhibition series was interrupted somewhat by work for the World's Columbian Exposition, but still compares favorably with the records of previous years:

*Number of specimens received, cleaned and mounted.*

	Mammals.	Birds.	Reptiles.	Batrachians.	Fishes.	Total.
Received as fresh specimens:						
Entire skeletons.....	3	19	2		3	27
Incomplete skeletons.....		1				1
Cleaned:						
Entire skeletons.....	7	15	3			25
Incomplete skeletons.....			2			2
Skulls.....	634	3	3	1	4	645
Mounted:						
Skeletons.....	1	12	2	2	6	23
Limbs and other pieces.....	2	2				4
Skulls.....	2	1	5	2	3	13
Total.....	649	53	17	5	16	740

It may be stated that the labor involved in mounting the skulls is but partially indicated by the figures which appear in the table, since the mountings in most cases were complicated in their character and the component bones of the skulls were distinctively colored. In addition to osteological work, there have been made 3 anatomical models, and 45 casts of reptiles, invertebrates, and combs and gills of domestic fowls. Besides this a group was completed, showing the common octopus and its surroundings, and a large number of specimens have been mounted for the synoptic series of invertebrates.

#### PHOTOGRAPHER.

Mr. T. W. Smilie, the photographer, reports that 857 negatives and 3,402 silver prints have been made during the year. A large proportion of these was for the departments of ethnology, mammals, geology, reptiles and batrachians, and prehistoric anthropology.

In addition, 281 extra prints were mounted and 147 cyanotypes, 22 lantern-slides, and 4 enlargements were made.

The National Museum, as heretofore, has rendered assistance to the U. S. Fish Commission in photographic work, the Commissioner furnishing the material necessary, and one assistant to aid the photographer. In this connection there were made 645 silver prints, 121 cyanotypes, and 57 lantern-slides.

#### COLORIST.

During the early part of the fiscal year, Mr. A. Zeno Shindler continued his work on the series representing the races of man. Thirty paintings of this series have been finished and turned over to the Department of Ethnology, while five more are in course of completion. About fifty figures have been painted for use in groups for the exhibit of the Department of Ethnology at the Columbian Exposition. These include, among others, a Sioux warrior mounted on a horse, a Navajo woman spinning, a Navajo silversmith, a Ute woman burden-bearer, a South American Indian, and a Zuñi warrior.

## APPENDIX I.

### THE SCIENTIFIC AND ADMINISTRATIVE STAFF.\*

#### DIRECTOR, EX OFFICIO.

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

#### EXECUTIVE OFFICERS.

- G. Brown Goode, Assistant Secretary of the Smithsonian Institution, in charge of U. S. National Museum, 1887. (1872.)  
Frederick W. True, Executive Curator, 1892. (1879.)  
W. V. Cox, Chief Clerk, 1886. (1879.)  
R. E. Earll, Special Agent for World's Columbian Exposition, 1891.

#### SCIENTIFIC STAFF.

- DEPARTMENT OF ARTS AND INDUSTRIES: G. Brown Goode, Curator, 1879. (1872.)  
*Section of Materia Medica*: C. H. White,† Medical Inspector U. S. Navy, Curator, (1893).  
*Section of Animal Products*: R. E. Earll, Acting Curator, 1889. (1878.)  
*Section of Naval Architecture*: J. W. Collins,† Curator, 1891. (1880.)  
*Section of Foods*: W. O. Atwater,† Curator, 1884.  
*Section of History*: A. Howard Clark, Curator, 1882. (1879.)  
*Section of Transportation and Engineering*: J. E. Watkins, Curator, 1887. (1885.)  
*Section of Graphic Arts*: S. R. Koehler, Curator, 1887.  
*Section of Forestry*: B. E. Fernow,† Curator, 1889.  
*Section of Physical Apparatus*: W. C. Winlock, Curator, 1889.
- DEPARTMENT OF ETHNOLOGY: O. T. Mason, Curator, 1881; Walter Hough, Aid, 1885; W. H. Ryland, Aid, 1893.  
*Section of Oriental Antiquities*: Paul Haupt,† Curator, 1888; Cyrus Adler, Assistant Curator, 1888.  
*Section of American Aboriginal Pottery*: W. H. Holmes,† Curator, 1889.
- DEPARTMENT OF PREHISTORIC ANTHROPOLOGY: Thomas Wilson, Curator, 1889.
- DEPARTMENT OF MAMMALS: Frederick W. True, Curator, 1881. (1879.)
- DEPARTMENT OF BIRDS: Robert Ridgway, Curator, 1880. (1872); P. L. Jouy, Aid, 1887. (1876.)  
*Section of Birds' Eggs*: C. E. Bendire,† Major, U. S. Army (retired), Curator, 1884.
- DEPARTMENT OF REPTILES AND BATRACHIANS: Leonhard Stejneger, Curator, 1889. (1881); Mr. F. C. Test, Aid, 1890.
- DEPARTMENT OF FISHES: Tarleton H. Bean,† Curator, 1880. (1874); Barton A. Bean, Assistant Curator, 1889. (1881.)
- DEPARTMENT OF MOLLUSKS: William H. Dall,† Curator, 1880. (1866); R. E. C. Stearns, Associate Curator, 1884; C. T. Simpson, Aid, 1889.
- DEPARTMENT OF INSECTS: C. V. Riley,† Curator, 1882; M. L. Linell, Aid, 1889.
- DEPARTMENT OF MARINE INVERTEBRATES: Richard Rathbun,† Curator, 1880; James E. Benedict, Assistant Curator, 1890. (1879); M. J. Rathbun, Aid, 1893. (1886.)

\* The date following each official title is that of appointment to the office now held; that within parentheses indicates the time of first connection with the museum.

†Honorary.

- DEPARTMENT OF COMPARATIVE ANATOMY: Frank Baker,† Curator, 1890; Frederick A. Lucas, Assistant Curator, 1886. (1882.)
- DEPARTMENT OF BOTANY (NATIONAL HERBARIUM): F. V. Coville,† Curator, 1893.
- DEPARTMENT OF VERTEBRATE FOSSILS: Othniel C. Marsh,† Curator, 1887.
- DEPARTMENT OF INVERTEBRATE FOSSILS:
- Paleozoic Section*: C. D. Walcott,† Curator, 1882.
- Mesozoic Section*: C. A. White,† Curator, 1885.
- Cenozoic Section*: William H. Dall,† Curator, 1880. (1866).
- Section of Fossil Plants*: Lester F. Ward,† Curator, 1881; F. H. Knowlton, Assistant Curator, 1887.
- DEPARTMENT OF MINERALOGY: F. W. Clarke,† Curator, 1883; W. S. Yeates, Assistant Curator, 1886. (1879.)
- DEPARTMENT OF GEOLOGY: George P. Merrill, Curator, 1890. (1880); W. H. Newhall, Aid, 1887. (1885).
- LIBRARY: Cyrus Adler, Librarian, 1892. (1888); N. P. Scudder, Assistant Librarian, 1882. (1879.)

## ADMINISTRATIVE STAFF.

CHIEF CLERK: W. V. Cox, 1886. (1879.)

## CHIEFS OF DIVISION:

- Correspondence and Reports*: R. I. Geare, 1890. (1880.)
- Registration and Storage*: S. C. Brown, 1881. (1876.)
- Printing and Labels*: A. H. Clark, 1882. (1879.)
- Disbursing Clerk*: W. W. Karr, 1888. (1879.)
- Property Clerk*: J. S. Goldsmith, 1891. (1886.)
- Photography*: T. W. Smillie, 1872.
- Superintendent of Buildings*: Henry Horan, 1880. (1857.)

## PREPARATORS.

- William Palmer, Chief Taxidermist, 1880. (1874.)
- Joseph Palmer, Chief Modeler, 1889. (1873.)
- A. Z. Shindler, Colorist, 1876.
- J. W. Scollick, Osteologist, 1884.
- Henry Marshall, Taxidermist, 1875.
- N. R. Wood, Taxidermist, 1888.
- A. H. Forney, Taxidermist, 1880.

## APPENDIX II.

## FINANCE, PROPERTY, SUPPLIES AND ACCOUNTS.

The disbursements from the unexpended balances of the appropriations for the previous fiscal year, ending June 30, 1892, are as follows:

## PRESERVATION OF COLLECTIONS.

From the balance of \$8,818.14, the following disbursements have been made:

Salaries or compensation, \$440; special or contract services, \$330.11; supplies, \$337.50; stationery, \$375.80; freight and cartage, \$593.30;

† Honorary.



travel, \$89.69; specimens, \$6,220.23; books and periodicals, \$414.46; a total expenditure of \$8,801.09, leaving a balance, July 1, 1893, of \$17.05.

#### FURNITURE AND FIXTURES.

The disbursements from the unexpended balance of this appropriation, \$3,300.37, are as follows:

Special or contract services, \$30; exhibition cases, \$1,454; storage cases, \$324; drawers, trays and boxes, \$56.05; frames, stands, etc., \$166.50; glass, \$1,038.14; hardware, \$43.88; tools, \$19.48; cloth, cotton, etc., \$8; glass jars, vials, etc., \$22.29; lumber, \$47.97; office furniture, \$6; tin, lead, etc., \$2.94; leather and rubber goods, \$13.32; apparatus, \$36.32; travel, \$3.70; a total of \$3,272.59, leaving an unexpended balance, July 1, 1893, of \$27.78.

#### HEATING AND LIGHTING.

From the balance of \$424.91, the following expenditures have been made:

Special services, \$3; gas, \$89; telephones, \$201.55; electric work, \$15; electrical supplies, \$14.44; rental of call boxes, \$20; heating supplies, \$81.57; a total of \$424.56, leaving a balance, July 1, 1893, of 35 cents.

On July 1, 1892, the unexpended balance of the appropriation for removing the old boilers under the Museum hall of the Smithsonian building, replacing them with new ones, and making necessary alterations, etc., was \$61.53, and there has since been expended for brick-work previously contracted for, the sum of \$60, leaving a balance of \$1.53.

Of the appropriation for removing the decayed wooden floors in the Museum building, and substituting therefor granolithic or artificial-stone pavement, there was a balance of \$525.36. Liabilities, amounting to \$522.53, have since been paid, leaving an unexpended balance, July 1, 1893, of \$2.83.

The appropriations for the fiscal year ending June 30, 1893, and the disbursements on account of the same, are as follows:

#### PRESERVATION OF COLLECTIONS.

The appropriation "for continuing the preservation, exhibition and increase of the collection from the surveying and exploring expeditions of the Government, and from other sources, including salaries or compensation of all necessary employés," was \$132,500, together with a deficiency appropriation of \$2,000, making a total of \$134,500. The expenditures were as follows:

Salaries or compensation, \$116,177.15; special or contract services, \$2,224.83; supplies, \$1,888.31; stationery, \$723.25; freight and cartage, \$1,889.75; travel, \$407.88; specimens, \$3,630.02; books and period-

icals, \$144.28; a total expenditure of \$127,085.47, leaving an unexpended balance, July 1, 1893, of \$7,414.53 to meet outstanding liabilities.

#### FURNITURE AND FIXTURES.

The amount appropriated "for cases, furniture, fixtures and appliances, required for the exhibition and safe-keeping of the collections of the National Museum, including salaries or compensation of all necessary employes," was \$15,000. The following expenditures have been made from this appropriation:

Salaries or compensation, \$7,903.47; special or contract services, \$91.22; storage cases, \$556.53; designs and drawings for cases, \$34.50; drawers, trays and boxes, \$252.60; frames, stands and miscellaneous woodwork, \$16; glass, \$774.92; hardware and interior fittings for cases, \$649.50; tools, \$25.08; cloth, cotton, etc., \$47.53; glass jars, bottles, etc., \$438.10; lumber, \$501.44; paints, oils, glue and brushes, \$383.35; office and hall furniture and furnishings, \$48.22; tin and lead, \$30.89; brick, plaster, etc., \$6.50; leather and rubber goods, \$21.86; apparatus, \$118.20; skylights, \$160; a total of \$12,059.91, leaving a balance on hand, July 1, 1893, of \$2,940.09 to meet outstanding liabilities.

The following is a list of cases made in the Museum shops during the year:

Two card-catalogue cases, 1 pine bookcase, 1 walnut bookcase, 2 small special cases, 2 unit storage cases, 12 unit table cases.

#### CASES REPAIRED AND ALTERED.

Four door-screen cases, 2 Chinese cases, 3 flat-top cases, 19 Kensington cases, 1 mahogany bird case, 6 slope-top cases, 9 storage cases, 5 upright cases, 3 wall cases, 1 walnut case, 1 card-catalogue case, 36 pine unit table cases, and 1 half-unit table case. In addition, 25 cases were glazed, and 231 were painted and cleaned.

#### Miscellaneous furniture and fittings made during the year:

Seventeen bases, 416 blocks for mounting specimens, 1 large storage rack, 100 packing boxes, 176 drawers for cases, and 115 frames for labels.

#### Miscellaneous furniture and fittings repaired and altered:

Five bases, 424 blocks for mounting specimens, 247 drawers for cases, 51 frames for labels, and 130 locks.

In addition to the work indicated above, many shelves, label-holders, screens, sash, ventilators, skylights, etc., were repaired or altered. Repairs were also made to the floors and roofs of the various buildings, and considerable painting was done from time to time.

#### HEATING AND LIGHTING.

The appropriation "for the expense of heating, lighting, electrical, telegraphic and telephonic service for the National Museum," was \$11,000, to which was added a deficiency appropriation of \$2,000 for heating, making a total of \$13,000. From this appropriation the following disbursements have been made:

Salaries or compensation, \$4,764; special services, \$19; coal and wood, \$5,003.04; gas, \$1,253.64; telephones, \$730.09; electric supplies, \$67.73; rental of call boxes, \$100; heating supplies, \$222.47; a total of \$12,159.97, leaving, July 1, 1893, an unexpended balance of \$840.03, to meet outstanding liabilities.

During the year the watch boxes, burglar alarms, time clocks and call-bell system were overhauled, and the unserviceable wire connected therewith removed. The latter was replaced with okonite wire, nearly 8,000 feet being required for this purpose. The telephone system has also been overhauled, the old wires having been removed and new ones substituted. Owing to the small appropriation for heating, lighting, and electrical service, it was found necessary to reduce the number of telephones in service. This was reluctantly done, as the telephone has been very useful in taking the place of messengers.

### APPENDIX III.

#### STATEMENT OF THE DISTRIBUTION OF SPECIMENS DURING THE YEAR ENDING JUNE 30, 1893.

##### NORTH AMERICA.

###### CANADA.

- Dr. John H. Garnier, Lucknow, Ontario: Siredons (2 specimens). For study. (D. 731.)
- College of St. Laurient, Montreal: Duplicate collection of rocks and ores (76 specimens, set 146). Gift. (D. 7766.)
- Geological Survey of Canada, Ottawa: Bones of Great Auk. Gift. (D. 7852.)
- University College, Toronto: Duplicate collection of alcoholic fishes (160 specimens, set 29). Gift. (D. 7662.)

###### UNITED STATES.

- ALABAMA. Blount College, Blountsville: Duplicate collection of rocks and ores (71 specimens, set 191). Gift. (D. 7666.)
- State Agricultural and Mechanical College, Auburn: Duplicate collection of rocks and ores (66 specimens, set 196); duplicate collection of alcoholic fishes (106 specimens, set 40). Gift. (D. 7659.)
- ARKANSAS. Arkansas Industrial University, Fayetteville: Duplicate collection of rocks and ores (68 specimens, set 198); duplicate collection of alcoholic fishes (106 specimens, set 42); duplicate collection of minerals (57 specimens, set 143). Gift. (D. 7567.) (D. 7591.) (D. 7667.)
- CALIFORNIA. Belmont School, Belmont: Duplicate collection of minerals. (57 specimens, set 134). Gift. (D. 7611.)
- Leland Stanford Junior University, Menlo Park: Hermit crabs (13 specimens); alcoholic fishes (10 specimens). Gift. (D. 7186.) (D. 7764.)
- CONNECTICUT. Hartford Theological Seminary, Hartford: Duplicate collection of rocks and ores (75 specimens, set 174). Gift. (D. 7702.)
- COLORADO. University of Colorado, Boulder: Duplicate collection of rocks and ores (77 specimens, set 161). Gift. (D. 7733.)

- DISTRICT OF COLUMBIA. George H. Boehmer, Washington, D. C.: Bird-skin. Exchange. (D. 7344.)
- Eastern High School, Washington: Duplicate collection of minerals (57 specimens, set 141). Gift. (D. 7661.)
- Public Schools, Washington: Duplicate collection of rocks and ores (104 specimens, set 2). Gift. (D. 7547.)
- E. E. Howell, Washington: Ores (2,550 pounds); minerals (54 specimens); *Lepidosteus ossesus* (1 specimen); rocks (18 specimens). Exchange. (D. 7337.) (D. 7373.) (D. 7572.) (D. 7593.)
- J. J. Jones, Washington: Indian pottery (1 specimen). Exchange. (D. 7549.)
- Bladen T. Snyder, Washington: Indian pottery (3 specimens). Exchange. (D. 7821.)
- FLORIDA. I. Greeger, Jacksonville: Copy of engraving "Ariadne." Exchange. (D. 7548.)
- GEORGIA. University of Georgia, Athens: Brachipods, corals, hydroids, etc. (42 specimens). Gift. (D. 7556.)
- Clark University, Atlanta: Duplicate collection of marine invertebrates (640 specimens, series IV, set 192); duplicate collection of marine invertebrates (2 boxes, special set); duplicate collection of minerals (57 specimens, set 147); duplicate collection of rocks and ores (75 specimens, set 173). Gift. (D. 7489.) (D. 7701.)
- Central Grammar School, Augusta: Duplicate collection of minerals (57 specimens, set 150). Gift. (D. 7776.)
- Emory College, Oxford: Duplicate collection of minerals (37 specimens, set 136). Gift. (D. 7663.)
- ILLINOIS. Carthage College, Carthage: Duplicate collection of minerals (57 specimens, set 140); duplicate collection of alcoholic fishes (106 specimens, set 39); duplicate collection of rocks and ores (174 specimens, set 181). Gift. (D. 7645.)
- C. F. Adams, Champaign: Birds' skins (66 specimens). Exchange. (D. 7449.)
- E. R. Boyer, Chicago: Small collection of foraminifera. For study. (D. 7382.)
- Lake Forest University, Lake Forest: Duplicate collection of rocks and ores (77 specimens, set 159). Gift. (D. 7737.)
- University of Chicago, Chicago: Duplicate collection of rocks and ores (104 specimens, set 7); duplicate collection of minerals (57 specimens, set 137). Gift. (D. 7637.)
- University of Illinois, Champaign: Duplicate collection of rocks and ores (57 specimens, set 195). Gift. (D. 7658.)
- Anastasio Alfaro (Costa Rica Exposition Commission), Chicago: Mounted birds (268 specimens). Exchange. (D. 7753.)
- INDIANA. Earlham College, Richmond: Duplicate collection of rocks and ores (68 specimens, set 194); duplicate collection of minerals (57 specimens, set 135). Gift. (D. 7657.)
- Hanover College, Hanover: Duplicate collection of rocks and ores (104 specimens, set 5.) Gift. (D. 7638.)
- Indiana University, Bloomington: Alcoholic fish. Gift. (D. 7553.)
- Capt. H. L. Johnson, New Albany: Pair of Canadian snowshoes. Exchange. (D. 7538.)
- Wabash College, Crawfordsville: Duplicate collection of minerals (57 specimens, set 153); duplicate collection of rocks and ores (77 specimens, set 141). Gift. (D. 7813.)
- IOWA. Iowa State Normal School, Cedar Falls: Duplicate collection of rocks and ores (77 specimens, set 158). Gift. (D. 7736.)
- Coe College, Cedar Rapids: Duplicate collection of minerals (57 specimens, set 133); duplicate collection of rocks and ores (197 specimens, set 197). Gift. (D. 7590.)

- IOWA.** Museum of State Library, Des Moines: Duplicate collection of minerals (57 specimens, set 126); duplicate collection of casts of prehistoric stone implements (107 specimens, set 12); stone mortar and pestle; duplicate collection of rocks and ores (104 specimens, set 4); Indian pottery (3 pieces). Gift. (D. 7366.) (D. 7612.) (D. 7853.)
- Des Moines College, Des Moines: Duplicate collection of rocks and ores (77 specimens, set 142). Gift. (D. 7836.)
- High School, Emmetsburg: Duplicate collection of minerals (76 specimens, set 119); duplicate collection of rocks and ores (76 specimens, set 118). Gift. (D. 7754.)
- Jefferson County Library Association, Fairfield: Skull of finback-whale; 46 mounted birds. Gift. (D. 7618.) (D. 7734.)
- Iowa College, Grinnell: Duplicate collection of casts of prehistoric implements (set 14). Gift. (D. 7591.)
- Hubert E. Brock, Mason City: Archaeological objects (44). Exchange. (D. 7444.)
- Public School, Paulina: Duplicate collection of rocks and ores (77 specimens, set 114). Gift. (D. 7780.)
- Western College, Toledo: Duplicate collection of rocks and ores (74 specimens, set 178); duplicate collection of minerals (57 specimens, set 138). Gift. (D. 7643.)
- KANSAS.** College of Emporia, Emporia: Duplicate collection of rocks and ores (77 specimens, set 165). Gift. (D. 7714.)
- University of Kansas, Lawrence: Duplicate collection of minerals (set 122); duplicate collection of rocks and ores (77 specimens, set 154). Gift. (D. 7324.) (D. 7749.)
- Oswego College, Oswego: Duplicate collection of rocks and ores (77 specimens, set 145). Gift. (D. 7774.)
- KENTUCKY.** Capt. J. R. Johnson, Louisville: Indian bow, quiver, and arrows. Exchange. (D. 7476.)
- MARYLAND.** Baltimore Manual Training School, Baltimore: Duplicate collection of rocks and ores (77 specimens, set 161). Gift. (D. 7730.)
- Loyola College, Baltimore: Duplicate collection of rocks and ores (70 specimens, set 193). Gift. (D. 7656.)
- MAINE.** H. C. Merrill, Auburn: Marble (2 specimens). Exchange. (D. 7517.)
- South Paris High School, South Paris: Duplicate collection of minerals (57 specimens, set 128). Gift. (D. 7387.)
- Prof. W. S. Bayley, Waterville: Rocks (38 specimens). Exchange. (D. 7563.)
- Colby University, Waterville: Duplicate collection of rocks and ores (103 specimens, set 49). Gift. (D. 7729.)
- MASSACHUSETTS.** Amesbury High School, Amesbury: Duplicate collection of rocks and ores (70 specimens, set 147); duplicate collection of casts of prehistoric implements (107 specimens, set 49). Gift. (D. 7767.)
- Cushing Academy, Ashburnham: Duplicate collection of rocks and ores (77 specimens, set 113). Gift. (D. 7819.)
- Prof. W. O. Crosby, Boston: Rocks (36 specimens). Exchange. (D. 7592.)
- Museum of Fine Arts, Boston: Impression from Pelham's plate of "Cotton Mather." Gift. (D. 7321.)
- High School, Brookline: Duplicate collection of minerals (57 specimens, set 124). Gift. (D. 7342.)
- Museum of Comparative Zoölogy, Cambridge. Hermit-crabs (15 specimens); *Lithodes spinosissimus* (2 specimens). Exchange. (D. 7513.) (D. 7633.)
- Memorial Hall of Paconotuck Valley Association, Deerfield: Arrow and spear-heads from Georgia (24 specimens). Gift. (D. 7508.)
- Natural History Society, Lawrence: Duplicate collection of minerals (set 123); duplicate collection of minerals (57 specimens, set 132). Gift. (D. 7333.) (D. 7559.)

- MASSACHUSETTS. J. V. Jackman, Marlboro: Rocks (12 specimens). Exchange. (D. 7475.)
- Smith College, Northampton: Foraminifera (12 vials). Gift. (D. 7454.)
- Grammar School, Salem: Duplicate collection of minerals (57 specimens, set 139); duplicate collection of marine invertebrates (640 specimens, series IV, set 193). Gift. (D. 7660.)
- George B. Frazar, West Medford: Red mercury ore. Exchange. (D. 7676.)
- MICHIGAN. University of Michigan, Ann Arbor: Duplicate collection of rocks and ores (143 geological specimens, set 1). Gift. (D. 7470.)
- Peter Lepp, East Saginaw: Birds' skins (4). Exchange. (D. 7550.)
- Masonic Library, Grand Rapids: Duplicate collection of minerals (57 specimens, set 148); duplicate collection of casts of prehistoric implements (107 specimens, set 18). Gift. (D. 7706.)
- Western Michigan College, Grand Rapids: Duplicate collection of alcoholic fishes (166 specimens, set 36). Gift. (D. 7681.)
- Michigan State Normal School, Ypsilanti: Duplicate collection of casts of prehistoric stone implements (107 specimens, set 15). Gift. (D. 7661.)
- MINNESOTA. Albert Lea College, Albert Lea: Duplicate collection of rocks and ores (71 specimens, set 190). Gift. (D. 7655.)
- Hamline University, Hamline: Duplicate collection of rocks and ores (75 specimens, set 172.) Gift. (D. 7700.)
- Stevens Seminary, Glencoe: Duplicate collection of alcoholic fishes (106 specimens, set 44); duplicate collection of minerals (57 specimens, set 131); duplicate collection of rocks (66 specimens, set 199). Gift. (D. 7510.)
- MISSOURI. Missouri Wesleyan Institute, Cameron: Duplicate collection of rocks and ores (77 specimens, set 157). Gift. (D. 7735.)
- University of Missouri, Columbia: Duplicate collection of rocks and ores (71 specimens, set 190); duplicate collection of fishes (106 specimens, set 41). Gift. (D. 7654.)
- Hooper Institute, Clarksburg: Duplicate collection of rocks and ores (76 specimens, set 171). Gift. (D. 7707.)
- Missouri Valley College, Marshall: Duplicate collection of rocks and ores (71 specimens, set 189). Gift. (D. 7653.)
- Missouri School of Mines, Rolla: Duplicate collection of rocks and ores (72 specimens, set 188). Gift. (D. 7652.)
- NEBRASKA. F. C. Kenyon, Lincoln: Myriopods (3 specimens). Exchange. (D. 7792.)
- Lincoln Normal University, Lincoln: Duplicate collection of rocks and ores (104 specimens, set 46). Gift. (D. 7589.)
- Nebraska Wesleyan University, Lincoln: Duplicate collection of rocks and ores (76 specimens, set 169). Gift. (D. 7718.)
- University of Nebraska, Lincoln: Duplicate collection of rocks and ores (76 specimens, set 170). Gift. (D. 7719.)
- NEW JERSEY. George F. Kunz, Hoboken: Package of iron ores. Exchange. (D. 7525.)
- E. M. Museum of Geology and Archaeology, Princeton: Duplicate collection of rocks and ores (103 specimens, set 50). Gift. (D. 7640.)
- NEW YORK. Union Free School, Canandaigua: Duplicate collection of rocks and ores (74 specimens, set 127). Gift. (D. 7641.)
- Hamilton College, Clinton: Duplicate collection of rocks and ores (104 specimens, set 2). Gift. (D. 7551.)
- Union School and Academy, Cooperstown: Duplicate collection of minerals (57 specimens, set 144); duplicate collection of rocks and ores (74 specimens, set 176); duplicate collection of fishes (160 specimens, set 36); duplicate collection of casts of prehistoric stone implements (set 16). Gift. (D. 7671.)
- Union School, Lockport: Duplicate collection of rocks and ores (75 specimens, set 180); duplicate collection of alcoholic fishes (160 specimens, set 37). Gift. (D. 7644.)

- NEW YORK. College of the City of New York, New York City: Duplicate collection of rocks and ores (104 specimens, set 6). Gift. (D. 7639.)
- Columbia College, New York City: Duplicate collection of alcoholic fishes (16 specimens, set 27). Gift. (D. 7458.)
- J. D. Sherman, jr., New York City: Coleoptera (18 dry specimens). Exchange. (D. 7777.)
- Miss Mary V. Worstell, New York City: Corals, Echini, starfishes and foraminifera. For study. (D. 7815.)
- Bertin A. Wright, Penn Yan: Unios. Exchange. (D. 7674.)
- Phelps Union School, Phelps: Duplicate collection of rocks and ores (74 specimens, set 178). Gift. (D. 7642.)
- Prof. H. A. Ward, Rochester: Rocks (6 specimens). Exchange. (D. 7619.)
- OHIO. Case School of Applied Sciences, Cleveland: Duplicate collection of minerals (57 specimens, set 154); duplicate collection of rocks and ores (78 specimens, set 140). Gift. (D. 7845.)
- Ohio Wesleyan University, Delaware: Duplicate collection of rocks and ores (76 specimens, set 168). Gift. (D. 7717.)
- Hopedale Normal School, Hopedale: Duplicate collection of minerals (57 specimens, set 127). Gift. (D. 7380.)
- Mansfield Memorial Museum, Mansfield: Duplicate collection of rocks and ores (76 specimens, set 167). Gift. (D. 7716.)
- Scioto College, Scioto: Duplicate collection of rocks and ores (77 specimens, set 163). Gift. (D. 7732.)
- PENNSYLVANIA. Wilson College, Chambersburg: Duplicate collection of rocks and ores (73 specimens, set 187). Gift. (D. 7651.)
- Central State Normal School, Lock Haven: Duplicate collection of rocks and ores (73 specimens, set 186). Gift. (D. 7650.)
- Dr. Harrison Allen, Philadelphia: Skull of *Phocæna communis*. For study. (D. 7379.)
- Stewart Culin, Philadelphia: Apache Indian playing-cards. Exchange. (D. 7346.)
- H. F. Moore, Philadelphia: Alcoholic mollusks (15 specimens). For study. (D. 7722.)
- Wagner Free Institute of Science, Philadelphia: Pliocene fossils. Exchange (D. 7768.)
- Central High School, Pittsburg: Duplicate collection of rocks and ores (77 specimens, set 156). Gift. (D. 7742.)
- Curry University, Pittsburg: Duplicate collection of rocks and ores (76 specimens, set 150). Gift. (D. 7713.)
- Duquesne College, Pittsburg: Duplicate collection of rocks and ores (76 specimens, set 149). Gift. (D. 7712.)
- Pennsylvania State College, State College: Duplicate collection of rocks and ores (77 specimens, set 155). Gift. (D. 7746.)
- Warren Public Schools, Warren: Duplicate collection of rocks and ores (73 specimens, set 185). Gift. (D. 7649.)
- RHODE ISLAND. Brown University, Providence: *Amphiuma means* (2 specimens); *Accipenser sturio* (1 specimen). Gift. (D. 7526.)
- SOUTH DAKOTA. Redfield College, Redfield: Duplicate collection of rocks and ores (77 specimens, set 153). Gift. (D. 7757.)
- State Normal School, Spearfish: Duplicate collection of rocks and ores (77 specimens, set 152). Gift. (D. 7756.)
- State Normal School, Valley City: Duplicate collection of minerals (57 specimens, set 146); duplicate collection of rocks and ores (74 specimens, set 175). Gift. (D. 7688.)
- State University, Vermillion: Duplicate collection of rocks and ores (77 specimens, set 151). Gift. (D. 7755.)

- TENNESSEE. U. S. Grant University, Athens: Duplicate collection of minerals (57 specimens, set 125); duplicate collection of rocks and ores (74 specimens, set 184). Gift. (D. 7359.) (D. 7648.)
- University of Tennessee, Knoxville: Duplicate collection of rocks and ores (74 specimens, set 183). Gift. (D. 7647.)
- Maryville College, Maryville: Duplicate collection of alcoholic fishes (106 specimens, set 43). Gift. (D. 7541.)
- TEXAS. University of Texas, Austin: Duplicate collection of rocks and ores (76 specimens, set 166.) Gift. (D. 7715.)
- Public School, Bastrop: Duplicate collection of minerals (57 specimens, set 142). Gift. (D. 7665.)
- Agricultural and Mechanical College, College Station: Duplicate collection of rocks and ores (77 specimens, set 160). Gift. (D. 7738.)
- Columbia College, Van Alstyne: Duplicate collection of minerals (130 specimens, set 130); duplicate collection of marine invertebrates (640 specimens, set 191); duplicate collection of rocks (67 specimens, set 200); duplicate collection of alcoholic fishes (135 specimens, set 33); duplicate collection of casts of prehistoric stone implements (107 specimens, set 20). Gift. (D. 7417.) (D. 7773.) (D. 7891.)
- VERMONT. Brattleboro Society of Natural History, Brattleboro: Duplicate collection of rocks and ores (74 specimens, set 182). Gift. (D. 7646.)
- WISCONSIN. High School, Arcadia: Duplicate collection of minerals (57 specimens, set 152). Gift. (D. 7820.)
- Jefferson High School, Jefferson: Duplicate collection of minerals (57 specimens, set 151). Gift. (D. 7775.)
- High School, Linden: Duplicate collection of minerals (57 specimens, set 145); duplicate collection of casts of stone implements (107 specimens, set 17). Gift. (D. 7675.)
- State Normal School, Oshkosh: Duplicate collection of marine invertebrates (Series IV, set 190). Gift. (D. 7367.)
- Sparta High School, Sparta: Duplicate collection of alcoholic fishes (166 specimens, set 34). Gift. (D. 7686.)
- H. P. Hamilton, Two Rivers: Indian pottery (20 pieces). Exchange. (D. 7516.)
- WYOMING. University of Wyoming, Laramie: Duplicate collection of casts of prehistoric implements (107 specimens, set 13); duplicate collection of rocks and ores (77 specimens, set 162). Gift. (D. 7384.) (D. 7731.)

## TRANSMISSIONS TO FOREIGN COUNTRIES.

## AUSTRALIA.

## NEW SOUTH WALES.

- Australian Museum, Sydney: Specimen each of *Polygodon* and *Amia calva*. Exchange. (D. 7583.)

## EUROPE.

## AUSTRIA.

- Dr. E. Keck, Aisterheim: Dried plants (2 packages). Exchange. (D. 7808.)
- Dr. A. Brezina, Vienna: Specimen case of gypsum and photographs. Exchange. (D. 7569.)

## ENGLAND.

- Edward Lovett, Croydon: Ethnological objects (15). Exchange. (D. 7578.)
- H. E. Dresser, London: Birds' skins (4 specimens). Exchange. (D. 7351.)
- Hugh Fulton, London: Shells (25 specimens); shells. Exchange. (D. 7409.) (D. 7817.)



## FRANCE.

- Prof. Lucien Cuenot, Nancy: Echini (2 specimens). Exchange. (D. 7445.)  
 A. C. Bonnet, Paris: Archaeological objects (132). Exchange. (D. 7741.)  
 S. E. Lassimonne, à Ysennre (Allier): Botanical specimens (205). Exchange.  
 (D. 7457.)

## GERMANY.

- Zoological Institute of the University, Berlin: Hexactinellid sponges (3 boxes).  
 Exchange. (D. 7606.)  
 Dr. W. Kabelt, Schweneim am Main: Land-shells (8 specimens). Exchange.  
 (D. 7752.)  
 Ludwig Molnar, Hollos: Birds' skins (15 specimens). Exchange. (D. 7477.)

## ITALY.

- Royal Museum, Florence: Archaeological objects (48). Exchange. (D. 7338.)  
 Dr. H. J. Johnston-Lavis, Naples: Rocks (7 specimens). Exchange. (D. 7600.)

## RUSSIA.

- Dr. A. Krassnow, Charkow: Dried plants (3 packages). Exchange. (D. 7807.)  
 University of St. Petersburg, St. Petersburg: Cast of Trilobite (*Asaphus megistos*).  
 Gift. (D. 7325.)

## SWEDEN.

- Prof. W. Leche, Stockholm: Alcoholic moles (4 specimens). Exchange. (D. 7816.)

LIST OF RECIPIENTS OF SPECIMENS TRANSMITTED, CHIEFLY FOR STUDY, DURING  
THE YEAR.

- Dr. Harrison Allen, Philadelphia, Pa.: Skulls of three bats. (D. 7840.)  
 Dr. J. A. Allen, American Museum of Natural History, New York City: Mammal  
 skins and skulls (37 specimens, including 8 type specimens). (D. 7696.) Six  
 skins and 7 skulls of *Hesperomys sitomys*. (D. 7834.) Three skins and skulls of  
*Hesperomys*. (D. 7851.)  
 Frank M. Chapman, American Museum of Natural History, New York City: Birds'  
 skins (18 specimens). (D. 7460.) Birds' skins (24 specimens). (D. 7814.)  
 Commissioner of Patents, Washington, D. C.: Nine typewriting machines (for  
 exhibition at the World's Columbian Exposition). (D. 7469.)  
 W. E. Curtis, Washington, D. C.: Door of the convent of La Rabida, a bolt by which  
 Columbus was chained, label for the same, and a piece of wood from the dun-  
 geon (for exhibition at the World's Columbian Exposition). (D. 7635.)  
 Leland Stanford Junior University, Palo Alto, Cal.: Alcoholic fish. (D. 7764.)  
 G. L. McKean, Chicago, Ill.: Oil portrait of George Washington (for exhibition at the  
 World's Columbian Exposition). (D. 7558.)  
 H. A. Pilsbry, Academy of Natural Science, Philadelphia, Pa.: Specimens of chitons.  
 (D. 7673.)  
 Hon. James B. Randal, Chicago, Ill.: Model of a quicksilver mine in California (for  
 exhibition at the World's Columbian Exposition). (D. 7636.)  
 S. N. Rhoads, Academy of Natural Science, Philadelphia, Pa.: *Synaptomys cooperi*  
 skull (2 type specimens). (D. 7576.)  
 Arthur Ruster, Baltimore, Md.: Bird-skin. (D. 7611.)  
 Prof. T. Salvadori, British Museum, London, England: Bird-skin. (D. 7423.)  
 Osbert Salvin, London, England: Birds' skins (21 specimens). (D. 7424.)  
 Witmer Stone, Academy of Natural Science, Philadelphia, Pa.: Birds' skins (29  
 specimens). (D. 7450.) Birds' skins (63 specimens). (D. 7531.)  
 Gordon Turnbull, Hartford, Conn.: Birds' skins (14 specimens). (D. 7574.)  
 U. S. Patent Office, Washington, D. C.: Three models of locomotives and fifteen  
 firearms (for exhibition at the World's Columbian Exposition). (D. 7573.)

Prof. A. J. Woolman, South Bend, Ind.: Squid, shell, starfish, and sea-urchins (6 specimens). (D. 7516.)

Prof. A. A. Wright, Oberlin College, Oberlin, Ohio: Rock sections (14 specimens). (D. 7482.)

## APPENDIX IV.

### BUILDINGS AND LABOR—POLICE AND PUBLIC COMFORT.

The following statement from the records of the Superintendent of Buildings is intended to indicate in a general way the character of the work performed by the mechanics and laborers during the year covered by this report:

1892.

*July.*—The labor involved in packing and shipping exhibits for the Madrid Exposition consumed a large amount of time during the month. The tinner was engaged for several days in making necessary repairs to the roof of the Museum building. The valves connected with the steam-heating apparatus have been repacked and the radiators overhauled.

*August.*—The lecture hall was cleaned and put in order after the completion of the work of preparing the exhibits for the Madrid Exposition. The windows of the east and west balconies were placed on pivots to provide better ventilation. The carpenters were engaged for a time in making packing cases for the shipment of exhibits to the World's Columbian Exposition. Considerable paving was done in the basement of the Museum building, and this necessitated the temporary removal of the material stored there.

*September.*—The buildings were suitably decorated on the occasion of the encampment of the Grand Army of the Republic, and the laborers were busy for many days preparing for the reception of the crowds of persons visiting the buildings. The furniture and apparatus of the chemical laboratory connected with the U. S. Geological Survey have been removed from the northeast pavilion, the Survey having found it necessary to make many changes on account of reduced appropriations.

*October.*—Improvements have been made in the system of installation of the telephone and other electric wires. To increase the efficiency of the telephone service it was found necessary to remove a number of instruments about the buildings. Various improvements have been made in the laboratory of the department of mammals, in the department of prehistoric anthropology, and in the telephone room. The exhibition cases throughout the Museum were cleaned during the month.

*November.*—A wagon shed was constructed south of the Smithsonian building. The exhibition cases in the north hall of the Museum were rearranged, and a number of specimens were withdrawn for transmission to the World's Fair. Work of a similar character in many of the departments demanded the attention of the laborers, and it was found necessary to use the lecture hall and several of the courts of the building for the preparation of exhibits. A workroom was fitted up for the use of the assistant curator of oriental antiquities.

*December.*—A number of specimens were transferred from the north hall to the department of prehistoric anthropology. The shed south of the Smithsonian building was painted, and also the hallway of the south tower. A number of storage-cases were removed from the northeast pavilion to the department of mammals.

1893.

*January.*—Several extra carpenters and laborers have been employed in connection with the World's Fair work. A large number of specimens in the exhibition hall of the section of graphic arts were transferred to new cases. An air-shaft was constructed in the northwest pavilion. The buildings were draped in mourning in respect to the memory of ex-President Rutherford B. Hayes. Screens were placed between the pillars, above the wall cases, on both sides of the north hall, to provide a background for the collection of busts which has been arranged on these cases.

*February.*—An apparatus for the distillation of alcohol was set up in the boiler room, and a new dynamo placed in the carpenter shop. Improvements were made in the laboratory of the mammal department at the south entrance. The shipment of exhibits to Chicago, for exhibition at the World's Columbian Exposition, was commenced on the 27th.

*March.*—Three of the basement rooms in the east wing of the Smithsonian building, which have been used by the registrar for storage purposes, were cleared out, to be refitted for the use of the Bureau of International Exchanges. The east shed was moved a short distance farther from the south wall of the building, in order to provide better light in the basement. On the 25th the lecture hall was prepared for the first lecture of the course to be delivered under the auspices of the Anthropological Society. The superintendent, and a number of men connected with his force, was ordered to Chicago, for the purpose of installing the exhibits.

*April.*—The material sent to the Exposition at Madrid was returned during the month, and a portion of the specimens were repacked for transmission to the Columbian Exposition. The last shipment of exhibits to Chicago was made on the 29th, the total number of carloads sent being twenty-four. Necessary repairs were made to the roof of the Smithsonian building.

*May.*—The carpenters were engaged for a time in constructing storage cases on the north balcony for the use of the department of historical collections. New copper gutters were laid on the roof of one of the towers of the Smithsonian building, and skylights were placed in the roof of the southeast pavilion of the Museum building, the work being done by outside contract. The steam-heating apparatus in the basement of the Smithsonian building was extended, and the entire basement white-washed. The window frames around the roof and the skylight of the Museum were painted.

*June.*—The work on the roof and in the basement of the Smithsonian building was continued during the month. Awnings were put up at the windows of both buildings for the summer. The firemen were engaged in making repairs to the steam pipes and radiators. Twenty-six incandescent lamps were hung in the lecture hall, the current being supplied by the dynamo in the carpenter shop.

## APPENDIX V.

### SPECIMENS SENT TO THE MUSEUM FOR EXAMINATION AND REPORT.

The following is a complete list of the specimens received for examination and report during the year ending June 30, 1893:\*

\* The first number accompanying the entries in the above list is that assigned to sendings "for examination" on the Museum records. The number in Arabic figures, in parentheses, relates to the record of permanent accessions. The third number, in Roman, and also in parentheses, indicates the department in the Museum to which the material was referred for examination and report.

- Adams, Robert E., Huntington, W. Va.: Petrified wood. 1936 (XIV).
- Albright, W. H., Detroit, S. Dak.: Insect. 1852 (X).
- Allen, D. E., Baylis, Ill.: Ores. 1854, 1901, 1969 (XVII).
- Allen, Prof. J. A., American Museum of Natural History, New York City: Birds' skins from Central America and other localities. 1996, 2010 (V-A).
- André, Charles, Eoon's Path, Va.: Insect. 2085 (X).
- Andrews, J. O., Gainesville, Fla.: White substance found after a heavy rain. 1919 (XV).
- Ankeny, William D., Mammoth, Pa.: 2 lead buttons. 1836 (XVII).
- Anthony, A. W., Denver, Colo.: 4 birds. (Returned.) 1917 (V-A).
- Ashcroft, M. E., Farmington, W. Va.: Insect. 1847 (X).
- Atherton, F. J., Lodi, Cal.: 3 birds' skins. (Returned.) 2065 (V-A).
- Ayres, H. B., Carlton, Minn.: 3 fragments of pottery found in a mound in Aiken County. 1942 (III).
- Babbitt, C. J., Flagstaff, Ariz.: Rock. 1812 (XVII).
- Baker, A. J. & Joseph, Eversole, Ky.: Ore. 2183 (XVII).
- Baker, F. H., Martinsburg, W. Va.: Insect. 1829 (X).
- Baldwin, A. A., Star, Kans.: 2 archaeological objects found by William Hodges. (Returned.) 1910 (III).
- Baldwin, A. P., Newark, N. J.: Abnormal egg of hen. 2066 (I).
- Baldwin, Charles, Great Falls, Mont.: 2 specimens of minerals. 1802 (XVI).
- Balster, F. S., Onray, Colo.: Concretion. (Returned.) 1865 (XVII).
- Banner, W. S., Fort Apache, Ariz.: Insects. 2029 (X).
- Barksdale, W. M., Mooresville, Ala.: Fish-skin. 1951 (VII).
- Barnes, B. E., Boyett, N. C.: Minerals. 1868. (Returned.) 2037 (XVI).
- Batchelder, C. F. (See under F. Stephens.)
- Bates, J. R., Greenville, Miss.: Ancient coin. 2241 (I).
- Becker, M. J., Fort Scott, Kans.: Fossils. (Returned.) 2263 (XIII-A).
- Beckwith, M. H., Newark, Del.: Hydroids. 1912 (26284) (XI).
- Bedwell, Ethel, Pentwater, Mich.: 2 insects. 1850 (X).
- Behrens, Charles M., Dallas City, Pa.: Clay. (Returned.) 2257 (XVII).
- Bertelsen, Mrs. H., Maquoketa, Iowa: Old-style watch. (Returned.) 2161 (II-A).
- Betts, George W., Cumro, Nebr.: Moth. 1878 (X).
- Biederman, C. R., Bonito, N. Mex.: Ore. 2087 (XVII).
- Binkley, S. H., Alexandersville, Ohio: Stone from boulder clay. (Returned.) 2106 (XVII).
- Bird, Frank G., Park City, Utah: Ore. (Returned.) 1822 (XVII).
- Bishop, U. S. Grant, Texas, Ky.: Fragment of stone. 2272 (XVI).
- Blish, W. G., Niles, Mich.: Branches and leaves from American *Arbor-Vitæ* hedge. 1957 (XV).
- Boisseau, Sterling, Crewe, Va.: Insects injurious to pine trees. 1914 (X).
- Bonnett, E. H., Stonewall, Colo.: 2 stone implements. 1938 (III).
- Borden, D., Somerset, Ky.: Mineral. 2163 (27190) (XVI).
- Botsford, Z. E., Nordmont, Pa.: Moth. 2254 (X).
- Bowie, Allen W., Clark's Gap, Va.: Earth and rock. 1807 (XVII).
- Bowman, D. A., Bakersville, N. C.: Minerals. 1939, 2146 (XVI).
- Boyd, G. W., Waynesboro, Tenn.: Geological material. 2079 (XVII).
- Boyd, Stephen D., Leesburg, Va.: Minerals. 1961 (XVI).
- Bradley, Rev. D. L., Cape Vincent, N. Y.: Egg-shaped stone. 2102 (XVII).
- Bradley, Terrill, Lester Manor, Va.: Indian canoe and specimens of pottery. 1992 (26600) (II-A).
- Branch Hydrographic Office, U. S., Lieut. O. E. Lasheer, in charge. (See under C. F. Pearson.)

- Brantley, R. A., Milano, Tex.: Concretions. 2179, 2188 (XVII.)
- Bressler, D. W., Chattanooga, Tenn.: Minerals. 1796 (XVI.)
- Brett, Walter, Lakeport, Cal.: Duck's breast infested with parasites. 2082 (I.)
- Brimley, H. H. & C. S., Raleigh, N. C.: Mammal skins and 2 snakes. 1869 (26135), 2202 (IV, VI).
- Brooke, Mrs. M. E., San Diego, Cal.: Stone head taken from a well. 1968 (III).
- Brooks, Allan C., Mount Forest, Ontario, Canada: Skin of magpie. (Returned.) 1843 (V-A).
- Bruce, H. W., Mangum, Tex.: Ore. (Returned.) 2286 (XVII.)
- Bruce, W. L., Nogal, N. Mex.: Rock. 1851 (XVII.)
- Brunot, H. S., Greensburg, Pa.: Skull of a fish. (Returned.) 2132 (VII.)
- Bryan, W. A. C., Nephi, Utah: Ore. 1924 (XVII.)
- Bryant, Walter E., Academy of Sciences, San Francisco, Cal.: 2 birds' skins. (Returned.) 2137 (V-A).
- Butt, William F., Lehi City, Utah: Fossils; rocks and clay. 2285 (XIII-A, XVII.)
- Caldwell, E. K., Monero, N. Mex.: Ore. (Returned.) 2259 (XVII.)
- Calfar, Frank H., Roswell, N. Mex.: Ore. (Returned.) 2070 (XVII.)
- Callihan, Dr. R., Rohnerville, Cal.: Stone. (Returned.) 2177 (XVII.)
- Campbell, J. J., Marshall, N. C.: Minerals. 2154, 2260 (XVI.)
- Campfield, C. H., Dulzura, Cal.: Mineral. 1786 (XVI.)
- Canute, James, Jacksonville, Fla.: Crustacean. 1795 (26062) (XI).
- Capute, W. W. (See under Miss L. Maltern.)
- Capwell, V. L., Luzerne, Pa.: Mineral. 2019 (XVI.)
- Carmicheal, J. J., Dallas, Colo.: 2 specimens of ore. 2043 (XVII.)
- Carpenter, F. E., Omaha, Nebr.: Skull of mammal. (Returned.) 2126 (IV.)
- Carter, E. I., Pittsburg, Pa.: Copper coin. 2191 (I.)
- Chapman, Frank M., American Museum of Natural History, New York City: 6 birds. (Returned.) 2004 (V-A).
- Chesterman, W. D. (See under R. E. Robinson.)
- Chidsey, Charles E., Seranton, Miss.: Plants. 1953 (XV.)
- Clayton, J. H., Summer Lake, Oreg.: Insect. 1895 (X).
- Cole, Fred H., Hot Springs, S. Dak.: Fossil cycad trunk. 2131 (27013) (XIV.)
- Collier, D. C., San Diego, Cal.: Crystals and rock. 2135 (XVII.)
- Colson, Eugene H., Washington, D. C.: Mineral. (Returned.) 2091 (XVI.)
- Converse, H. D., Campo, Cal.: Supposed lithographic stone, and ores. 2053 (XVII.)
- Cook, R. E., Newton, Colo.: Fossil. 2242 (XIII-A).
- Cooke, Joseph, Washington, D. C.: Mineral. 2145 (XVI.)
- Cooper, Dr. M., Wadena, Minn.: 5 specimens of minerals. (Returned.) 2092 (XVI.)
- Copp, Mrs. A., Burkeville, Va.: Sand. 1809 (XVII.)
- Corbett, E., Clarendon, Tex.: Ore. (Returned.) 2005 (XVII.)
- Cornett, Henry B., Greenville, Ky.: Stone implement. (Returned.) 2239 (III.)
- Corum, J. C., Spikenard, Oreg. Clay. 1785 (XVII.)
- Cory, C. B., Boston, Mass.: Birds' skins from Tobago. (Returned.) 1841 (V-A).
- Crenshaw, J. W., Phoenix, Ariz.: Supposed lithographic stone. 2035 (XVII.)
- Crevecoeur, F. F., Onaga, Kans.: Insects. 1965 (X).
- Crew, Henry, Lick Observatory, University of California, Mount Hamilton, Cal.:  
Negative from which a photograph was made of a curious piece of sculpture found in San Antonio Valley. 1844 (III.)
- Criswell, D. R., Buckholts, Tex.: Fiber-bearing weed. 2170 (XV.)
- Crouse, C. M., Syracuse, N. Y.: Celt and handle. 1782 (III.)
- Dana, D. S., Payson, Utah: Clay. (Returned.) 2120 (XVII.)
- Dann, Raymond G., Honeoye Falls, N. Y.: Indian beads. 2155 (II-A).

- Davis, John W., Crescent City, Fla.: Butterfly. 1791 (X).
- Davison, W., Tenady, N. J.: Botanical specimens. 1879 (XV).
- Day, E. L., Buckhannon, W. Va.: Ore. (Returned.) 2074 (XVII).
- DeWilder, H. L., Jacksonville, Oreg.: Mineral. 2250 (XVI).
- Dickey, Dr. J. A., Bristol, Tenn.: Ores. 1970 (XVII).
- Dickson, L. E., Geological Survey of Texas, Austin, Tex.: Supposed fossil tooth of mammal from Iowa. (Returned.) 2045 (XII).
- Doty, W. F., Marionville, Mo.: Rock. 1804 (XVII).
- Dow, Mrs. Elizabeth K., New York City: 7 skins of Paradise Trogon. 2164 (27125) (V-A).
- Draper, E. A., Litchfield, Nebr.: Insect. 1833 (X).
- Drew, C. V., Ouray, Colo.: Rocks. 1985 (XVII).
- Duffy, H. J., South Bend, Wash.: 5 specimens of ores. (Returned.) 1946 (XVII).
- Dugès, Prof. A., Guanajuato, Mexico: Insect. 2227 (X).
- Durock, P. H., Pecos City, Tex.: Mica. 1905 (XVII).
- Dutcher, William, New York City, through Dr. Leonhard Stejneger: 2 young loons. (Returned.) 2221 (V-A).
- Eblough, Jeremiah, Carrollton, Md.: Minerals. 3 specimens of ore; 1940 (2052, returned) (XVI, XVII).
- Edwards, B. M., Marshall, N. C.: Insect. 1825 (25156). (X.)
- Egleston, Dr. T., Columbia College, New York City: Minerals. 2006 (XVI). 1 specimen retained (26514), and the remainder returned.
- Elliott, J. D., Young Island, S. C.: Insect. 1870 (X).
- Elting, R. O., Kansas, Kans.: Mineral flakes. 1824 (XVI).
- Enos, Mrs. D. C., Saratoga, N. Y.: Moths. 1805 (X).
- Evans, Creed, Low Gap, N. C.: Minerals. 1874, 1959, 1976, 2025 (XVI).
- Evans, H. Clay, Chattanooga, Tenn.: Ore. (Returned.) 1884 (XVII).
- Fairchild, James H., Chicago, Ill.: Concretion. (Returned.) 2042 (XVII).
- Finn, John, Washington, D. C.: Alcoholic fish. 1881 (VII).
- Fish Commission, U. S. (See under W. R. Harris.)
- Fisher, William H., Baltimore, Md.: 2 birds. 2008 (V-A).
- Fitcher, E. C., Monarch, Colo.: Minerals. (Returned.) 2129 (XVI).
- Fitzpatrick & Strickfaden, Anaconda, Mont.: Mineral. 2038 (XVI).
- Fletcher, W. A., Rhodelia, Tenn.: Ore. 1803 (XVII).
- Flood Brothers, Malden, Mass.: Coleoptera from North America and Tasmania. 1855 (X).
- Floyd, C. H. B., Savannah, Ga.: Indian pottery and two stone implements. 2121 (27333) (II-B).
- Foote, Dr. A. E., Philadelphia, Pa.: Minerals. 2122 (26833), 2123 (26834) (XVI).
- Forester, S. N., Norcross, Ga.: Fragments of supposed aerolite. 2143 (XVI).
- Forrester, Robert, Castle Gate, Utah: (Returned with one exception). 1973 (26690); shells, fossils, fossil bone, 2024; fossil (portion returned, and some retained) 2214 (27054); fossils, shells (returned) 2243 (XIII-A; IX; XIII-B).
- Forristel, James, Bozeman, Mont.: Ore. 2201 (XVII).
- Fowke, Gerard, U. S. Bureau of Ethnology: 2 axes found near the mouth of Straight Creek, Ohio. 2133 (III).
- Foye, G. D., Hyattsville, Md.: Mineral. 2117 (XVI).
- Fry, L., Rinkerton, Va.: Ores. 1960, 2021, 2048 (XVII).
- Gant, A. B., Graham, Tex.: Grass. 2234 (XV).
- Garrett, A. I., Lawrence, Kans.: Plants. 1999 (XV).
- Gardner, Frank A., Riverside, Cal.: Insects. 1966 (X).
- Gardner, W. D., Seattle, Wash.: Ore. (Returned.) 1863 (XVII).
- Geological Survey of Texas, Austin, Tex.: Fossil unionidae for study. 2211 (IX).
- Gemdt, F. L., Paris, Ontario, Canada: Insects. 2036 (X).
- Gilbert, Prof. Charles H., Leland Stanford Junior University, Palo Alto Cal.: Reptiles and batrachians. (Returned.) 2078, 2182 (VI).

- Gilbert Brothers, Omaha, Nebr.: 4 birds. 2028 (26677, 26767) (V-A).
- Glenn, Harvey L., Livingston, Mont.: Mineral. 1975 (XVI).
- Godbey, S. M., Chapel City, Tex.: Shells. 2114 (26852); shells from Texas and California 2166 (26979); shells (returned). 2195 (IX).
- Goldsmith, L., Duncan, Ariz.: Coal. 2278 (XVII).
- Gorman, W. A., West Chester, N. Y.: Worms. 2290 (X).
- Gouldie, Robert, Nashville, S. Dak., through Mr. Whitecomb: Conglomerate and rocks. 2023 (XVII).
- Grainger, Dr. F. C., Randolph, Mass.: Insect from Washington, D. C. 1915 (X).
- Greer, Dr. L. H., Yorktown, Ind.: Insect. 1778 (X).
- Gilfith, G. W., Wilmington, Del.: Shells. 2063 (IX).
- Guilford, H. M., Minneapolis, Minn.: Bird. (Returned.) 1900 (V-A).
- Haas, Miss H. V., Pekin, Ill.: Butterfly. 1788 (X).
- Hale, C. E., Marble Hill, Ga.: Bird's claw. 2169 (IV).
- Hales, Henry, Ridgewood, N. J.: Collection of ancient pueblo pottery and implements. 2114 (26917) (II-B).
- Hammitt, J. M., Pittsburg, Pa.: Perforated mussel shell found in an old Indian fort. 1988 (26515) (III).
- Hammond, L. F., Rensselaer Falls, N. Y.: Butterfly. 2246 (X).
- Hampton, J. H., Chelsea, Ga.: Mineral, clay. (Returned.) 2105, 2118 (XVI, XVII).
- Hardwick, W. P., Amarillo, Tex.: Nut. 1987 (XV).
- Hardy, Manly, Brewer, Me., Bird-skin. (Returned.) 2019 (V-A).
- Harper, John, Dye, Tex.: Insect. 2245 (X).
- Harris, Frank, La Crescent, Minn.: Birds' eggs. 2026 (26573) (V-B).
- Harris, G. E., Cassville, Mo.: Ore. 2162 (XVII).
- Harris, T. S., Boston, Mass.: Mineral. 1780 (XVI).
- Harris, W. R., Southwestern Academy of Sciences, Tyler, Tex., through U. S. Fish Commission. Shells (returned); shells (retained). 1913, 2101 (26759). (IX).
- Harvey, Rev. M., St. John's, Newfoundland: Birds' skins. 2109 (26901, 26902) (V-A).
- Hassett, E. B., St. Paul, Ark.: Ores. 2020, 2039, 2016 (XVII).
- Hedges, H. S., Douglas City, Wash.: Minerals. 2229 (XVI).
- Henley, Charles, Central City, S. Dak.: Mineral. 1982 (XVI).
- Henselbecker & Bedell, Red Bluff, Mont.: Ore. (Returned.) 2208 (XVII).
- Herbert, Dr. George, Richfield, Utah: Minerals. 2283 (XVI).
- Herrera, Prof. A. L., Mexico, Mexico: Insects. 2062 (X).
- Hershberger McD., East Marens, Wash.: Mineral sand. 2117 (XVI).
- Higdon, Hugh L., Globe, Ariz.: Ore. (Returned.) 2097 (XVII).
- Hines J. J., Wilkesbarre, Pa.: Clay. (Returned.) 2175 (XVII).
- Hodge, H. G., York, Ill.: Insects. 2200 (X).
- Holt, Andrew, Stellicoom, Wash.: Substance of a mineral character. 2058 (XVI).
- Holton, W. W., Shenandoah, Va., through Mr. William Palmer: Insects. 1815 (X).
- Hood, Miss Jessie L., Lynn, N. C.: Butterfly. 2136 (X).
- Hoppe, E. G., Cairo, Ill.: Silk cocoon (?). 1913 (X).
- Hopping, Ralph, Kaweah, Cal.: Coleoptera. 1810. (Returned with the exception of 10 specimens which constitute acc. (26029); 62 species of Californian coleoptera 1899 (26193); 47 species of coleoptera 2196 (27028). (X).
- Hourston, Joseph, Hindson's Bay Company, Cumberland House, Canada: Minerals. 1837 (XVI).
- Hunt, J. A., Eureka, Utah: Mineral. 2061 (XVI).
- Hunt, W. E., Greenville, Miss.: 2 specimens of pottery. 2016 (III).
- Hutchins, Miss H. B., Chicago, Ill.: Plant. 1932 (XV).
- Hutt, W. H., Casnovia, Mich.: Ore. (Returned.) 2217 (XVII).
- Hux, M. W., Weldon, La.: Silver coin. 2247 (I).
- Hyde, G. L., Eureka, Utah: Asphalt. 2270 (XVII).

- Ingraham, D. P., Elmira, N. Y.: 3 birds. 1931 (26269) (V-A).
- Intram, Robert, Chenoweth, Wash.: Plant. 1872 (XV).
- Jacquemin, C. B., Helena, Mont.: Minerals. 1927, 2098 (XVI).
- Jaske, Hermann, St. Mary's Convent, Dayton, Ohio: Minerals and zinc products. (Returned.) 1986 (XVI).
- James, A. J., Dallas, Tex.: Mineral. 2258 (XVI).
- Jameson, W. C., Rixeyville, Va.: Insects. 2251 (X).
- Jenkins, J. M., Westfield, Iowa: Supposed clay. 1991 (XVII).
- Jerome, Charles W., Minneapolis, Minn.: Plant. 1816 (XV).
- Johnson, Joseph, Stafford, Mo.: 3 specimens of rock. 1983 (XVII).
- Johnson, Dr. W. C., Micanopy, Fla.: Alcoholic specimen of snake. 2214 (VI).
- Jones, Rev. C. J. K., Louisville, Ky.: 2 worms. 2127 (X).
- Jones, Mrs. J. G., Bushnell, Fla.: Butterfly. 1891 (X).
- Jones, M. H., Guaymas, Sonora, Mex.: Beans. 1860 (XV).
- Kearl, T. V., Kearl's Cañon, Ariz., through W. J. McGee, U. S. Geological Survey: Fossil bones from Arizona. 2158 (27072) (XII).
- Kearney, R. A., Alexandria, Va.: Mineral. 2138 (XVI).
- Keeler, C. A., San Francisco, Cal.: Crustacean from the Farallone Islands. (Returned.) 1813 (XI).
- Kelly, R. A., Webster City, Iowa: Illinois third-vein coal with impressions of supposed human footprints. 2274 (27152) (III).
- Kent, W. F., Lockport, N. Y.: Birds' skins. (Returned.) 2153 (V-A).
- Kenyon, F. C., Lincoln, Nebr.: Myriopods. 2193 (27005) (X).
- Kerr, W. C., New Brighton, N. Y.: Sponge. 2150 (26940) (XI).
- Kimball, S. D., Canton, N. Y.: Herb—supposed cure for the bite of the rattlesnake. 2224 (XV).
- Kimber, Rev. A. C., New York City: Crab. 1776 (XI).
- Kinley, Charles, Crescent City, S. Dak.: Mineral. 1982 (XVI).
- Kirker, Miss A. J., Portland, Me.: Human skull, buttons, and other objects. 2248 (27468) (III).
- Kirkland, Jacob, Thorp Springs, Tex.: Ore. (Returned.) 2215 (XVII).
- Kitterman, G. B., Ottumwa, Iowa: Interglacial plants. 2213 (XIV).
- Knight, L. R., St. Joseph, Mo.: Insect. 2203 (X).
- Knight, W. C., Laramie, Wyo.: Stone implement, and 2 arrow-points. 2225, 2096 (26844) (III).
- Knox, W. D., Hillsboro, Tex.: Insect. 1954 (X).
- Kramer, E. D., Dayton, Ohio: Insect. 2081 (X).
- Krüsi, Graf, Gais, Switzerland: Butterfly-net. 2199 (27249) (X).
- Labouve, J. T., Derouen, La.: Insects. 2279 (X).
- Lacoe, R. D., Pittston, Pa.: Fossil plants, type specimens of Volkmann's prologue. 1893, 1903 (returned). (XIV).
- Lake, G. H., Lewiston, Idaho: Ore. 2275 (XVII).
- Lander, W. Tertsh, Williamston, S. C.: Tuckahoe or Indian bread. 2017 (26589) (II-A).
- Lartigue, Dr. G. B., Blackville, S. C.: Plants. 1827 (XV).
- Laws, Franklin, Windom, N. C.: Mineral. 1819 (XVI).
- Lee, M. H., Thurber, Tex.: Coal (?). 1937 (XVII).
- Lesser & Sawyer, Winslow, Ariz.: Meteoric iron. 2204 (27105) (XVI).
- Lewis, B. and W. A.: Express, Oreg.: Ores. 1853, 2041 (XVII).
- Lewis, H. B., Fairhaven, Wash.: Plant. 1823 (XV).
- Lewis, S. M., Fort Worth, Tex.: Skull of mammal. (Returned.) 1963 (XII).
- Lind, Hon. John, House of Representatives. (See under E. E. Stoeckert.)
- Linell, N. L., Fruita, Colo.: 3 species of locusts destructive to fruit trees. 1818 (X).
- Livingston, Knox, Bennettsville, S. C.: Insect found destroying hickory tree, and sample of its work. 1904 (X).



- Logan, Robert, Moapa, Nev.: Stone. 1922 (XVII).
- Lougencher, B. F., Maria, Pa.: Arrow-head. 1984 (III).
- Loomis, Rev. Henry, Yokohama, Japan: Fish. 2134 (VII).
- Loomis, L. M., Tryon, N. C.: 7 specimens of new Junco from southern California. 2015 (V-A).
- Loringshoff, H. F., Notor, Neschim, Government Tsernigoff, Russia: Book. 2228 (I).
- Love, Dr. T. B., Gunsight, Tex.: Mineral. 1806 (XVI).
- Lowrey, Col. W. L., Asheville, N. C.: 12 small fragments of minerals, mineral. 1801, 2013 (27176) (XVI).
- Lucia, I. W., Lexington, Mich.: Insect. 1885 (X).
- Lusk, Dr. P. B., Lewisburg, Ala.: Insect, leaf, stem, and root of plant. 1863, 2261 (X, XV).
- Lyman, Miss M. E., Middlefield, Conn.: Leaves of plant. (Returned.) 1941 (X).
- Lyon, James, Montpelier, Idaho: Oysters and small black mollusks. 1907 (XIII-A).
- McConnell, E. A., Boise City, Idaho: Gills of fishes. 1861 (XII).
- McGee, W. J. (See under T. V. Keam.)
- McGregor, H. B., Pontiac, Ill.: 2 wax impressions of silver medal. (Returned.) 2226 (I).
- McGregor, R. C., Denver, Colo.: Birds' skins, and skin of Junco. 1995 (returned), 2061 (V-A).
- McLellan, H. K., Hamilton, Ill.: Bone. 2069 (XII).
- McManner, Dr. C. S., White Springs, Fla.: Mineral. 2115 (XVI).
- McManus, J. E., Everett, Wash.: Coal. 1848 (XVII).
- McNeill, Frank, Herndon, Va.: Worm. 1890 (X).
- Maddox, R., Fort Wrangle, Alaska: Supposed ore. 1928 (XVII).
- Maltern, Miss Luella, Forestville, N. Y., through W. W. Capute: Insect. 1952 (X).
- Marsh, Charles H., Dulzura, Cal.: Brown rat; skin of bat. 1779 (25942), 1887 (26117) (IV).
- Marshall, Dr. D. M., Williamstown, N. Y.: Insect. 1917 (X).
- Marshall, John, Flagstaff, Ariz.: Mineral. 2076 (XVI).
- Mathewson, J. O., & Co., Augusta, Ga.: White sand. 1877 (XVII).
- Mattocks, J. H., Albuquerque, N. Mex.: Mineral. 1811 (XVI).
- Maxwell, J. A., Fulda, Minn.: Fragment of pottery. 2216 (27060) (II-B).
- Meeker, Dr. J. W., Nyack-on-Hudson, N. Y.: Plants. 1799, 1967, 2207, 2240, 2271 (XV).
- Mellier Drug Company, St. Louis, Mo.: Plant. 2077 (XV).
- Merrill, V. D., Bear Grove, Iowa: Bone and tooth of mammal (?). 1856 (IV).
- Meyran, Barney, Moseow, Idaho: Ore. 2124 (XVII).
- Mendenhall, M. O., Hot Springs, S. Dak.: Fossil skull of mammal. (Returned.) 2018 (VIII).
- Miles, Cyrus, West Middlesex, Pa.: Rock. 2095 (XVII).
- Miller, Charles, jr., Grand Rapids, Mich.: Insects, minerals, ores, minerals, minerals and clay. 1846, 2159 (2252 returned), 2072 (2090 returned). (X, XVI, XVII).
- Miller, C. F., Wolcottville, Ind.: Insect. 1908 (X).
- Miller, Mrs. E. V. D., Washington, D. C.: Ores from Virginia. 1948 (XVII).
- Miller, L. H., Little Falls, Wash.: 7 specimens of chemicals made by the aid of the new solvent of vegetable origin by Mr. Miller. 2253 (XVI)
- Miller, W., Grand Rapids, Mich.: 5 specimens of minerals. 2027 (XVI).
- Millis, F. T., Lehi, Utah: Ore. 2017 (XVII).
- Minor, Dr. T. C., Cincinnati, Ohio: Insects. 1876 (X).
- Mitchell, R. H., Memphis, Tenn.: 2 small fishes. 1956 (VII).
- Mitchell, Dr. Weir, Bar Harbor, Me.: Salmon gills with parasites attached. 1787 (VII).
- Mitchell, W., Prince Albert, Northwest Territory, Canada: Bird-skin. (Returned.) 2060 (V-A).
- Mode, N. W., Leavenworth, Ind.: Ore. (Returned.) 1989 (XVII).

- Moffett, Roscoe, Livingston Manor, N. Y.: Supposed meteoric stone. 1950 (XVI).  
(See under E. C. Welton.)
- Morgan, T. M., Cliff Mills, Va.: Mineral. 2034 (XVI).
- Morin, J., Hockinson, Wash.: Clay supposed to contain aluminum. (Returned.)  
2280 (XVII).
- Mosier, C. A., Seattle, Wash.: Head, wing, and tail of bird. 1955 (26369) V-A).
- Mudge, E. H., Belding, Mich.: 6 small shells taken from a mound. 1933 (III).
- Munson, M. S., Velasco, Tex.: Gorgonian. 2030 (26645) (XI).
- Musser, R. W., Cynthiana, Ky.: Large boulder impressed with tracks; residuum from  
sap of sugar. 1862, 2151 (XVII, XV).
- Myer, W. E., Carthage, Tenn.: Fossil. 1888 (XIV).
- National Museum of Costa Rica, San José, Costa Rica: 2 birds' skins. 1873 (V-A).
- Nay, Dr. H. E., Bristol, Conn.: Seed. 2057 (XV).
- Neal, Dr. J. C., Stillwater, Okla.: 3 specimens of ores. (Returned.) 1840 (XVII).
- Nelson, Peter, Charlotte Harbor, Fla.: Fish. 2194 (VII).
- Newlon, Dr. W. S., Oswego, Kans.: Fossils. 2237, 2249, 2273 (XIII-A, XII, XIII-A).
- Nielsen, J. A., Kooskia, Idaho: 3 specimens of minerals. 1958 (XVI).
- Nier, H. F., Livingston, Mont.: Mineral. 2012 (XVI).
- Nile, William, Dutch Flat, Cal.: Butterfly, with cocoon and eggs. 2235 (X).
- Nye, S., Station Camp, Tenn.: Clay. 2054 (XVII).
- Nye-Galbraith Drug Company, Boise City, Idaho: Plant, said to be cure for fevers.  
2269 (XV).
- Ober, F. A., Washington, D. C.: 22 stone implements. 2073 (26798) (III).
- Odeneal, A. T., Paris, Tex.: Metal. 2119 (XVI).
- Ogilvie, Dr. J. W., Allendale, S. C.: Fragment of jaw of fish. 2152 (VII).
- Ohlweiler, F., Cooper Tract, Pa.: Fossil plant. 2080 (XIV).
- Olmstead, Mrs. F. C., Stillwater, N. Y.: Stone implements from Ireland. 2112 (III).
- O'Neal, W. H., Virginia Beach, Va.: Fish. 2093 (VII).
- Orentt, C. R., San Diego, Cal.: Boulder taken from a well, showing material among  
which a stone head was found. 1909 (III).
- Osman, Miss L. E., Hillsborough, New Brunswick: Plants. 1849, 2238 (XV).
- Owens, Miss M. J., Jacksonville, Fla.: Specimen of earth supposed to contain kaolin.  
(Returned.) 2281 (XVII).
- Owsley, Dr. W. T., Glasgow, Ky.: Living rattlesnake. 1789 (26071) (VI).
- Paine, J. B., Ontario, Wis.: 7 specimens of minerals. 2222 (XVI).
- Paine, O. J., Durango, Colo.: Clay and other material. 2276 (XVII).
- Palmer, William. (See under W. W. Holton.)
- Pasala, J. C., Medellin, United States of Colombia: 39 gold ornaments. (Returned.)  
2165 (III).
- Pattee, Orson, Jarbalo, Kans.: Supposed worm. 2174 (XI).
- Patton, J. D., Cleveland, Tenn.: Fossil tooth of mammal. 2099 (XII).
- Payn, Elias, J., Tres Piedras, N. Mex.: Bituminous coal and supposed tin ore. 2003  
(XVII).
- Peabody, P. B., Owatonna, Minn.: Bird. (Returned.) 1997 (V-A).
- Pearson, C. F., Portland, Oreg., through U. S. Branch Hydrographic Office, Lieut.  
O. E. Lasheer, in charge: Waxy substance found on the inner beach at the  
mouth of the Nehalem River; sample of coal. 2032, 2168 (XVII).
- Pennypacker, C. H., West Chester, Pa.: Mineral. (Returned.) 2068 (XVI).
- Perkins, F. S., Burlington, Wis.: Fluted stone. 1790 (III).
- Perry, A. K., Beverly, N. J.: Insect. 2256 (X).
- Pfeiffer, F., Rock Springs, Wyo.: Supposed petrified hand and forearm of a man.  
2107 (III).
- Phillips, A. H., Hulberton, N. Y.: Stone. 1903 (XVII).
- Pierce, G. W., Wellsville, N. Y.: Clay. (Returned.) 1797 (XVII).
- Pitcher, Mary E., Madison, Ind.: Birds' skins. 2190 (V-A).

- Pleasants, J. H., jr., Baltimore, Md.: Birds' skins. (Returned.) 2157 (V-A).
- Poole, J. E., Haskell, Tex.: Insects. 2284 (X).
- Poole, Richard, Poolesville, Md.: Mineral. 2094 (XVI).
- Pope, H., Quebec, Canada: 2 skins, skulls, and bones of seals. 1839 (26021) (IV).
- Potter, William, jr., New York City: Bird-skin from Africa. (Returned.) 2167 (V-A).
- Price, Hon. Andrew, M. C., House of Representatives: Coal, 1859 (XVII).
- Price, J. K., Holly Brook, Va., through D. W. M. Wright: 2 specimens of ores (Returned.) 2282 (XVII).
- Price, W. H., Gainesville, Ga.: Worm. 1889 (X).
- Pride, W. J., Lynchburg, Va.: 2 specimens of mineral. 1800 (XVI).
- Putnam, J. H., Abbeville, La.: Substance found on the beach at Marsh Island. 2178 (27053) (XVII).
- Qualey, E. J., & Co., McMinnville, Ore.: Mineral. 2180 (XVI).
- Raber, C. A., Prescott, Ariz.: Supposed rock, ore. 1911, 1925 (XVII).
- Ragsdale, G. H., Gainesville, Tex.: Breast of bird, sterna of swans. 1972 (V-A, XII).
- Rambo, M. E., Lower Providence, Pa.: 2 fossil bones from Bad Lands, South Dakota; stone. 2059, 2128 (XII, XVII).
- Randall, C. W., Lockport, N. Y.: Insect. 1902 (X).
- Rathbone, C. F. and E. H., Eureka, Utah, Ore. (Returned.) 1798 (XVII).
- Ray, Mrs. C. H., Philadelphia, Pa.: Suit of clothing supposed to form portion of a costume of South Sea islander. (Returned.) 2187 (H-A).
- Ray, G. D., Burnsville, N. C.: Mineral. 1820 (XVI).
- Ray, J. B., Burnsville, N. C.: Mineral. 1794 (XVI).
- Read, M. C., Hudson, Ohio: Crustacean. 1857 (XI).
- Reeves, R. C., Salt Lake City, Utah: 2 specimens of ores. (Returned.) 2113 (XVII).
- Reich, M., Union Star, Mo.: Insects. 1883 (X).
- Resler, Arthur, Baltimore, Md.: Bird. (Returned.) 1930 (V-A).
- Rhodes, W. H., Placerville, Idaho: 2 specimens of rock. 2192 (XVII).
- Richmond, C. W., Bluefields, Nicaragua: Birds' skins, reptiles, fishes, insects, crustaceans: 2 skins of Cebus monkey with skulls, birds' skins, birds' nests and eggs, reptiles and batrachians, fishes, shells, insects, crustaceans, and worm parasites; through W. J. McClellan; 3 birds' skins, collection of mammal skins, birds' skins and skulls, humming bird's nest, reptiles, fishes, insects, and crustaceans from Nicaragua 1830 (26252) (V-A, VI, VII, X, XI); 1994 (26738) (except mammals) (IV, V-A, V-B, VI, VII, IX, X, XI); 1998 (V-A); 2083 (28121) (IV); (26809) (V-A); (26726) (V-B); (27382) (VI); (28042) (VII); (28181) (X); (27128) (XI).
- Robinson, R. E., Richmond, Va., through W. D. Chesterman: Mineral. 1882 (XVI).
- Robinson, Lieut. Wirt, U. S. Army: Mammal skin and photograph of mammal, birds' skins: humming birds, chiefly from Bogota. (Returned.) 1897, 1974 (IV, V-A).
- Rockhill, W. W., Washington, D. C.: Ethnological objects. 2084 (27007) (H-A).
- Rose, M. E., Washington, D. C.: 2 specimens of minerals, from Florida. 2033 (XVI).
- Rose, J. T., Uby, Mich.: Fossil tooth of supposed mammal, from South Dakota. 2055 (XII).
- Ross, S. E., Cabin Hill, Va.: Ore. (Returned.) 2031 (XVII).
- Rowe, C. H., Malden, Mass.: 25 specimens of North American coleoptera; insects. 1896, 2236; 1926, 1978. (Returned.) (X).
- Rost, Charles, Indianapolis, Ind.: Tree-frog. (Returned.) 2210 (VI).
- Rynewson, W. S., Indian Valley, Idaho: Rock. (Returned.) 1777 (XVII).
- Sackrider, C. A., Napoli, N. Y.: Mineral. 2181 (XVI).
- Salvin, Osbert, London, England: Birds. (Returned.) 1935, 2002 (V-A).
- Sandrock, W. J., Buffalo, N. Y.: Insects. 1858 (X).
- Sayer, A. J., Mount Olive, Va.: Ore. (Returned.) 2268 (XVII).
- Sayre, S. B., Elizabeth, W. Va.: Mineral. 1962 (XVI).

- Scharf, W. I., Washington, D. C.: Worm from Virginia. 1898 (X).
- Schmidt, Walter, White Plains, Va.: Ore and alkali. 1916 (XVII).
- Schultz, B. F., Tazewell, Tenn.: Bulb or egg plowed up in a field. 2261 (XV).
- Schwartz, John, Marseilles, Ill.: Insect. 2267 (X).
- Science College Imperial University, Tokio, Japan: Birds' skins. (Returned.)  
\* 1808 (V-A).
- Scott, O. C., Oskaloosa, Iowa: Plant. 2289 (XV).
- Scott, Tessia, Fort Klamath, Oreg.: Collection of butterflies. 1783 (X).
- Seward, Percy L., Lawrenceville, Ill.: Chrysalis. 1894 (X).
- Shaw, Lieut. C. P., U. S. Navy (retired): Plant supposed to be an antidote for the bite of a rattlesnake. 2220 (I).
- Sherman, J. D., jr., New York City: 25 specimens of North American coleoptera. 2197 (27027) (X).
- Shriver, Howard, Cumberland, Md.: Material resembling slate or plumbago; fossils, 2255 (returned) (XVII); 2288 (returned with exception of 1 specimen) (27390) (XIII-A).
- Slutt, G. W., Hillsboro, Va.: Rock. 1934 (XVII).
- Simpson, D. J., Sunnyside, Utah: Ore. (Returned.) 1864 (XVII).
- Simpson, Stewart, Ruthburg, Idaho: Mineral. 2173 (XVI).
- Singley, J. A., Austin, Tex.: 43 specimens, representing 13 species of birds; 91 archaeological objects. (Returned.) 2071, 2141 (V-A, III).
- Slack, C. W., Globe City, Ariz.: Ore. (Returned.) 1838 (XVII).
- Smith, Mrs. F. A., Elizabethtown, N. Y.: Insects. 2230 (X).
- Smith, G. H., Minneapolis, Minn.: Ore. 2223 (XVII).
- Smith, H. I., South Lebanon, Ohio: Crayfish, crayfishes, spiders. 1826 (26350), 1871 (26104), 1880 (XI, X).
- Smith, J. P., Price's Fork, Va.: Ore. 1981 (XVII).
- Smith, J. B., Brown, Colo.: Mineral. 2277 (XVI).
- Smith, Dr. L. H., Easton, Md.: Beetle. 1828 (X).
- Smitherman, S. J., Troy, N. C.: Supposed clay. (Returned.) 2001 (XVII).
- Smithsonian Institution, Bureau of Ethnology: Collection of ethnological objects; black steer robe painted with tribal history by a Piegan Indian. 1821 (26105), 1990 (II-A).
- Snow, C. C., Farmington, Utah: Ore. (Returned.) 1875 (XVII).
- Snyder, H. E., Beaver Dam, Wis.: 47 species of coleoptera. 1845 (X).
- Spencer, E., Big Pine, Cal.: Chalk. 2185 (XVII).
- Spray, S. J., Salida, Colo.: 4 specimens of minerals; 3 specimens of ores. 1945, 2100. (Returned.) (XVI, XVII).
- Sprinz, R., El Paso, Tex.: 2 antique ivory figures from Mexico. (Returned.) 2212 (II-B).
- Stahl, M., Bayley, Iowa: Butterfly. 1831 (X).
- Stedman & Co., Minnesota Lake, Minn.: Plant. 1832 (XV).
- Stejneger, Dr. L. (See under William Dutcher.)
- Stephens, F., San Bernardino, Cal., through C. F. Batchelder: 7 birds. (Returned.) 2007 (V-A).
- Steward, A., Bridgeport, Conn.: Insects. 2051 (X).
- Stewart, J. H., Broken Bow, Nebr.: Insect. (Returned.) 1793 (X).
- Stoeckert, E. E., through Hon. John Lind, M. C., House of Representatives: Sand \*supposed to contain gold. 1784 (XVII).
- Stonffer, Jeremiah, Wooddale, Pa.: Mineral. 1944 (XVI).
- Strinegger, Alexander, Phoenix, Ariz.: Rock. (Returned.) 2176, 2184 (XVII).
- Stump, J. M., White Oak, Ohio: Supposed bone of fossil mammal. 2219 (XIII-A).

\* A description of these birds' skins and also of No. 1712 sent previously, has been published in the Proceedings of the National Museum, Vol. XVI, No. 957.

- Squyer, Homer, Mingsville, Mont.: Fossil shells. (Returned.) 2089 (XIII-B).
- Swan, J. W., Bozeman, Mont.: Ore. 2287 (XVII).
- Swingle, Mrs. O. H., Dudleyville, Ariz.: 2 specimens of ore. (Returned.) 2168 (XVII).
- Talcott Brothers, Olympia, Wash.: Black sand; 2 specimens of ores. 1775; (2160 returned.) (XVII).
- Tally, M. E., Parkersburg, W. Va.: Pods from pine tree. 1906 (XV).
- Tappan, Mrs. C. C., Brooklyn, N. Y.: Flower. 2231 (XV).
- Taylor, Miss E., Troy, N. Y.: Dress of Eskimo woman. (Returned.) 2011 (II-A).
- The Druggists' Circular, New York City: Plant; portion of root, stem, and flower of a plant from Texas. 2022, 2198 (XV).
- Thomson, N. A., Victoria, Tex.: Plant. 2110 (XV).
- Thompson, E. E., Toronto, Canada: Birds' skins. (Returned.) 1923 (V-A).
- Thompson, W. F., La Luz, N. Mex.: Roek. 2411 (XVII).
- Thornton, M. E., Hickory, N. C.: Worm. 1979 (26419) (XI).
- Thropp, Miss Amelia, Oil City, Pa.: 4 beetles from Brazil. (Returned.) 1971 (X).
- Thurlow, Paul, Stamford, Colo.: Residuum left after the evaporation of a goblet full of snow. 2116 (XVII).
- Tichar, G. C., New York City: 2 specimens of so-called Mexican onyx. (Returned.) 1964 (XVII).
- Tilton, W. L. R., Prairie, Ohio: Plant. 2265 (XV).
- Tristram, Rev. H. B., Canon of Durham, The College, Durham, England: Various specimens of *Procellarida*. (Returned.) 1892 (V-A).
- Turnbaugh, I., Panaea, Nev.: 2 specimens of dendrites. 2209 (XVII).
- Turner, A. C., Ellensburg, Wash.: Sand. 2086 (XVII).
- Turner, J. H., Jonesville, Tex.: 2 specimens of minerals and seed of plant. 1867 (XVI, XV).
- Tweed, J. W., Ripley, Colo.: Stone implements. 1817 (III).
- Vanoy, E., Springdale, Ark.: Ore. (Returned.) 1920 (XVII).
- Vinson, J. S., Pendleton, Oreg.: Clay. 2205 (XVII).
- Voorhees, C. J., Millersburg, Ohio: 2 fossil bones of mammal from Texas. 2125 (XII).
- Voss, C. F. E., Portland, Oreg. Clay. 2218 (XVII).
- Wagner, Luther, Ruby, Wash.: Mineral. 2067 (XVI).
- Wall, W. A., Champion, Ala.: Supposed slug. (Returned.) 2186 (XVII).
- Walters, Bryon, Circleville, Ohio: 13 archaeological objects. (Returned.) 2142 (III).
- Ward, Rev. Philip J., Wyoming, Ohio: Insect. 1918 (X).
- Ward's Natural Science Establishment, Rochester, N. Y.: Human skull. (Returned.) 1842 (XII).
- Wardell, Caroline, Tongaloo, Miss.: Insect. 2014 (X).
- Ware, C. T., Johnson City, Tenn.: Portion of a hen. 2140 (XII).
- Wayne, A. W., Wallace, Idaho: 4 specimens of ores. 1949 (XVII).
- Weaver, J. T., & Co., Lyerly, Ga.: Sample of geological material. (Returned.) 2075 (XVII).
- Wells, G. H., Washington, D. C.: Copper knife found in a field in Michigan. (Returned.) 2050 (III).
- Welton, E. C., and Roscoe Moffett, Livingston Manor, N. Y.: Supposed meteoric stone. 1950 (XVI).
- Wheeler, E. S., Troy, N. Y.: Clay. (Returned.) 2189 (XVII).
- Whitcomb, Mr. (See under Robert Goudie.)
- White, Dr. C. D., Lexington, Minn.: Insect. 2139 (X).
- White, G. W., Webster, Miss.: Clay. (Returned.) 1814 (XVII).
- Whitehorn, Worth, Sizer, Nebr.: Mammal skin. 2130 (IV).
- Wilkinson, E., Mansfield, Ohio: Mineral. 2088 (XVI).
- Wilkinson, J. B., jr., New York City: Supposed marble. 1792 (XVII).

- Willard, C. D., Cottonwood, Ariz.: Stone. 1921 (XVII).  
 Willard, G. M., Cottonwood, Ariz.: Mineral. 2103 (XVI).  
 Williams, J. A., Cloud Chief, Okla.: Mammal bone; wings, tail, and head of bird. 2040 (26722) (XII); 2149 (V-A).  
 Williams, W. A., Puyallup, Wash.: 2 stones. (Returned.) 1977 (XVII).  
 Wilson, Samuel, Richland, Tex.: Fossil tooth of mammal and fossil shells. 2232 (XII).  
 Wilson, S. B., Surrey, England: Birds' skins from Hawaiian Islands. (Returned.) 1835 (V-A).  
 Wilson, Thomas, U. S. National Museum: Collection of 145 implements, ornaments, and pottery from Indo-China. 2262 (III).  
 Winton, G. B., San Luis Potosi, Mexico: 3 skins of imperial woodpecker. 2148 (26893) (V-A).  
 Wood, Miss C. M., Middleboro, Mass.: Plant from southern California. 2171 (XV).  
 Woods and Johnson, Jasper, Colo.: Ore. 1980 (XVII).  
 Woodward, Albert, Dayton, Wash.: Supposed silica. 2266 (27132) (XVII).  
 Worthen, C. K., Warsaw, Ill.: Mammal skins; 126 alcoholic bats and shrews; 100 alcoholic mammal skins; skin, skull, and leg-bones of *Felis yaguarundi*; mammal skins. 1781, 1834, 2056, 2104 (26763), 2172 (IV).  
 Wooster, A. F., Norfolk, Conn.: Mineral. (Returned.) 2233 (XVI).  
 Wright, D. W. M. (See under J. K. Price.)  
 Wright, J. W., Principal, Livingston Military Academy, Livingston, Ala.: Plant; insect; plant. 2156, 2206 (XIV, X, XV).  
 Wright, O. F., Chicago, Ill.: Supposed quartz. 2000 (XVI).  
 Yanger, E. R., Rockwood, Tenn.: Mineral. 1929 (XVI).  
 Yoder, George, Rosendale, Mo.: Deposit supposed to contain mineral. 2044 (XVI).  
 Young, J. W., Burnsville, N. C.: Mineral. 1886 (XVI).  
 Yount, Henry, Uva, Wyo.: 3 specimens of ores. (Returned.) 2009 (XVII).

*Index to list of specimens sent for examination and report, arranged geographically.*

Source.	No. of lot.	Total.
<b>North America:</b>		
British America	1837, 1839, 1843, 1849, 1923, 2036, 2060, 2238	8
Central America	1830, 1873, 1894, 1998, 2010, 2083	7
Mexico	1860, 2062, 2148, 2227	4
Newfoundland	2109	1
<b>United States:</b>		
Alabama	1866, 1951, 2156, 2186, 2206, 2261	6
Alaska	1928, 2187	2
Arizona	1812, 1838, 1911, 1923, 1925, 2029, 2035, 2076, 2097, 2103, 2158, 2168, 2176, 2184, 2204, 2278	13
Arkansas	1920, 2020, 2039, 2046	4
California	1779, 1786, 1810, 1813, 1844, 1887, 1899, 1909, 1966, 1968, 2007, 2015, 2053, 2065, 2078, 2083, 2135, 2137, 2166, 2171, 2177, 2182, 2185, 2191, 2235	25
Colorado	1817, 1818, 1865, 1917, 1938, 1945, 1980, 1985, 2043, 2061, 2160, 2116, 2242, 2276, 2277	15
Connecticut	1941, 2051, 2057, 2233	4
Delaware	1912, 2063	2
District of Columbia	1881, 1915, 2073, 2091, 2145	5
Florida	1791, 1795, 1891, 1919, 2033, 2115, 2194, 2244, 2281	9
Georgia	1877, 1889, 2075, 2105, 2118, 2121, 2143, 2169	8
Idaho	1717, 1861, 1907, 1949, 1958, 2124, 2173, 2192, 2269, 2275	10
Illinois	1781, 1788, 1834, 1851, 1894, 1901, 1932, 1943, 1969, 2000, 2042, 2056, 2069, 2104, 2172, 2200, 2226, 2267, 2274	19

*Index to list of specimens sent for examination and report, etc.—Continued.*

Source.	No. of lot.	Total.
United States—Continued.		
Indiana.....	1778, 1908, 1989, 2190, 2210.....	5
Iowa.....	1831, 1856, 1991, 2045, 2166, 2213, 2289.....	7
Kansas.....	1824, 1910, 1965, 1999, 2174, 2237, 2249, 2263, 2273.....	9
Kentucky.....	1789, 1862, 2127, 2151, 2163, 2183, 2239.....	7
Louisiana.....	1859, 2178, 2247, 2279.....	4
Maine.....	1787, 2019, 2248.....	3
Maryland.....	1828, 1930, 1940, 2008, 2052, 2091, 2117, 2157, 2255, 2288.....	10
Massachusetts.....	1780, 1855, 1896, 1926, 1978, 2236.....	6
Michigan.....	1816, 1850, 1885, 1933, 1957, 2027, 2050, 2072, 2090, 2159, 2217, 2252.....	12
Minnesota.....	1784, 1816, 1832, 1900, 1942, 1997, 2026, 2092, 2139, 2216, 2223.....	11
Mississippi.....	1814, 1953, 2014, 2106, 2241.....	5
Missouri.....	1804, 1883, 1983, 2044, 2077, 2162, 2203.....	7
Montana.....	1802, 1821, 1927, 1975, 1990, 2012, 2038, 2089, 2098, 2201, 2208, 2287.....	12
Nebraska.....	1793, 1838, 1878, 2028, 2126, 2130, 2193.....	7
Nevada.....	1922, 2209.....	2
New Jersey.....	1879, 2066, 2114, 2256.....	4
New Mexico.....	1811, 1851, 2003, 2070, 2087, 2111, 2259.....	7
New York.....	1776, 1782, 1792, 1798, 1799, 1805, 1842, 1858, 1962, 1931, 1947, 1950, 1952, 1964, 1967, 1993, 1996, 2004, 2006, 2010, 2011, 2102, 2150, 2153, 2155, 2164, 2181, 2189, 2197, 2207, 2221, 2230, 2231, 2240, 2246, 2271, 2290.....	37
North Carolina.....	1794, 1801, 1819, 1820, 1825, 1868, 1869, 1874, 1886, 1939, 1959, 1976, 1979, 2001, 2013, 2025, 2037, 2136, 2146, 2154, 2202, 2260.....	22
Ohio.....	1826, 1857, 1871, 1876, 1880, 1918, 1986, 2081, 2088, 2106, 2133, 2142, 2219, 2265.....	14
Oklahoma.....	1840, 2040, 2149.....	3
Oregon.....	1783, 1785, 1853, 1895, 2032, 2041, 2108, 2180, 2205, 2218, 2250.....	11
Pennsylvania.....	1836, 1893, 1903, 1944, 1984, 1988, 2049, 2068, 2080, 2095, 2122, 2123, 2132, 2175, 2191, 2254, 2257.....	17
South Carolina.....	1827, 1870, 1904, 2017, 2152.....	5
South Dakota.....	1852, 1982, 2018, 2023, 2055, 2059, 2128, 2131.....	8
Tennessee.....	1796, 1803, 1884, 1888, 1929, 1956, 1970, 2005, 2054, 2079, 2099, 2140, 2261.....	13
Texas.....	1806, 1867, 1905, 1913, 1937, 1954, 1963, 1972, 1987, 2022, 2030, 2071, 2101, 2110, 2119, 2125, 2141, 2144, 2166, 2168, 2170, 2179, 2195, 2198, 2211, 2212, 2215, 2232, 2234, 2245, 2258, 2272, 2284, 2286.....	34
Utah.....	1798, 1822, 1861, 1875, 1924, 1973, 2024, 2047, 2113, 2120, 2164, 2214, 2242, 2270, 2283, 2285.....	16
Virginia.....	1800, 1807, 1809, 1882, 1890, 1898, 1914, 1916, 1934, 1948, 1960, 1964, 1981, 1992, 2021, 2031, 2034, 2048, 2085, 2093, 2138, 2220, 2251, 2268, 2282.....	25
Washington.....	1775, 1823, 1848, 1863, 1872, 1946, 1955, 1977, 2058, 2067, 2086, 2147, 2160, 2229, 2253, 2266, 2280.....	17
West Virginia.....	1813, 1829, 1847, 1906, 1936, 1962, 2072.....	7
Wisconsin.....	1789, 1790, 1745, 2222.....	4
Wyoming.....	2009, 2096, 2107, 2225.....	4
West Indies.....	1841.....	1
South America:		
Brazil.....	1971.....	1
United States of Colombia.....	1897, 1974, 2165.....	3

*Index to list of specimens sent for examination and report, etc.—Continued.*

Source.	No. of lot.	Total.
Europe, including—		
Great Britain .....	1892, 1935, 2002, 2112 .....	4
Russia .....	2228 .....	1
Switzerland .....	2190 .....	1
Asia:		
China .....	2084 .....	1
Indo-China .....	2262 .....	1
Japan .....	1808, 2134 .....	2
Africa .....	2167 .....	1
Oceanica:		
Hawaiian Islands .....	1835 .....	1
Tasmania .....	1855 .....	1
Total .....		518

The numbers of lots of specimens referred to the various departments in the Museum, for examination and report, are indicated below:

Department.	Number of lots.
Arts and industries .....	8
Ethnology .....	9
American aboriginal pottery .....	2
Prehistoric anthropology .....	27
Mammals .....	14
Birds .....	44
Birds' eggs .....	3
Reptiles and batrachians .....	9
Fishes .....	12
Vertebrate fossils .....	1
Mollusks .....	9
Insects .....	85
Marine invertebrates .....	14
Comparative anatomy .....	15
Invertebrate fossils:	
Palaeozoic .....	9
Mesozoic .....	4
Fossil plants .....	8
Botany .....	38
Minerals .....	94
Geology .....	130
Total .....	518



## APPENDIX VI.

LIST OF ACCESSIONS TO THE U. S. NATIONAL MUSEUM DURING  
THE YEAR ENDING JUNE 30, 1893.

The accessions during the year embrace Nos. 25,885 to 27,150 inclusive. All material especially acquired for incorporation with the exhibit of the National Museum at the World's Columbian Exposition, and received during the fiscal year ending June 30, 1893, is included in this list. The objects acquired for this purpose previous to July 1, 1892, are grouped separately and follow the list.

- ABBOTT, Miss GERTRUDE (Philadelphia, Pa.). Collection of ethnological objects, consisting of a buffalo head, antelope heads, ostrich feathers, a cloak made of the skins of the tree-coney, skins of black and white monkey from Mount Kilimanjaro, and lion skins. Deposit. 25936.
- ABBOTT, W. L. (Bombay, India). Collection of ethnological objects, bones of Lammergeyer and crow, 2 specimens of *Limax*, alcoholic reptiles, 183 birds' skins from Kashmir and Baltistan, and a large and valuable collection of mammal skins, skulls, and alcoholic mammals from Kashmir, including specimens of Vigne's wild sheep, Himalaya ibex, Himalaya bear, and new species of Voles and others (25997); dried skin of Cyprinoid, 28 inches long; mammal skins, skulls and bones; pottery; 52 birds' skins, representing 34 species from the Vale of Kashmir and adjacent parts of northern India, and a collection of insects from Kashmir—consisting of lepidoptera, neuroptera, hymenoptera, homoptera, diptera, and coleoptera; model of boat (26251); ethnological objects from Comoro, Seychelles Islands, 206 birds' skins, representing 69 species, from Aden, Seychelles, Aldabra, Glorioso, and adjacent islands; a fine collection of rare birds' eggs, consisting of 107 specimens, representing 19 species, several of which are new to science; also 23 birds' nests, 71 fishes, reptiles, and batrachians\*, coral limestone, crustaceans, radiates and sponges, skeletons of *Testudo*, *Chelonia*, *Eretmochelys*, and *Emys*, and 2 skulls of sharks, collections of dry and alcoholic insects, mammals and shells, from the localities above named (27085).
- ABEL, JOHN C. (Lancaster, Pa.). Collection of archaeological objects, consisting of 2 hammer-stones of quartzite, 2 grinding-stones of the same mineral, 2 rude implements of white quartz, 5 worked flakes of jasper, 10 arrow or spear-heads, of porphyritic felsite, and a sample of calcareous sandstone (natural formation) from near Lancaster (26183); 51 hammer-stones, rude chipped implements, arrow-heads, perforators, worked flakes and fragments of pottery from the same locality (26259); 73 rude implements, spear-heads, worked flakes of quartz, quartzite, and jasper, drilled tablet, an unfinished ceremonial object, and water-worn pebbles from the Conestoga Hills (26163.)
- ACADEMY OF SCIENCES (San Francisco, Cal.), through Dr. J. G. Cooper. Land-shells, representing 5 species from Lower California (gift) (26185); land-shells from Lower California (exchange) (26688).
- ADAMS, C. F. (Champaign, Ill.). Specimen of *Sphenodon punctatum* from New Zealand. Purchase. 26212.
- ADAMS, W. H. (Chase, Ill.). Cocoon of *Ceeropia* silk-moth. 26912.
- ADLER, Dr. CYRUS (Smithsonian Institution). Six musical instruments, comprising a zurna from Constantinople; dymbelék from Cairo, raha'b el Mooghmu'nee, with bow; rebab with bow, biz man from Cairo, gaida from Tunis (gift) (25935);

\* Special reports published in Vol. xv. and Vol. xvi. of Proceedings U. S. National Museum.

shofar or Jewish horn (gift) (25947); 52 photographs representing religious scenes in Turkey, Syria, Egypt, Tunis, and Algiers (deposit) (25950); facsimile of a document belonging to the Jews of Ccchin India, written in the Tamil language (deposit) (25962); drum and staff used by the dervishes in Egypt (deposit) (26106); 3 Mohammedan talismans from Damascus (deposit) (26171).

AGRICULTURE, DEPARTMENT OF. Crayfishes from North Carolina, Mississippi, and Texas; Isopod parasitic on a shark, from San Diego, Cal. (26355); fresh-water and land-shells from California and Mexico, collected by Edward Palmer (26386); guinea pig in the flesh, obtained by Dr. F. L. Kilborne, director of Government Experiment Station, Bureau of Animal Industry, and transmitted to the Museum, through Mr. Albert Hassall, of the Department; living guinea pig (26910); crustaceans and startishes obtained principally from Texas (27002). Through Dr. A. K. Fisher: Land-shells, representing 5 species, from Minnesota and Mexico (27113).

*Division of Ornithology and Mammalogy* (through Dr. C. Hart Merriam). Seven hundred and seventy-four specimens, representing 46 species of reptiles and batrachians, collected by the Death Valley Expedition in California, Nevada, and Utah (deposit) (26017); land and fresh-water shells from the southwestern border of the United States (gift) (26339); specimen of *Microdipodops megacephalus*, and a specimen of *Arvicola (Chilotus) oregonus* (gift) (26343); fish-crow (gift) (26656).

*Division of Entomology* (through Prof. C. V. Riley). One hundred miscellaneous specimens of insects, collected in Texas by Mr. F. G. Schaupp (26239); 304 specimens, representing 60 species of Californian coleoptera (among which are 11 species new to the collection), collected by Mr. D. W. Coquillet (26122); 206 specimens, representing 80 species of coleoptera from southern California, also collected by Mr. Coquillet (26562).

AIKEN, J. B. (Breckenridge, Minn.). Stone mallet used by the Indians for breaking buffalo bones in order to obtain the marrow for making "pemmican;" collected by E. Connolly. 26189.

ALASKA COMMERCIAL COMPANY (San Francisco, Cal.). Skin of sea-otter, *Enhydra lutris*, with skull and bones of feet complete, obtained by the company and purchased for the Museum exhibit at the World's Columbian Exposition. 26526.

ALEX, Dr. H. N. (Chicago, Ill.). Twenty-seven specimens of Korean pottery, 2 bronze bowls, and a stone pot. Deposit. 27062.

ALLEN, IRA R. (Fair Haven, Vt.). Five specimens of spessartite from Amelia Court-House, Va. Purchased for World's Columbian Exposition. 26904.

ALLEN, J. S. (Chicago, Ill.). Drum, sticks, and a rattle. 26632.

AMERICAN TURQUOISE COMPANY (New York City), through Mr. John R. Andrews, president. Specimen of turquoise in gangue, and 7 cut stones of turquoise from the Cerillos Mountains, near Santa Fé, N. Mex. 26804.

ANDREWS, Dr. E. A. (Johns Hopkins University, Baltimore, Md.). Larval form of conger eel, from Maryland (26046); crab (*Sesarma angustipes* Dana) (26061).

ANDREWS, HENRY W. (U. S. consul, Hankow, China), through Department of State. Two specimens of painted snipe, *Rostratula bengalensis*, from the Province of Hupoh, and 2 butterflies from the Province of Sghohen, China. 26124.

ANDREWS, JOHN R. (See under American Turquoise Company.)

ANDRUS, W. J. (Hackensack, N. J.). La Fleche fowl. 26607.

ANGUS, JAMES (West Farms, N. Y.). Six rude implements and a fragment of steatite, from an aboriginal quarry at Johnstown, R. I. 26500.

ANTHONY, A. W. (San Diego, Cal.). Nine eggs (3 sets) of Townsend's junco, 2 eggs (1 set) of San Pedro partridge, and 4 eggs (1 set) of Guadalupe house-finch, with nest, new to the collection; also 4 eggs (1 set) of black-throated gray warbler, with nest, 3 eggs (1 set) of black-throated sparrow, 4 eggs (1 set) of Lincoln's sparrow, and 3 eggs (1 set) of streaked horned lark. Deposit. 26758.

- ANTHONY, W. A. (Denver, Colo.). Egg of Xantus's murrelet, *Brachyramphus hypoleucus*, from Guadalupe Island, Lower California. Deposit. 26171.
- APPLETON, D., & Co. (New York City). Centennial memorial volume of Washington's Inauguration, April 30, 1789-1889. Purchase. 25992.
- APPLETON, Capt. NATHAN (Boston, Mass.). Four photographs of the autograph of Sitting Bull, with letter and translation (26245); 2 copper coins, minted in Mexico or Santo Domingo about 1522, a letter mailed by balloon from Paris, January 1, 1871, during the siege of that city, photograph of the house at Pittsfield, Mass., which contained the clock that was made the subject of a poem by Longfellow, "The Old Clock on the Stairs", and a photograph of the yacht *Alice*, which made the first yacht trip across the Atlantic in 1866 (26250); 10 Spanish-Mexican copper coins, dated 1523-1535—found near the Ozuma River, outside the walls of Santo Domingo, and supposed to have been coined under authority of Cortez. (26374).
- ARIZONA ONYX COMPANY (Chicago, Ill.), through J. P. SANXAY. Two slabs of onyx marble from the quarries near Prescott. 26530.
- ARMSTRONG, JOHN S. (See under Smithsonian Institution. U. S. Bureau of Ethnology.)
- ARMSTRONG, THOMAS J. (Jersey City, N. J.). One-dollar Confederate note presented to Mr. Armstrong by Gen. Richard Taylor, of the Confederate army, for a cup of coffee. 26206.
- ASHBY, SCOTT (Delaplaine, Va.). Albino red-tailed hawk, *Buteo borealis*, in the flesh. 26549.
- ASSOCIATION OF INVENTORS AND MANUFACTURERS (Washington, D. C.). Portrait of Alfred Vail. Deposit. 26469.
- ATTWATER, H. P. (Rockport, Tex.). Two sets of eggs of gray-tailed cardinal, representing 6 specimens new to the collection, and 2 nests of the same bird; egg of wood-thrush, 3 nests of painted bunting, nest each of verdin, yellow-throated vireo, Western blue grosbeak, and Aadian flycatcher (26609); 7 eggs of Texan horned lark, *Otocoris alpestris Giraudi* with nest, 4 eggs of rose-breasted grosbeak, *Habia Indoricensis* from Chatham, Ontario, Canada (26126); 5 specimens of an undescribed species of Southern prairie hen, *Tympanuchus atrateri* Bendire sp. nov., from Texas (27012).
- AUDENREID, Mrs. M. C. (Washington, D. C.). Military sash worn by Gen. W. T. Sherman at Atlanta, Savannah, and at the grand review of the Army in Washington City in 1865, and presented by Gen. Sherman to Mrs. Audenreid. 26566.
- AUSTRALIAN MUSEUM (Sydney, New South Wales), through Dr. E. P. Ramsay, curator. Australian graptolites. Exchange. 26775.
- AVERY, S. P. (New York City). Portrait of Franklin, taken from a terra-cotta medalion by T. M. Renaud. 27069.
- AVERY, W. C. (Corinth, Vt.). Butterfly (*Papilio asterias*) and a moth (*Arctia virgo*). 26011.
- BAAR, Dr. H. (New York City). Silver inkhorn from Jerusalem (deposit) (26534); 2 manuscript copies of the Hebrew Pentateuch, with silk cloaks and silver plate (lent for exhibition at the World's Columbian Exposition) (26108). Returned.
- BACHE, RENE (Washington, D. C.) Book containing decalcomanic pictures. 26385.
- BAILEY, G. E. (Chicago, Ill.). Fragment of meteoric iron from Buenavista, Sinaloa, Mexico, weighing 14.4 grams. 26014.
- BAILEY, Maj. J. J. (Dansville, N. Y.). Bat (*Atalapha noveboracensis*). 26221.
- BAKER, Dr. FRANK. (See under Smithsonian Institution. National Zoological Park.)
- BAKER, L. L. (Colesville, Md.), through C. A. Stewart. Red-tailed hawk, *Buteo borealis*, in the flesh. 26345.
- BALDWIN, A. H. (Smithsonian Institution). Skeleton of alligator. Purchased for World's Columbian Exposition. 26360.
- BALDWIN & GLEASON COMPANY, LIMITED (New York City). Collection of specimens of printing on celluloid. 26998.

- BALES, C. H. (Fort Huachuca, Ariz.), through Dr. T. E. Wilcox, U. S. A. Alcoholic specimen of *Nyctinomus femorosaccus* Merriam. 26236.
- BALFOUR, HENRY (Oxford Museum, Oxford, England). Collection of ethnological objects. Exchange. 26027.
- BARAKKAT, Mrs. LAYYAH (Old Orchard, Me.). Collection of objects illustrating religious observances in Syria. Purchase. 25931.
- BARNES, B. E. (care of Prof. F. W. Clarke, U. S. Geological Survey). Fragment of meteoric stone found in Boyett, Wilson County, N. C. 26015.
- BARROWS, W. B. (Department of Agriculture). Nest of chimney swift, *Chatura pelagica* (25981); nest and 4 eggs (1 set) of olive-backed thrush, and nest and 5 eggs (1 set) of slate-colored junco, from New Brunswick (26796).
- BARTLEMAN, R. M. (U. S. Legation, Caracas, Venezuela). Thirty specimens of insects, principally coleoptera. 26213.
- BASKETT, J. N. (Mexico, Mo.). Skin of flicker (*Colaptes auratus*), with obscured plumage. 26873.
- BASSETT, GEORGE W. (Mattawoman, Md.). Larva of royal walnut-moth, *Citheronia regalis*. 26209.
- BAUR, DR. G. (Worcester, Mass.). Collection of insects from the Galapagos Islands. 26662.
- BAY, W. L. (Watrous, N. Mex.). Tree-boring beetle, *Acanthocinus spectabilis* (Lec.). 25922.
- BEAL, KENNETH F. (Washington, D. C.). Crawfish from Mount Marshall, Va. 26354.
- BEALE, Hon. TRUNTON. (See under Madame Schlemann.)
- BEAN, BARTON A., and HARRON, L. G. (U. S. National Museum). Fishes collected at Fortress Monroe, and representing the following species: *Micropogon*, *Liostomus*, *Bairdiella*, *Centropriustes*, *Stenotomus*, *Orthopristis*, *Sphyræna*, *Menidia*, *Stolephorus*, *Brevoortia*, *Larimus*, *Tautoga*, *Hemirhamphus*, *Tylosurus*, *Siphostoma*, *Alutera*, *Mouacanthus*, and *Paralichthys*. 25957. (See under Fish Commission, U. S.)
- BEAN, DR. T. H. (See under Fish Commission, U. S.)
- BECKWITH, M. H. (Newark, Del.). Statoblasts of fresh-water polyzoans (*Pectinatella*). 26284.
- BEDNALL, W. T. (Adelaide, Australia). Specimen of *Cypræ eximia* from the Eocene formation of Victoria, Australia. 26620.
- BEECHER, CHARLES E. (See under Yale College Museum.)
- BEECHER, M. W. (Babylon, N. Y.), through J. E. Watkins. Piece of wood from deck-beams of the steamship *Sarannah*, wrecked October 22, 1822. 26859.
- BELDING, L. (Stockton, Cal.). Collection of reptiles and batrachians from southern California. (26637, 27052.)
- BELL, Judge JAMES (Gainesville, Fla.). Specimen of Florida wild turkey, *Meleagris gallopavo osecola*. 27010.
- BEMENT, C. S. (Philadelphia, Pa.). Crystal of apatite from Renfrew, Ontario, Canada. 26824.
- BENDIRE, Maj. CHARLES E., U. S. Army (U. S. National Museum). Nest and 4 eggs of *Junco hyemalis carolinensis* from West Virginia (26167); 5 eggs of Audubon's shearwater from Ragged Island, Bahamas, West Indies (26238); 2 specimens of *Sarracenia purpurea* and one specimen of *Viburnum dentatum* (27141). (See under H. P. Attwater, D. B. Burrows, Lattin & Co., E. Kirby Smith, and F. H. Toby.)
- BENEDICT, DR. A. L. (Buffalo, N. Y.). Fossils from the Waterlime Group of Buffalo. 26038.
- BENEDICT, JAMES E. (U. S. National Museum). Skin of Cooper's hawk, *Accipiter cooperi*, from Virginia (26784); snake (*Ophibolus rhombomaculatus*), from Woodside, Md. (27111).
- BENGUAT, HADJI E. (Boston, Mass.). Collection of objects illustrating Jewish ceremonies (26388): tapestry, cloth for synagogue, desk, pointer, and coin (26916). Deposited for exhibition at the World's Columbian Exposition.

- BENJAMIN, W. E. (New York City). Collection of maps illustrating early explorations in America. Purchased for exhibition at the World's Columbian Exposition. 25990.
- BENSON, Lieut. HARRY, U. S. Army (Three Rivers, Cal.). Five sets of birds' eggs (25904); collection of eggs from Sequoia National Park, Tulare County, Cal., consisting of 47 specimens, representing 6 species; also bird's nest (26119); 2 specimens of California junco, *Junco hyemalis Thurberi* from Sequoia Park (26153); 4 eggs of Thurber's junco; 4 eggs of California woodpecker; 1 egg of spouted towhee, and 3 eggs of black-headed grosbeak (26615).
- BERNICE PAUANI BISHOP MUSEUM (Honolulu, Hawaiian Islands), through William T. Brigham, curator. Two specimens of *Acrulocercus nobilis*, and 1 specimen of an undetermined species (gift) (26874); 2 volumes containing specimens of Hawaiian kapa cloths (exchange) (27074).
- BERRY, E. W. (Passaic, N. J.). Specimens of *Hippa talpoida* and *Talorchestia megalophthalma* from Asbury Park. 25963.
- BIBBINS, ARTHUR. (See under the Woman's College of Baltimore.)
- BIEDERMAN, C. R. (Bonito, N. Mex.). Ores; scraper from the glacial debris of Sierra Blanca, N. Mex., and piece of petrified wood. 26781
- BISHOP, Dr. LOUIS B. (New Haven, Conn.), through J. E. Watkins. Egg of American crow, with unusual coloration. 26663.
- BISHOP, T. S. (New Britain, Conn.). Ribbon badge of Stanley Post No. 11, G. A. R. 26962.
- BISSINGER, ERHARD (U. S. Consul, Beirut, Syria).
- \* Games of chance ("Mankaleh," "Duk-Watah," "Damah," "Barjiss"); wooden puzzle and wire-ring puzzle from Syria; musical instruments, consisting of "Oud" (lute), "Bizug" (lute long-neck), "Faggeishah" (castanets), 2 pairs; "Urgun" (double-pipe reed instrument); "Mijwiz" (double pipe reed instrument); "Derbouka;" (earthenware drum); "Manjairah" (vertical flute); "Rikk" (small tambourine); iron "Drah" or Pic; wood "Dra" or Pic; set of iron weights; set of copper weights; "Mud," cereal hollow measure and its fraction; scale of copper; copper pans; steelyard of iron; petrified clams obtained from Mount Lebanon at an elevation of from 2,500 to 3,000 feet above the level of the sea (gift). 25902.
- BLACKBURN, Dr. J. W. (Government Asylum for the Insane, Washington, D. C.). Copperhead snake, *Ancistrodon contortrix*, juv. (26197); 2 snakes (26318).
- BLAIR, THOMAS (Shelbyville, Tenn.). Distorted specimens of *Unio plicatus*. 26039.
- BLAKE, Lady EDITH (King's House, Jamaica, West Indies). Four human skulls, 36 leg and arm-bones, and 67 fragments of ribs, vertebrae, etc., obtained from a cave near Pedro, parish of St. Elizabeth, Jamaica. 25976.
- BLANEY, HENRY R. (Boston, Mass.). Three plates and a tracing, illustrating the dry-ground aquatint process. Purchased for exhibition at the World's Columbian Exposition. 26897.
- BLATCHLEY, Prof. W. S. (Terre Haute, Ind.). Specimens of reptiles and batrachians from Mexico. 26198.\*
- BLAC, H. E. (Washington, D. C.). Sandstone concretion. 26216.
- BLUNCK, A. E. (Johnstown, N. Y.). Red-pile exhibition game fowls, duck-wing game, black-breasted red exhibition game fowls, black-breasted red game fowls (26748); brown-red game chicken (26845); golden duck-wing game fowl (26855).
- BOETTCHER, F. L. J. (Department of Agriculture). Frog. 26175.
- BOSTON ART STUDENTS' ASSOCIATION (Museum of Fine Arts, Boston, Mass.). Three pamphlets relating to drawings for process reproduction. 26605.
- BOSWELL, HENRY (Washington, D. C.). Black fantail pigeon. 26657.
- BOSWELL, R. H. (Washington, D. C.). Blondinette pigeon. 26188.

\*A description of new species will be found in Prof. Blatchley's paper in *Proceedings*, Vol. XVI, No. 922, pp. 37-42. 1893.

- BOUCARD, A. (London, England). Birds' skins from Central and South America, India, Formosa, and Borneo. Purchase. 26953.
- BOURKE, Capt. JOHN G., U. S. Army (Fort Ringgold, Tex.). Copper cannon-ball (25896); saddle obtained from the Garza revolutionists, and a 3-legged metate and grinder (26024).
- BOWMAN, D. A. (Bakersville, N. C.). Two specimens of anthophyllite in chlorite, from Bakersville. 26281.
- BOYLE, JOHN (U. S. National Museum). Opossum (*Didelphys marsupialis*). 26701.
- BRADLEY, TERRILL (Lester Manor, Va.). Collection of pottery, pipes, Sora house, and Indian dugout canoe. Purchased for exhibition at the World's Columbian Exposition. 26600.
- BRADY, Gen. T. J. (Colonial Beach, Va.). Lincoln banner, used in the Presidential campaign of 1860. 25927.
- BRAIDA, Hon. S. C. (See under Hon. Frank von Phul.)
- BRAMBLITT, Dr. W. H. (Pulaski, Va.). Two human skulls, 19 fragments of pottery, 2 Flint chips, 6 fragments of jaw-bone of Virginia deer, jaw-bone of gray fox, 2 split bones and 2 burnt bones of an animal exhumed at Saltville, Va. 26866.
- BRAUER, Dr. F. (See under Imperial Austrian Museum, Vienna.)
- BRAVERMAN, M. (Visalia, Cal.). Section of a cork tree grown at Visalia. 26467.
- BREXINGER, GEORGE F. (Table Rock, Colo.). Skins of Mexican crossbill, with set of 4 eggs and nest (gift) (26752); skin of American crossbill, *Loxia curvirostra minor*, with set of eggs and nest, from El Paso County, Colo. (purchase) (26836).
- BRETT, WALTER (Lakeport, Cal.). Specimen of double-crested cormorant, *Phalacrocorax dilophus*, from Clear Lake, Cal. (26177); bird parasites (26819).
- BREZINA, Dr. A. (See under K. K. Hofmuseum, Vienna, Austria.)
- BRIGHAM, WILLIAM T. (See under Bernice Pauahi Bishop Museum.)
- BRIMLEY, C. S. (Raleigh, N. C.). Snake (*Ophibolus rhombomaculatus*). 27135.
- BRIMLEY, H. H. & C. S. (Raleigh, N. C.). Four mammal skins (purchase) (26135); 24 specimens, representing 4 species of reptiles and batrachians (gift) (26439); Salamander (*Amblystoma tigrinum*) (gift) (26682).
- BRINTON, Mrs. EMMA G. (Chicago, Ill.). Collection of ethnological objects illustrating home life in the Black Forest, Germany. 26983.
- BRITTS, Dr. J. H. (Clinton, Va.). Fossil plants. 26619.
- BROADWAY, W. G. (Botanic Gardens, Trinidad, British West Indies). Two shells, and 6 eggs of a large land snail. 26507.
- BROCK, Dr. R. A. (Richmond, Va.). Five-dollar bill issued by James River and Kanawha Company, of Richmond, of which corporation Gen. Washington was the first president. 26919.
- BROEMER, WILLIAM (Baltimore, Md.). Archangel pigeons (26991, 27134).
- BROOKS, A. C. (Mount Forest, Ontario, Canada). Eight specimens, representing 7 species of birds' skins from British Columbia (26011); 2 skins of little grebe, *Colymbus auriatilis*, from India (26909).
- BROTHERS, Dr. L. J. (Washington, D. C.). Black tumbler pigeon (26187); white owl pigeon (26358); 2 blunette pigeons and 1 satinette pigeon (26391).
- BROWN, EDWARD J. (Washington, D. C.). Seven specimens of seaside-sparrow, *Ammodramus maritimus*, from Cobb's Island, Va. (26191); skin of Australian robin, *Petroica plumicea* (26370); skin of purple sandpiper, *Tringa maritima*, from Penobscot Bay, Maine (26880); skin of Scott seaside-sparrow, *Ammodramus maritimus peninsulae*, from Tarpon Springs, Fla. (27133).
- BROWN, G. S. (Vandalia, N. Y.). Stone implement, 12 arrow-heads and piece of pottery. 26316.
- BROWN, HERBERT (Tucson, Ariz.). Two species of snakes from Arizona. 26211.\*

\*One of these snakes is the second specimen of *Phyllorhynchus Browni* which has been obtained. The species was described in 1890.

- BROWN, JASPER (Norway, Iowa). Birds' eggs. Exchange. 26610.
- BROWN, J. STANLEY. (See under Treasury Department, U. S.)
- BROWN, R. W. (Washington, D. C.). Two land-snails from Jamaica (26097); scorpion (*Buthus carolinianus* Beam) (26141); mud-turtle from Virginia (27030); spider (*Phidippus tripunctatus*) (27147).
- BRUNETT, E. (London, England), through Prof. C. V. Riley. Specimens of European diptera, representing 90 species. Exchange. 26996.
- BRYANT, HENRY G. (Philadelphia, Pa.). Summer costume of an adult male of the most northern Eskimos of the Whale Sound region, North Greenland, collected by Mr. Bryant during the summer of 1892 while connected with the Peary Relief Expedition. 26841.
- BULLMAN, CHARLES (New York City.). Two sheets of Chinese tracing-cloth or paper. 26205.
- BULLOCH, Mrs. (See under National Society of the Daughters of the American Revolution.)
- BULLOCK, EDGAR (Guiney's, Va.). Stone implement from Virginia. 26310.
- BUREAU OF AMERICAN REPUBLICS (Washington, D. C.), through William E. Curtis. Two skins of motmots (*Momotus parensis* Sel.) from Para, Brazil, collected by Capt. Sawyer, U. S. Army. 26783.
- BURGER, PETER (Washington, D. C.). Bat (*Adelonycteris fuscus*). 26002.
- BURNHAM, WILLIAMS & Co. (Philadelphia, Pa.). Framed photograph of engine No. 385, Central Railroad of New Jersey, which made a mile run in 39 $\frac{1}{2}$  seconds. 25921.
- BURNS, FRANK (Washington, D. C.). Fossil coquina from the Upper Eocene formation, Vicksburg, or white limestone group (26214); specimen of selenide of mercury (*Tiemannite*) from near Marysvale, Utah (26557). (See under Interior Department. U. S. Geological Survey.)
- BURROWS, D. B. (Lacon, Ill.), through Capt. Charles E. Bendire, U. S. Army. Skin of Mexican black hawk, *Urubitinga anthracina*, from Starr County, Tex. 26178.
- BUTTKOFER, DR. J. (Rejks Museum, Leiden, Holland). Ten specimens of birds' skins, chiefly *Ploceida*, representing 10 species, from Liberia, Africa. Purchase. 27040.
- BYERS, Hon. S. H. M. (U. S. consul-general, St. Gall, Switzerland). Two Swiss alpine horns. Purchased for the World's Fair. 26757.
- CADLE, W. W. (Harrisburg, Pa.). Collection of African ethnological objects. Purchase. 26446.
- CALCUTTA BOTANIC GARDEN (Calcutta, India), through Dr. G. King, superintendent, transmitted by Consul-General Samuel Merrill, of Calcutta. A valuable collection of plants (25983); herbarium specimens (27112).
- CALL, DR. J. S. (U. S. Revenue Marine steamer *Bear*, Unalashka, Alaska). Collection of birds' eggs, consisting of 17 specimens, representing 6 species; also bird's nest. 26150.
- CAMERON, JOHN (Washington, D. C.). Twenty-three ribbon badges of the G. A. R. (26559); collection of badges and medals of the G. A. R. and other patriotic organizations in the United States, and decorations of the Legion of Honor and other military and civic European orders (26203). Deposit. Returned.
- CAMERON, S. T. (Washington, D. C.). United States Springfield muzzle loading musket with flint-lock altered to a breechloader. 26112.
- CANFIELD, MR. (Washington, D. C.). Staghound, in the flesh. 26334.
- CANTERBURY MUSEUM (Christchurch, New Zealand), through P. W. Hutton, curator. Three species of ophiurans, and 6 species of starfishes. Exchange. 26947.
- CANUTE, JAMES (Jacksonville, Fla.). Specimen of *Scyllarus aequinoctialis* (Fabr.) found near Cape Florida. 26062.
- CARACIOLO, H. (Port-of-Spain, Trinidad, West Indies), through Prof. C. V. Riley. Lizard (*Auolis bifurcatus*). 27092.

- CARACRISTI, C. F. Z. (Washington, D. C.). Specimen of marble from Scott County, Va. 26457.
- CARDEZA, DR. J. M. (Claymont, Del.). Specimen of cleavage feldspar from Brandywine Summit, Delaware County, Pa. Exchange. 26503.
- CARPENTER, J. S. (Paymaster U. S. Navy). Skeleton and skull of sea-cow (*Rhytina gigas*). Purchase. 26094.
- CARY, WILLIAM B. (North Stonington, Conn.). Letter of Gen. J. E. P. Stuart, dated June 20, 1862, to Hon. George W. Randolph, Secretary of War of the Confederate States, recommending Lieut. J. S. Mosby for commission of captain. 26270.
- CAULFIELD, W. L. (Cloppers, Md.). Eggs of hog-nose snake. 26240.
- CENTRAL NEW YORK NAVAL VETERAN ASSOCIATION. (Amsterdam, N. Y.), through F. W. Rawdon. Badge and button of the National Association of Naval Veterans. 26679.
- CHAMBERLAIN, DR. L. T. and MRS. FRANCES LEA (Philadelphia, Pa.). Specimens of *Unionida* from Asia and Africa, representing all varieties, many of which are new. 27001.\*
- CHAMBERS, W. N. (England). Pair of gaiters and a pair of overshoes. 27058.
- CHANLER, WILLIAM ASTOR (through Hon. Winthrop Chanler, of New York City). Thirty-seven mounted heads of large game from Masailand, East Africa, collected by Mr. Chanler (deposit) (26908); collection of ethnological objects, dry and alcoholic insects, alcoholic specimens of *Ambassis Commersonii* and *Pterophthalmus Koelreuteri*, collected by Gustav Denhardt at the Island of Lamu, East Africa; specimens of lichens (*Usnea angulata* Ach., *Theloschistes flavicans* Wallr., and *Parmelia perforata* (Ach) Jacq.); 3 crabs, a shrimp, and earth worms, collected by Gustav Denhardt; specimen of *Ampullaria* sp. und., and a specimen of *Achatina acuta* Ferussac from the Tana River, East Africa; 3 specimens of sand, either loose or slightly consolidated and more or less strained by iron oxides, specimen of rare bat (*Vesperugo Rendalli*), and a new species of *Eliomys* (*Eliomys parvus*, True), also a new specimen of mouse (*Mus tana* True); collection of alcoholic reptiles. (26939).
- CHANLER, HON. WINTHROP. (See under William Astor Chanler.)
- CHATELAIN, HÉLI (New York City). Collection of ethnological objects and articles illustrating the house and industrial life of the negro tribes of Angola (purchase) (26802); reptiles, marine shells, 13 specimens of woods and alcoholic specimens of insects from Loanda, West Africa, and alcoholic specimen of flying-fish, *Ecocectus* from near St. Thomas Island (26803).
- CHERRIE, GEORGE K. (National Museum, San José, Costa Rica). Nest and 3 eggs (1 set) of *Giraud's* flycatcher, nest and 3 eggs (1 set) of yellow-green vireo, both new to the collection. 26382. (See under National Museum of Costa Rica.)
- CHRISTIE, JAMES C. (Scotland). Three photographs of meteoric iron. 27043.
- CLAFLIN, E. K. (Wichita, Kans.). Specimen of salt and barite. 25960.
- CLAMPITT, JOHN A. (See under Fish Commission. U. S. Life-Saving Service, and Treasury Department.)
- CLARK, JOHN A. (See under Mrs. James Grimshaw.)
- CLARK, JOHN H. (New Orleans, La.). Manuscript: "Daguerreotyping in old times." 26556.
- CLARKE, Prof. F. W. (U. S. Geological Survey). Drillings of meteoric iron from Pulaski County, Va. 26604. (See under L. H. Igelström and Interior Department. U. S. Geological Survey.)
- CLEVELAND, Rev. E. F. X. (Dundee, Ill.). Thirty-six photographs of Mexican scenery (27061); 10 photographs of native Mexicans (27136).

\* These specimens were purchased from a fund contributed by Dr. and Mrs. Chamberlain to complete the Isaac Lea collection in the National Museum.



- CLISBY, Capt. (See under Capt. J. O. Spicer.)
- CLOSE, A. J. (Dulinsville, Va.). Specimen of great leopard moth, *Epantheria scribana*. 25969.
- COHEN, Rev. HENRY (Galveston, Tex.). Ritual of the Day of Atonement in Marathi (deposit) (26060); Jewish Propitiatory Prayer in Marathi, Jewish New Year's Prayer in Marathi, Jewish daily prayers—Spanish, Jewish prayers for New Year's and Day of Atonement—Spanish (deposit) (26095); Jewish cornet (shofar) (deposited for World's Columbian Exposition) (26130).
- COLBURN, Mrs. ROLLINSON (Washington, D. C.). Portrait of Seminole Indian, supposed to be that of Osceola, painted by King. Purchase. 26582.
- COLE, F. H. (Hot Springs, S. Dak.). Six fossil eyead trunks. Purchase. 27013.
- COLE, G. M. (Washington, D. C.). Engraving by Ormsby of Turnbull's oil painting, "Declaration of Independence." Purchased for World's Columbian Exposition. 25926.
- COLEMAN, J. I. (Aqua Fria, Ariz.). Larva of swallow-tail butterfly, *Papilio turnus*. 26159.
- COLLETT, Dr. R. (See under Zoological Museum of Christiania, Norway.)
- COLLINS, HORACE F. (Tucson, Ariz.). Specimen of Gecko (*Coleonyx variegatus*) from Cañon del Rio, Pinal County, Ariz. 26685.
- COLSON, EUGENE H. (New York City). Shells found on Mosquito coast, and 2 caps made of palm from Nicaragua. 26997.
- COLUMBIAN HISTORICAL EXPOSITION (Madrid, Spain), through Department of State. Bronze commemorative medal conferred by the Columbian Historical Exposition at Madrid, 1892, in recognition of the exhibit of the U. S. National Museum. 26990.
- COMSTOCK, CHENEY & Co. (Ivoryton, Conn.). Collection illustrating the manufacture of elephant ivory (gift) (26601); elephant's tusk for World's Columbian Exposition (lent) (26602).
- CONGE, B. M. (New York City). Elephant tusk from West Africa. 26771.
- CONNOR, EARL (Eastland, Tex.). Specimen of spider (*Phidippus s-punctatus*). 25913.
- CONNOLLY, E. (See under J. B. Aiken.)
- COOKE, Lieut., U. S. Army. (See under Smithsonian Institution. Bureau of Ethnology.)
- COOKE, A. C. (Fort Recovery, Ohio). Tooth of hippopotamus, carved by a native from Mayomba, southwestern coast of Africa, and specimen of silkworm (*Telca polyphemus*). 25980.
- COOKE, Dr. CLINTON T. (Minneapolis, Minn.). Eight eggs (2 sets) of little fly-catcher, *Empidonax pusillus*, from near Salem, Oreg. 26169.
- COOPER, Dr. J. G. (See under Academy of Sciences, San Francisco.)
- COPP, J. B. (Chicago, Ill.). Articles of wearing apparel worn by Mr. Copp's ancestors during the years 1760-1800. 27081.
- COOPER, W. B. (Washington, D. C.). Medal badge, "First Defenders, Washington, 1861." 26261.
- COQUILLET, D. W. (See under Department of Agriculture.)
- CORNELL UNIVERSITY (Ithaca, N. Y.). Rocks from Magnet Cove, Hot Springs, Ark. Exchange. 26659.
- CORY, CHARLES B. (Boston, Mass.). Twenty-six specimens, representing 14 species of birds' skins, principally from Tobago and Grand Cayman, West Indies. 26624.
- COSSMANN, M. (Paris, France). Fossils from the Paris Basin, France. Exchange. 26425.
- COUES, Dr. E., U. S. Army. (Washington, D. C.), through James Whyte. Specimens of whooping crane, *Grus americana*, in the flesh, from Texas. 26633.
- COVILLE, F. V. (Department of Agriculture). Vegetable products from California. 26195.
- COYNE, P. J. (Greaterville, Ariz.). Stone resembling the conical pipes common on the California coast. 26020.

- COX, PHILIP (St. John, New Brunswick, Canada). Four specimens of a cryprinoid fish (*Conesius prosthemius*) from Loch Lomond, near St. John, (27086); alcoholic specimens of fishes (*Phoxinus* and *Semotilus atromaculatus*) (28080); 2 specimens of winninish (*Salmo salar*, var) from Loch Lomond (27127).
- COX, P. E. (Franklin, Tenn.). Eight arrow-heads and a perforator (26881). (See under W. E. Cullum.)
- COX, W. V. (U. S. National Museum). Specimen of rhinoceros beetle, *Dynastes tityus*, from Brightwood (25916); 10 photographs (26063).
- CRAM, JACOB (Sheldrake, N. Y.), through Fish Commission, U. S.) Alcoholic specimen of "mud-puppy," *Necturus maculatus*, from Cayuga Lake. 25972.
- CRAWFORD, JOHN B. (Swanville, Ind.). Specimen of Luna-silk-moth. 26976.
- CREW, H. W. (Hardin Valley, Tenn.). Pileated woodpecker, in the flesh. 25907.
- CRITES, GEORGE W. (See under W. W. Scott.)
- CROSBY, F. W. (Washington, D. C.). Specimens of hematite from the Isle of Elba (purchase) (26869); 2 columns of basalt from Bonn, Prussia (purchased for the World's Columbian Exposition) (26889); collection of geological materials from Messina, Italy (purchased for the World's Columbian Exposition) (27015); collection of volcanic material from Italy and adjacent islands (gift) (27065). (See under Dr. Krantz.)
- CROSBY, Prof. W. O. (Massachusetts Institute of Technology, Boston, Mass.). Specimens of Cumberland iron ore from Newport, R. I. (26288)\*; specimens of clay and concretions from Croton Point, N. Y. (26289)\*; geological material from Frye's Hill, Lebanon, N. Y. (26290)\*; glacial material from Mount Washington (26291)\*; glacial material from the Catskill Mountains (26292)\*; specimens of clay from New Windsor, near Newburg, N. Y. (26293)\*; specimens of pegmatite and kaolin from Blanford, Mass. (26294)\*; iron ore and hard asbestos from Tilly Foster mine, Tilly Foster, N. Y. (26295)\*; calcareous cement, cut on Fitchburg railroad, near Pownal, Vt. (26296)\*; glacial material (26297)\*; geological material from Narragansett Bay (26298)\*; granite fragments from Cape Ann, Mass. (26299)\*; specimens of zinc, iron, and manganese ore from Brandon, Vt. (26300)\*; stratified clay from Gardiner, Me. (26301)\*; glacial material from Buffalo, N. Y. (26302)\*; vein material from Port Henry, N. Y. (26303)\*; glacial material from near Buffalo, N. Y. (26304)\*; boulders and clay from New York (26305); specimens of glacial materials (26596)\*; large polished slab of verdantique marble from Roxbury, Vt. (exchange) (26603); through G. P. Merrill, specimen of baltimoreite from Tilly Foster mine, Putnam County, N. Y., collected by Mr. Crosby (26626); photograph negatives of glacial phenomena (26650)\*; 5 photographs of diabase dike at Medford, Mass., showing phases of rock decomposition (exchange) (26884).
- CROSS, WHITMAN. (See under Interior Department. U. S. Geological Survey.)
- CULIN, STEWART (Philadelphia, Pa.). Four packs of American cards and 1 pack of English domino cards (exchange) (25908); set of time-sticks from Hongkong (gift) (26003); "The Waterloo Medal," a quarto illustrated volume, by Isaac Myer, descriptive of the Napoleon medal known as the Waterloo medal (deposit) (returned) (26012); pack of old English playing-cards (gift) (26928); 7 photographs representing objects used in religious observances (27071).
- CULLOM, W. E. (Dickson, Tenn.), through P. E. Cox. Discoidal stone from Tennessee. Deposit. 26882.
- CUNNINGHAM, BURTON L. (Fort Klamath, Oreg.). Lepidoptera. 26157.
- CURTIN, Hon. JEREMIAH (Queenstown, Ireland). Photograph of an Irish quern, or hand-mill. 27117.
- CURTIS, WILLIAM E. (See under Bureau of American Republics.)
- CUSHING, F. H. (Bureau of Ethnology). Parts of aboriginal weaving (deposited for World's Columbian Exposition) (26513); rabbit-skin robe (gift) (26963).

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\* Purchased for World's Columbian Exposition.

- CUTLER, H. D'B. (Glenwood, Mo.). Hen's egg. 26848.
- DALL, W. H. (See under Interior Department. U. S. Geological Survey; and J. D. Mitchell.)
- DALSHEIMER, SIMON (Baltimore, Md.). Photographs of paintings illustrating Jewish ceremonies (26954); arba Kanforth—Jewish ceremonial garment (26165).
- DANA, Prof. E. S. (See under Yale College.)
- DANIEL, F. M. (Mammoth Spring, Ark.). Moths. 25971.
- DANIEL, Prof. E. (Omaha, Nebr.). Shells, plants, woods, minerals, rocks, and soils from Mexico. 27131.
- DANIELS, L. E. (Morris, Ill.). The counterpart of type of *Neuropteris Clarksoni*, Lx., var. *minor* D. W. 26966.
- DANIELS, WILLIAM H. (Fairhaven, Wash.). Two specimens of *Rosalia funebris*. 26052.
- DAVIS BROTHERS (Diamond, Ohio). Two stone implements from Mahoning County and 1 from Portage County. 26621.
- DAWES, Mrs. W. C. (Tip Top, Ariz.) Red mite (*Trombidium*, sp). 26125.
- DAY, Dr. DAVID T. (See under Charles de Struve.)
- DEMING, N. L. (New York City). Specimen of tree-cricket, *Ocanthus bipunctatus*, De Geer. 26190.
- DENHARDT, GUSTAV. (See under William Astor Chanler.)
- DESERET MUSEUM (Salt Lake City, Utah), through J. E. Talmage. Selenite from the southern part of Utah (gift) (26768); selenite crystals (exchange) (27087).
- DE STRUVE, Mr. CHARLES (Envoy Extraordinary and Minister Plenipotentiary from Russia), through Dr. David T. Day. Cinnabar from Ekaterinoslav, Russia. 26089.
- DETROIT AND CLEVELAND STEAM NAVIGATION COMPANY (Detroit, Mich.). Framed picture of steamer *City of Detroit*. 26342.
- DEUTSCH, Prof. G. (Hebrew Union College, Cincinnati, Ohio). Manual of domestic devotion (Hebrew in manuscript). Lent for World's Columbian Exposition. 26616. Returned to owner.
- DEVEREUX, Mrs. (See under National Society of the Daughters of the American Revolution.)
- DIVINE, WILLIAM (San Antonio, Tex.). Vegetable substance resembling cotton from mountains in San Luis Potosi. 26495.
- DEXTER, LEWIS (U. S. consul, Fayal, Azores). Shells, crustaceans, worms, sea-urchins, starfishes, and other marine invertebrates (26026); alcoholic specimen of *Trochosa madeirana*, alcoholic and dry marine invertebrates, and alcoholic mollusks (27016); 60 dried specimens of starfishes, alcoholic starfishes, sea-urchins, and specimens of *Scyllarus* (27129).
- DEYROLLE, EMILE (Paris, France). Series of models showing development of fowl. Purchased for World's Columbian Exposition. 26664.
- DICKEY, F. W. (East Smithfield, Pa.). Specimen of *Spirifera disjuncta*. 26886.
- DILLE, FREDERICK M. (Denver, Colo.). Eggs of American magpie, showing variation in size, shape, and color. 26761.
- DILLER, Dr. J. S. (See under Interior Department. U. S. Geological Survey).
- DILYARD, ALBERT (Fredericksburg, Ohio), through I. Greeger. Primitive lamp. 26019.
- DISMUKES, G. W. (St. Augustine, Fla.). Specimen of sphinx-moth, *Charocampa tersa*. 26226.
- DODGE, Mrs. K. T. (Fort Bayard, N. Mex.). Coleoptera (*Eleodes longicollis* and *Prionus californicus*). 26152.
- DORSEY, Rev. J. OWEN. (See under Mrs. Helen McMurdy.)
- DOW, Mrs. E. K. (New York City). Seven skins of Paradise trogon, *Pharomacrus Moccini*, from Guatemala. Purchase. 27125.
- DOWNES, A. C. (Realitos, Tex.). Armadillo, in the flesh (purchased for World's

- Columbian Exposition) (26079); specimens of cactus for armadillo group (for World's Columbian Exposition) (26082); armadillo, in the flesh (purchase) (26098).
- DRESSER, H. E. (London, England). Four birds' skins, from India and Korea. Exchange. 25966.
- DUBOIS, JAMES T. (Washington, D. C.). Ochre from Patuxent Camping Ground, Anne Arundel County, Md. 27046.
- DUGÈS, Prof. A. (Guanajuato, Mexico). Eel, *Symbranchus* sp., from Tapijulapa River (26707); 2 specimens of *Penaeus setiferus*, 2 specimens of *Pseudothelphusa*, and 1 specimen of *Cambarus* (27048). (See under William Hampton Patton.)
- DURAND, JOHN (Paris, France). Seventeen plaster casts of objects representing Greek, Roman, and Assyrian religious observances. Purchased for World's Columbian Exposition. 26818.
- DURDEN, HENRY S. (San Francisco, Cal.). Aragonite "onyx marble" from Sulphur Creek, Colusa County, Cal. 26588.
- DU BUYSSE, II. (Chateau du Vernet, per Brout-Vernet (Allier), France). Seventy-one species of European diptera, hymenoptera, and coleoptera. Exchange. 26181.
- EASTERBROOK, F. D. (Warren, R. I.). Water-worn pebble. Deposit. 27100. Returned.
- EDWARDS, B. M. (Marshall, N. C.). Specimens of rhinoceros beetle, *Dynastes tityus*. 26156.
- EDWARDS, J. (Ramelton, Ind.). Stag-beetle, *Lucanus claphus*. 26438.
- EDWARDS, VINAL N. (Wood's Holl, Mass.) Alcoholic specimens of Spanish sardine (*Clupea pseudohispanica*). 26351. (See under Fish Commission, U. S.)
- EGLSTON, Dr. T. (Columbia College, New York City). Limonite carving from Japan. Purchase. 26514.
- ELLIOTT, WILLIAM F. (DeKalb, Ill.). Powder-horn. Deposit. 26455.
- ELLIS, C. C. (acting consular agent, Rangoon, India). Collection of Burmese musical instruments and 2 photographs; 2 Burmese games. 26703.
- ELROB, Prof. M. J. (Des Moines, Iowa). Birds' skins. Exchange. 27126.
- ELSON, A. W. & Co. (Boston, Mass.). Photogravure "Portrait of Washington," after Stuart. 26717.
- ELVIN, R. J. (Indianapolis, Ind.). Two original parchment commissions of U. S. land officers, signed by President John Quincy Adams and President James Madison; also a series of State bank notes, national fractional paper money, and Confederate States paper money. Deposit. 26413.
- EMERSON, B. K. (See under Interior Department. U. S. Geological Survey.)
- EMERSON, CHARLES H. (Whitehall, N. Y.). Four boomerangs, and boomerang gun. 26725.
- EMMETT, Mrs. R. A. (London, England). Model of rockweed for octopus group (26868); skin of Swallow (*Helidon rustica*) from England (27039). Purchased for World's Columbian Exposition.
- EMMONS, Lieut. G. T., U. S. Navy. "Steel" for strike-a-light, from Sitka, Alaska, illustrating one of the kind made by the Russians for trading (26453); photograph of Upper Lake doctor with his wives, and horn spoon of the Tlingit Indians (26494); unhairing tool used by the Tlingit Indians (27063).
- EMMONS, S. F. (U. S. Geological Survey). Twenty-five specimens of cretaceous and eocene fossils from Lower California. 27057.
- ENGLISH, F. H. (Colfax, Wash.). Horn-tail (*Tremar columba* Fab.). 26031.
- ENGLISH, GEORGE L. & Co. (New York City). Slab of grossularite and vesuvianite in calcite from Morelos, Mexico, pyroxene in calcite from St. Lawrence County, N. Y., agate from Brazil, smoky quartz from St. Gothard, Switzerland, 3 specimens of eroidolite quartz from Griqua Land, South Africa, and a specimen of prehnite from New Jersey. (26540); 3 cut stones of willemite from New Jersey,

calcite from Egremont, Cumberland, England, and sphalerite from the same locality (26586); stalactites from Copper Queen Mine (26861). Purchased for World's Columbian Exposition.

ESLICK, JAMES A. (Helena, Mont.). Frog. 26597.

EVANS, J. M. (Kentucky). Rhinoceros-beetle, *Dynastes tityus*. 26359.

EVANS, W. H. & SON, (Knoxville, Tenn.). Marble from Champion and Knox quarries, also rain-eroded limestone and cement rock from near Knoxville, collected by Mr. George P. Merrill. 25951.

EVERMANN, Prof. B. W. (U. S. Fish Commission). Three eggs (1 set) of European snipe, sets of eggs of pintail-duck, Lapland-longspur, and sandwich-sparrow from Alaska (26658); 4 specimens of *Etheostoma Shumardi* from Indiana, 4 specimens of *Etheostoma crides* from the same locality, and 4 specimens of *Aphredoderus Sayanus* from Texas (26789). (See under Fish Commission, U. S.).

FALCONER, J. M. (Brooklyn, N. Y.). Ball of etching ground (part) wrapped in silk, and a silk dapper for laying ground. 26170.

FARRINGTON, O. C. (Arlington Heights, Mass.). Photograph negative of glacial phenomena in Massachusetts (26660); glacial pot-hole (27079). Purchased for World's Columbian Exposition.

FEA, L. (Museo Civico di Storia Naturale, Genoa, Italy). Collection of mammal skins. Purchase. 27003.

FERNALD, Prof. C. H. (Amherst College, Amherst, Mass.). Type specimen of *Choreutes coloradella* fern. 26693.

FEWKES, J. WALTER (Boston, Mass.). Photographs illustrating Moki ceremonies. 27102.

FIGGINS, J. D. (Washington, D. C.). Box-turtle from Maryland. 27031.

FISH COMMISSION, U. S.:

Through Col. Marshall McDonald, Commissioner: Amber-fish, *Seriola Lalandi*, from Wood's Holl, Mass. (25909); collection of alcoholic actinians made by steamer *Albatross* during the voyage from Washington to San Francisco, 1887-1888\* (25924); 11 specimens, representing 3 species, of crustaceans from North Carolina, collected by Dr. Hugh M. Smith during April, 1892 (25973); builders' model of steam-yacht (deposit) (26092), builders' model of steam-launch (deposit) (26093), skull of sturgeon (26264); fur seal from St. Paul Island, Alaska (male); Steller's sea-lion from Light-house Rocks, Alaska, and skull of walrus and bones collected in the summer of 1890 by the steamer *Albatross*; lithological specimens from Herendeen Bay, Alaska, collected by the *Albatross*; fossil shells and fossil plants† from Herendeen Bay, collected by Mr. Charles H. Townsend of the *Albatross* (26375); shells from Guadalupe Island, Lower California, collected during the cruise of the schooner *Santa Barbara*, under charge of Mr. Charles H. Townsend; volcanic rocks, adult male and female sea elephant and young male, collected from the same locality and during the same cruise (26376); 40 specimens, representing 25 species, of birds' skins from South Dakota and Wyoming, collected by Prof. B. W. Evermann; 12 mammal skins from South Dakota, including 2 specimens of *Cynomys*, 3 specimens of *Sciurus*, 4 specimens of *Tamias*, one specimen of *Mus*, and 2 specimens of *Neotoma*, also collected by Prof. Evermann (26449); 6 specimens of young sturgeon (*Acipenser sturio*) from the Delaware River (26461); types of marine fishes from the collections of the Fish Commission, described by Dr. David S. Jordan and Prof. Charles H. Gilbert; fishes collected by U. S. Fish Commission schooner *Grampus* from the Gulf of Mexico (26479); collection of fishes made by the *Grampus* on the

\* This collection is described in Proceedings U. S. National Museum, Vol. XVI, 1893, p. 119.

† A report on the specimens is published in Proceedings U. S. National Museum, Vol. XVII, 1894, p. 207.

tile-fish grounds, during the summer of 1892, consisting of *Squalus acanthias*, *Scylliorhinus retifer*, *Conger conger*, *Phycis tenuis*, *Phycis chuss*, and *Merluccius bilinearis* (26552); crustaceans obtained chiefly by the steamer *Albatross* in the North Pacific Ocean \* (26567); type specimens of 27 new species of fishes collected by the *Albatross* in the Pacific Ocean, principally off the coast of Lower California (26574); water-snake, *Natrix*, collected by Dr. Henshall in west Florida (26669); alcoholic specimens of reptiles and batrachians collected in Iowa, Nebraska, and South Dakota by Prof. B. W. Evermann (26699); skin and skeleton of California sea-lion, *Zalophus*, obtained by the steamer *Albatross* in San Luis Gonzales Bay, Gulf of California (26710); 31 specimens of birds' skins collected by Mr. C. H. Townsend and Prof. Evermann in Alaska during the cruise of the *Albatross* in the summer of 1892 (26739); 11 specimens of Pacific coast fishes from the collections of the *Albatross*, consisting partly of the types of new species described by Prof. C. H. Gilbert, comprising *Icelinus varifrons* G.; *Citharichthys fragilis* G.; *Citharichthys xanthostigma* G.; *Icelinus filamentosus* G.; *Symphurus fasciolaris* G.; *Plectobranchus erides* G.; *Ilyophis brunnus* G.; *Zaniolepis frenatus* Eigenmann; *PlatyGLOSSUS dispilus* Günther; *Chaenomugil proboscideus* Günther (26745); 2 specimens of grunt and a parrot-fish (26766); specimen of lumpfish (*Cyclopterus lumpus*) captured by John A. Clampett, keeper of life-saving station at Lewes, Del. (26840); bronze commemorative medal conferred by the Columbian Historical Exhibition at Madrid, 1892, in recognition of the exhibit of the U. S. Fish Commission (deposited by the Fish Commission) (26987.)

Through Richard Rathbun, Acting Commissioner: Eggs of conch-shell and a collection of pressed plants, lichens and mosses, obtained by Prof. B. W. Evermann from Alaska during the summer of 1892, while engaged as naturalist on steamer *Albatross* (26822); specimens of pteropods and heteropods collected by the *Albatross* during the voyage from Norfolk to San Francisco in 1887-1888 (26961).

Through Dr. T. H. Bean: Alcoholic specimens of fishes used in connection with the exhibit for the World's Columbian Exposition (26792); 34 birds' skins, representing 16 species, collected by Vinal Edwards at Wood's Holl, and alcoholic specimen of reptiles collected by Theodor Holm (26820).

Through Mr. Barton A. Bean: Land and fresh-water shells, representing 6 species, from Spokane, Wash. (26788). (See under Jacob Cram, W. C. Harris, and William Ross Harris.)

FISHER, Dr. A. K. (Department of Agriculture). Four hundred and ninety-six specimens (157 sets) of birds' eggs, and 19 nests. 26531. (See under Department of Agriculture.)

FISHER, John (Deer Lodge, Mont.). Specimen of beetle (*Ergates spiculatus* Lec), 26110.

FLANAGAN, A. H. (Radford, Va.). Black-capped night heron. 26970.

FLECHTER, VICTOR S. (New York City). Harp-lute from England (26427); *Viola d'amore* (26484). Purchased for World's Columbian Exposition.

FLINT, H. W. (New Haven, Conn.). Twenty-eight specimens, representing 7 species of birds' eggs (26173); set of eggs of seaside-sparrow, nest of blue-winged warbler, and nest of short-billed marsh wren (26273).

FLOOD BROTHERS (Malden, Mass.). Eighty specimens of coleoptera, mostly from Tasmania. 26191.

FLÜGEL, Dr. FELIX (Leipzig, Germany). Two volumes and photographic atlas—Mekka, by Dr. C. Snouck Hurgronje. 26242. Purchased for World's Columbian Exposition.

FOOTE, A. E. (Philadelphia, Pa.). Engraved portraits of Chevreul, D'Arcet, Brongniant, and nine other men of science (purchase) (25946); 2 photographs of

\* Specimens identified by J. E. Benedict and Miss M. J. Rathbun, of the National Museum.

- meteoric iron from Cañon Diablo, Arizona (gift) (26144); 18 specimens of minerals from various localities; specimens of spinel, quartz after coral, selenite, celestite, laumontite, hematite, and a slab of hypersthene; specimens of crocoite, native sulphur, and brookite; 32 specimens of minerals from various localities (26539, 26833, 26834, 26875) (purchased for World's Columbian Exposition); specimen of anglesite on galena from Sardinia (gift) (26876).
- FORD, H. CLAY (Washington). Grayhound, *Canis familiaris*, in the flesh. 26806.
- FORD, T. C. (Aberdeen, S. Dak.). Five sketches of stone circles and figures from McIntosh County, N. Dak. 26779.
- FOREST AND STREAM PUBLISHING COMPANY. (See under J. Ridler.)
- FORRESTER, R. (Scotfield, also Castle Gate, Utah). Specimen of *Photadomya Kingii* (26000); fossil plants from the Laramie group (26096); rocks (26411); fossil Ophiuran (26690); 6 specimens of *Chemnitzia Coalvillensis*, Meek? (27054).
- FOWLER, F. HALL (Fort Huachuca, Ariz.). Set of eggs of white-necked raven; set of eggs of scorched horned lark (the latter new to the collection) 26219.
- FOX, WILLIAM J. (Academy of Natural Science, Philadelphia, Pa.). Three type specimens of *Odynerus Aldrichii* Fox (gift) (26952); 64 specimens, representing 19 species of hymenoptera, 6 species of hemiptera, and 3 species of diptera from Jamaica (exchange). (26274.)
- FRANCIOLETTI, LEOPOLD (Florence, Italy). Collection of musical instruments. Purchase. 26256.
- FRANCIS, JOSEPH (Minneapolis, Minn.). Books and papers pertaining to Mr. Francis' inventions and travels. 26760.
- FRAZAR, G. B. (West Medford, Mass.). Three hundred archeological objects consisting of rude and leaf-shaped implements, arrow and spear-heads, hammer-stones, rubbing-stone, broken hatchet and pebbles slightly worked from Blackman's Point, Marshfield, Mass.; also small, rude, chipped implements, worked flakes, and other objects from "Goat's Acre," Arlington, Mass.; specimen of peat and piece of volcanic rock, two specimens of chabazite and stilbite from Nova Scotia. Exchange. 26569.
- FREDD, JOHN J. (Pottstown, Pa.) Specimens of "ringing rocks" from Montgomery County, Pa. 26217.
- FREELAND, JOHN J. (Washington). Copper mold for making pewter spoons, supposed to be over 80 years old. 26599.
- FRIEDENWALD, DR. A. (Baltimore, Md.). Kiddush cloth. 26371.
- FRIES, DR. T. (See under University of Upsala.)
- FRY, MRS. H. L. (New York City). Cane used by Ebenezer Fry, a soldier of the Revolution, who was wounded at the battle of Bunker Hill, June 17, 1775. 26776.
- FULTON, HUGH (London, England). Two beetles (purchase) (27020); shells, representing 25 species (exchange) (27123).
- GABEL, T. R. (Albuquerque, N. Mex.). Three specimens of onyx marble. 26684.
- GABRILL CHICAGO PORTRAIT AND VIEW COMPANY (Chicago, Ill.). Eight photographs representing volcanic phenomena. Purchased for the World's Columbian Exposition. 26155.
- GANTER, H. C. (Mammoth Cave, Ky.). Cave materials from the Mammoth Cave, collected by George P. Merrill for the World's Columbian Exposition (26154); 3 large and 1 small blind-fish, *Amblyopsis spelaeus* (26794).
- GATSCHEK, DR. A. S. (Seneca, Mo.). Modoc bow and arrow made by Sam Modoc, of Quapaw Reservation. 26323. (See under Smithsonian Institution. Bureau of Ethnology.)
- GEOLOGICAL SURVEY OF TEXAS (Austin, Tex.), through J. A. Singley. Shells (26613); land-shells, representing 10 species, identified by Dr. Sterki (26813); fresh-water shells (26360).
- GEORGE, W. A. (Förney, Tex.). Four specimens of an undetermined species of *Spharulites*, and 1 specimen of *Ananchytes terana*, Cragin. 27139.

- GERRARD, EDWARD (London, England). Three specimens representing 3 species of game birds (purchased for World's Columbian Exposition) (25996); 3 specimens of reptiles and amphibians (purchase) (26858).
- GIGLIOLI, Prof. H. H. (Royal Museum, Florence, Italy), through Dr. G. Brown Goode. Two alcoholic specimens of scopeloid fishes (*Myctophum metapocampum* and *M. Gemellari*), from the Mediterranean Sea. 25925. (See under Royal Museum, Florence, Italy.)
- GILBERT, Prof. CHARLES H. (Leland Stanford Junior, University, Palo Alto, Cal.). Skull of common porpoise (*Delphinus delphis*). 26736. Returned. (See under Fish Commission, U. S.)
- GILCHRIST, F. C. (Fort Qu Appelle, Canada). Alcoholic specimens of *Salmo mykiss*, *Salvelinus malma*, *Coregonus tulliber*, *Coregonus Williamsoni*, *Pogonichthys Pimephales*, and *Eucalia inconstans*. 26972.
- GILMAN, Dr. C. (See under Johns Hopkins University.)
- GLENN, ROSCOE H. (Plankinton, S. Dak.). Specimens of miscellaneous insects from South Dakota. 26890.
- GODBEY, S. M. (Chapel Hill, Tex.). Shells from Texas and California (26852, 26979).
- GODDING, Dr. W. W. (Washington, D. C.). Copperhead-snake, *Ancistrodon contortrix*. 25920.
- GOODE, Dr. G. BROWN (Assistant Secretary, U. S. National Museum). Decoration of the Legion of Honor of France, with crown and fleur-de-lis, as conferred during the Empire, and decoration of the Austrian Order of the Iron Crown (25906); New York Recorder solargraph (26037); musical instruments from Genoa, Italy (26410); 2 pair of castanuelas from Madrid, Spain; guallo and aborro from Granada; 5 perritos from Madrid (26532); string of imitation elk-teeth made from shells (26536); 3 dial compasses from Burgos, Spain, representing the time-pieces used there at present (purchased) (26543); a series of medals conferred for military service in Belgium, Italy, and Spain, and decoration of Belgian military order under Leopold in 1830, including Cuban Spanish campaign, 1873; Alfonso XII; Defenders of Bilbao; Pope Pius IX; Military Merit Medal of Belgium; Belgian Order, 1830; (26647); specimen of pine-mouse, *Arriicola pictorum*, from Lanier Heights (27149); Dulzama, from Biarritz, France. (See under Prof. H. H. Giglioli.)
- GOWARD, G. (Chicago, Ill.). Three specimens of Korean pine nuts and one of tobacco. 26341.
- GRANT, LOUIS B. (vice consul-general, Cairo, Egypt). Skin, skull, and leg-bones of Egyptian buffalo (purchased for World's Columbian Exposition) (26723); collection of Egyptian musical instruments (purchased for the National Museum by Mr. Grant at the request of the Secretary of the Smithsonian Institution) (25998).
- GREGOR, ISAAH (Cuyahoga Falls, Ohio). Five-barreled pistol, patented in 1849 (deposit) (26515); 2 alcoholic specimens of *Murex fulvescens* and 5 marine-shells showing pathologic growth, mostly from Florida and the West Indies (26989); 4 specimens of shells showing interesting pathologic characters (26991). (See under Albert Dilyard.)
- GREGORY, JAMES R. (London, England). Photograph of the large Youndegin meteorite (meteoric iron) found at Youndegin, western Australia, in 1891. 27034.
- GREEN, ERNEST S. (San Diego, Cal.). Stalactite needles from Fort Stanton Cave, Lincoln County, N. Mex. 26078.
- GREENE, A. S. (U. S. Navy). African spear. 26222.
- GREENE, F. W. (Washington, D. C.). Pair of antlers of moose (*Alces machlis*). Deposit. 26790. Returned.
- GRIDER, R. A. (Canajoharie, N. Y.). Collection of water-color sketches of historic powder-horns (26510); 30 sheets of water-color paintings of powder-horns (26639). Deposit.



- GRIERSON, A. R. (Ellsberry, Ohio). Monticuliporoid coral growing on a gasteropod. 26821.
- GRIFFIN, M. R. (Fredericksburg, Va.). Skin of muskrat and 2 skins of woodchuck. 26077.
- GRIMSIAW, Mrs. JAMES (New Orleans, La.), through John A. Clark. An original daguerreotype of John James Audubon, taken at the age of 81 years. Deposit. 25915.
- GROTH, Prof. P. (See under Munich Academy, Munich, Bavaria.)
- GÜNDLACH, Dr. J. (Puentes Grandes, Havana, Cuba). Specimen of *Agelaius assimilis* (desiccated) from the Isle of Pines, Cuba. 27148.
- GUNTHER, C. F. (Chicago, Ill.). Etching and photograph of Columbus' portrait by Sir Antonio Moro. 26493.
- GURLEY, Dr. R. R. (U. S. Fish Commission). Specimens of fishes from Four Mile Run, Carlin's, Virginia, consisting of *Noturus*, *Rhinichthys*, *Catostomus*, *Phoxinus*, and *Notropis*. 26576. (See under E. O. Ulrich.)
- GURLITT, FRITZ (Berlin, Germany). Ten casts of Tanagra figures, illustrating Greek religions. 26944. Purchased for World's Columbian Exposition.
- GUTHRIE, OSSIAN (Chicago, Ill.). Copper drift bowlder (26856); bowlder from glacial drift (26899.) Purchased for World's Columbian Exposition.
- HAINES, BENJAMIN (New Albany, Ind.). Twenty-five photographs of Wyandotte caves (purchased for World's Columbian Exposition) (26128); 34 photographs of the Mammoth Cave, Kentucky, for the World's Columbian Exposition (26306).
- HALDERMAN, Gen. JOHN A. (Metropolitan Club, Washington). Siamese newspaper and story. 26462. (See under Dr. S. J. Smith.)
- HALES, HENRY (Ridgwood, N. J.). Silver-grey dorking fowl (gift) (26564); collection of ancient pueblo pottery and implements (purchased for World's Columbian Exposition) (26917).
- HALLOCK, CHARLES (Goshen, Mass.). Certificate of book copyright issued in the southern district of Georgia, entitled "Confederate States of America," June 13, 1863. 26004.
- HAMLIN, HOMER (San Diego, Cal.). Post pliocene fossils from Coronado Beach, San Diego. 26013.
- HAMMERBACHER & NORRIS (Baltimore, Md.). Pair of shoes. 26478.
- HAMMITT, J. M. (Pittsburg, Pa.). Perforated mussel shell found in what is supposed to have been an old Indian camp or fort. 26515.
- HARRIMAN, D. G. (See under Wyandance Brick and Terra Cotta Company.)
- HARRINGTON, MARK W. (See under Capt. Frank P. Spratt.)
- HARRIS, FRANK (La Crescent, Minn.). Birds' eggs (exchange) (26573); set of eggs of prothonotary warbler (gift) (26636).
- HARRIS, GEORGE A. (Chicago, Ill.). Specimen of cecropia silk-moth. 25892.
- HARRIS, GEORGE E. (Cassville, Mo.). Salamander from Giddis Hollow, Mo. (26045); 17 salamanders (26090); through Dr. L. Stejneger, larva of royal walnut-moth, *Citheronia regalis*, (26161); sand for glass-making (26857); 2 specimens of zinc ore (26883).
- HARRIS, W. C. (New York City), through U. S. Fish Commission. Specimen of little eusk, *Ophidium gravelisi*, from Cedar Keys, Fla. 27140.
- HARRIS, WILLIAM R. (Tyler, Tex.), through U. S. Fish Commission. Unios from Texas (26759); Unios principally from fresh waters of Texas (25987).
- HARRON, L. G. (See under B. A. Bean.)
- HARTMAN, JOSEPH (Pittsburg, Pa.). Three specimens of *Eurygonia iuda* from near New Galilee, Pa. 26100.
- HARVEY, Rev. M. (St. John's, Newfoundland.) Five specimens of Allen's Newfoundland ptarmigan, *Lagopus lagopus Alleni*, and 2 specimens of Welch's ptarmigan, *Lagopus welchi* (26901, 26902).

- HASBROUCK, E. M. (U. S. National Museum). Snake (*Lampropeltis rhombomaculatus*) from Bethesda Park, Md. (26357); 2 specimens of flying-squirrel, *Sciuropterus volucella* (26925); specimen of Henslow's sparrow, *Ammodramus Henslowi*, from the vicinity of Washington, D. C. (27090).
- HASSALL, ALBERT. (See under Department of Agriculture.)
- HAUPT, Prof. PAUL. (See under Johns Hopkins University.)
- HAWKINS, ANDREW. (See under Dr. W. T. Owsley.)
- HAWKINS, A. P. (New York City). English guitar and lyre-guitar. 26512. Purchased for World's Columbian Exposition.
- HAY, W. P. (Washington, D. C.). Salamander (*Hemidactylum scutatum*) from Mount Vernon, Virginia (26314); large conglomeration of clay-cells of the mud-wasp (*Pelopus cementarius*) (26447); alcoholic specimens of *Cambarus pellucidus* from Shiloh Cave, Indiana, and *Cambarus pellucidus Testii* (types) from Mayfield's Cave, Indiana (26992).
- HAYNES, J. E. (Newark, N. J.). Photographs of "Early Settlers Monument" erected by the city of Newark in 1889, in memory of the first settlers of the town in 1666. 26971.
- HAYWOOD, HOWARD (Raleigh, N. C.). Stone implements. 26653.
- HAZEN, JOHN McLEAN (Washington, D. C.). Military uniform, epaulettes, shoulder-straps, sash, field-glasses, and headquarters flag, used by Gen. Hazen; also captured Confederate flags. Deposit. 26913.
- HEARD, AUGUSTINE (U. S. Legation, Seoul, Korea). Twelve musical instruments from Korea. 26255.\*
- HELIOTYPE PRINTING COMPANY (Boston, Mass.). Photolithograph. 26714.
- HEMPHILL, HENRY (San Diego, Cal.). Cuttlefish, with two extra specimens of the endostyle. 26914.
- HENSHALL, Dr. (See under U. S. Fish Commission.)
- HENSHAW, H. W. (Witch Creek, Cal.). Collection of reptiles and batrachians, scorpions and hair-worms (26395); herbarium specimens (27006); stone implement found near Santa Ysabel (27008); rattlesnake, lizards, and a spider (27049); reptiles (27076); nest of *Mgiarchus cinerascens* formed in a stump of a tree (27120); 8 reptiles, 1 specimen each of *Vespertilio nitidus* and *Vesperugo hesperus* (27137). (See under Smithsonian Institution. Bureau of Ethnology.)
- HEROX, A. A. (Lawrence, Mass.). Jacobin pigeon. 26847.
- HEWLETT, S. G. (Eastbourne, Sussex, England). Collection of rude chipped flint implements, worked flakes, scrapers, cores, hammer-stones, broken polished hatchets (retouched), pieces of calcined flint from plowed lands near Brachy Head, South Downs, Sussex, England, also a scraper made of ox-hoof with edge of iron. Exchange. 26537.
- HERRERA, Prof. A. L. (Mexico, Mexico). Two eggs of *Pipilo fuscus*. 26512.
- HILL, Dr. W. SCOTT (Augusta, Me.). Ten fragments of pottery from an Indian fireplace in the vicinity of Augusta. 26076.
- HILLEBRAND, Dr. W. F. (See under Interior Department. U. S. Geological Survey.)
- HITCHCOCK, FRANK H. (Department of Agriculture). Two eggs of *Accipiter velox* from Sandy Spring, Md. (26166); 2 skins of fox-sparrow, *Passerella iliaca* (26832); nest and 3 eggs of yellow-throated vireo from Medford, Mass. (27009).
- HITCHCOCK, ROMYN (Washington, D. C.). Fourteen spectographic photographs made by Mr. Schumann, of Leipzig, Germany, in 1888, with a rough descriptive memorandum of each (26501); æolian dust collected from a house in Tien-Tsin, China, after a dust-storm (26503); clays and paint ores from Pennsylvania (27118).

\* These objects were purchased by Mr. Heard for the National Museum at the request of the Secretary of the Smithsonian Institution.

- HOASE, HUGH P. (National Military Home, Ohio). Tobacco hawk-moth, *Protoparce cecus* Hub. 26030.
- HODGE, F. WEBB (Bureau of Ethnology). Eleven arrows of the Pima Indians of southern Arizona. 26535.
- HODGE, H. G. (York, Ill.). Chrysalis of milk-weed butterfly, *Danais plexippus* (26065); larva of walnut-moth, *Cithronia regalis* (26142).
- HOFFMAN, DR. W. J. (Bureau of Ethnology). Eleven decorations and medals consisting of the Order of the Crown of Steel, of Arancanea; Royal Order of Melusine; Order of Nicalu-et-Iftikhar, of Tunis; Order of the Liberator, of Venezuela; Royal Order of the Crown, of Prussia; Order of the Zachringen Lion, of Baden; Ancient and Illustrious order of St. James, of Portugal; Great Golden Medal of Merit for Science and Art, Austro-Hungary; Royal Norwegian Golden Medal of Merit, with crown, Norway; Royal Ludwig Medal for Science and Art, Bavaria; and Military Medal of Merit for service as Surgeon in Franco-Prussian War. Deposit. 26982.
- HOLLIS, FRED S. (Boston, Mass.). Quartzite boulder from Deerfield River Valley. 26058.
- HOLLIS, George F. (See under H. C. Moore.)
- HOLM, Theodor (Department of Agriculture). Soft-shelled turtle from Eastis, Fla. 26811. (See under U. S. Fish Commission.)
- HOLT, H. R. R. (Takoma Park). Great Dane hound (*Canis familiaris*). 26741.
- HOLZNER, Frank X. (See under Smithsonian Institution. U. S. National Museum and Dr. E. A. Mearns.)
- HÖÖK, FRIDOLF (Vladivostock, Russia); through J. Lyall, acting U. S. consul, Singapore. Stone implements, fragments of pottery, shells, and other objects from Vladivostock. 27089.
- HOPPING, RALPH (Keweenaw, Cal.). Ten specimens of coleoptera (26029); specimens of Californian coleoptera, representing 65 species (26193); Californian coleoptera, representing 47 species (27028).
- HOUSTON, JOSEPH (Cumberland House, Saskatchewan, Canada). Green garnet. 26057.
- HOUGH, WALTER (U. S. National Museum). Four chromolithographic posters of the Madrid Columbian Exposition. 26999. (See under Smithsonian Institution. U. S. National Museum.)
- HOWARD, L. O. (See under J. B. Lambert.)
- HOWELL, E. E. (Washington, D. C.). Minerals and other geological material (exchange) (26127); cleaned skeleton of striped bass, 18 inches long (purchased for World's Columbian Exposition) (26265); 14 specimens of minerals from various localities, consisting of rutile, harmotome, chalcopyrite, marcasite, massive rutile, chrysolite, hyalite, and anhydrite (exchange) (26529); specimen of pink tourmaline in lepidolite from San Diego, Cal. (exchange) (26713); 48 specimens of minerals from various localities (purchased for World's Columbian Exposition) (26827); specimen of rubellite in lepidolite from San Diego County, Cal. (gift) (26828); slab of glacial polished limestone from Rochester, N. Y. (purchased for World's Columbian Exposition) (26938).
- HUBBARD, Mrs. H. G. (Detroit, Mich.). Seventy-two specimens, representing 30 species of coleoptera illustrating the saline fauna of Great Salt Lake. 26032.
- HUBBARD, L. L. (Cambridge, Mass.). Five specimens of noselite and haiyünite from Prussia. 26390.
- HUNTER, Mrs. LIDA (Dayton, Ohio.). Four specimens of fungus-beetle, *Boletophagus cornutus* Fab. 26140.
- HURTER, JULIUS (St. Louis, Mo.). Rattlesnake (26049); 12 specimens of Unios from Missouri, 2 turtles from Missouri, and a salamander from Alabama (26394). Exchange.

HUTTON, F. W. (See under Canterbury Museum.)

IGLESTRÖM, L. J. (Sunnebo, Wernland, Sweden), through Prof. F. W. Clarke. Specimen of friedelite. 26431.

ILLINOIS AND MISSISSIPPI CANAL COMPANY (Moline, Ill.), through G. W. Vinton. Spade with which the first earth was thrown in the construction of the Illinois and Mississippi Canal. 27150.

IMPERIAL AUSTRIAN MUSEUM (Vienna, Austria), through Dr. F. Brauer. Types of 98 species of European *Muscivora*, illustrating Brauer and Bergenstamm's classification. Exchange. 27104.

INDIAN MUSEUM (Calcutta, India), through A. Alcock. Alcoholic specimens of deep-sea fishes from the Bay of Bengal and Andaman Sea (exchange) (26671); through J. Wood Mason, superintendent, specimen of domestic yak (*Bos grunniens*), from Kalinpong, India (purchased for World's Columbian Exposition) (26887).

INGRAM, D. P. (Elmira, N. Y.). Three skins of American flamingo, *Phenicopterus ruber*, from the Bahama Islands. Purchase. 26269.

#### INTERIOR DEPARTMENT:

From J. J. Noah: Original printed copy of the Ordinance of the Board of Treasury, dated April 16, 1787, signed by Samuel Osgood and Walter Lexington, appointing five commissioners "for stating the accounts" of the several States against the United States for moneys due on account of the Revolutionary war (26672).

*U. S. Indian Office.* From Dr. Z. T. Daniel (Cheyenne River Agency, S. Dak.; Blackfeet Agency, Piegan, Mont.; Keshena, Green Bay Agency, Wis.; Pine Ridge Agency, S. Dak.), through Prof. O. T. Mason: Rattlesnake (26048); stone pipe made by "Petrified," a Piegan Indian woman; primitive skin-scaper of polished elk-horn, also made by a Piegan squaw, and a shell ornament worn by braves of the same tribe (26282); medicine-pouch of a Blackfeet Indian (26349); small leaf-shaped implement found on Wolf River, Wisconsin (26170); 6 brass bracelets obtained from an old burial-mound of the Blackfeet Indians (26750); catlinite napkin-ring and 2 marbles of catlinite made by the Sioux Indians (26797); quilt held by Keokuk in his treaty with Gen. Scott, at Fort Armstrong, Ill., September 21, 1832 (27064); fruit-picker (27124); wooden pipe (27112). From Charles H. Thompson (special agent Indian Service), through Hon. John Noble, Secretary: Ghost-shirt taken from a ghost-dancer, and a gun also obtained from a participant in the Custer massacre (26235).

*U. S. Geological Survey.* Minerals from Colorado, collected by Prof. S. L. Penfield (25891); 150 specimens of Oriskany fossils from Schriver's Hill, Cumberland, Md., collected by C. D. Walcott (25945); specimen of babingtonite from Backland, Mass., collected by B. K. Emerson (25986); 2 specimens of powellite from Seven Devils Mines, western Idaho, collected by Dr. W. H. Melville (26088); photograph of the Monticellite locality at Magnet Cove, Ark., collected by Dr. W. P. Jenney (26146); 39 mounted photographs taken by Prof. I. C. Russell, during his work in the State of Washington under the auspices of the Survey (26204); 3 specimens of diaspore and 1 specimen of corundum in emery, collected in Chester, Mass. (26280); specimen of mixed iron sulphates from near Las Vegas, N. Mex., collected by Dr. W. F. Hillebrand (26435); specimen of flint from the chalk-beds near Austin, Tex., collected by Dr. J. S. Diller (26137); 31 specimens of pilolite from near Silver Cliff, Custer County, Colo., 28 specimens of crystallized alunite and 23 specimens of crystallized diaspore from the Rosita Hills, Custer County, Colo., collected by Whitman Cross (26156); specimen of amesite with diaspore in emery, specimen of diaspore with corundophilite, specimen of margarite, large crystal of ilmenite, from Chester, Mass.; 4 specimens of cerite from Bastnäs, Sweden; 3 specimens of warwickite in calcite from Edenville, Orange County, N. Y., collected by Prof. F. W. Clarke (26490); gold in malachite from Peacock Mine, Seven Devils district, Idaho, collected by Dr. W. H.

- Melville (26584); 17 photographs, (26916); large collection, consisting of 34 specimens of Jurassic invertebrates, representing 4 species, from Wyoming and California, and 5,358 specimens, representing 56 species, of cretaceous invertebrates from the Western States and Territories (27094).
- Through Prof. F. W. Clarke: One specimen, consisting of 54 pebbles, of josephinite (original material), from Josephine and Jackson counties, Oreg. (26016); 9 specimens of minerals from various localities, consisting of xenotime, ulexite, gummite, uraninite altering to gummite, cyrtolite, stalagmite marble, stibiconite, topaz, and fergusonite (26136); monozite from North Carolina (26587).
- Through William H. Dall: Fossil mammalian bones from the Miocene formation of Maryland and Virginia, collected by Frank Burns (26119).
- Through C. D. Walcott: One hundred specimens of Lower Devonian corals from Genesee County, N. Y. (25891).
- INTERNATIONAL BOUNDARY COMMISSION. (See under Smithsonian Institution. U. S. National Museum.)
- INTRAM, ROBERT (Chenoweth, Wash.). Specimen of *gordius*. 26648.
- JACKMAN, J. V. (Marlboro, Mass.). Four specimens of green talc on steatite. 26432.
- JAMES, J. F. (Department of Agriculture). Barnacles and bryozoans from Asbury Park, N. J. 26381.
- JARVIS, J. F. (Washington, D. C.). Four stereoscopic views of the Giant's Causeway, coast of Ireland. 26894.
- JENNEY, Dr. W. P. (See under Interior Department. U. S. Geological Survey.)
- JENNINGS, F. H. (Washington, D. C.). Bottle of Chinese medicine in original package. 26492.
- JOHNS HOPKINS UNIVERSITY (Baltimore, Md.), through Dr. D. C. Gilman, president; cast of the Chaldean Flood Tablet, as reconstructed by Prof. Paul Haupt (gift) 27146.
- JOHNSON, Prof. E. H. (Chester, Pa.). Two albums of American celebrities. Deposit. 26218.
- JOHNSON, H. L. (Louisville, Ky.). Collection of 249 archaeological objects, consisting of leaf shaped implements, perforators, scrapers, worked flakes, arrow and spear-heads, fragments of pottery (26285); collection of rude stone implements, flakes, and chips from an Indian workshop in Stewart County, Tenn. (26392). Exchange.
- JOHNSON, J. H. S. (Kent, Wash.). Specimen of *Papilio zolicaon*. 26158.
- JOHNSON, Judge L. C. (U. S. Geological Survey). Pitted stone found in Prentiss County, Miss. 26253.
- JOHNSON, PAUL J. (Globe, Ariz.). Specimen of *Perezia Wrightii*. 25978.
- JOHNSTON, F. B. (Washington, D. C.). Twenty-six photographs, representing views in and about Mammoth Cave, Ky. Purchased for the World's Columbian Exposition. 26130.
- JOHNSTON, Mrs. WILLIAM PRESTON (New Orleans, La.). Baskets made by the Choctaw Indians of Black Bay, near Bay St. Louis, Miss. (gift) (26362); 14 baskets obtained from the Attapapas Indians of southern Louisiana (exchange) (26698).
- JOHNSTON-LÁVIS, H. J. (Naples, Italy). Marialite from near Naples (gift) (26055); 67 photographs, representing views of south Italian and Icelandic volcanoes (purchased for the World's Columbian Exposition) (26132).
- JONES, J. J. (Department of the Interior). Eight photographs of famous English inventors. Exchange. 26568.
- JONES, J. T. (Washington, D. C.). Specimen of Baltimore oriole, *Icterus galbula*. 26313.
- JONES, Dr. L. C. (Melrose, Mass.). Five birds' skins, representing 4 species, consisting of green heron, *Butorides virescens*; pectoral sandpiper, *Tringa maculata*; red phalaropes, *Crymophilus fulicarius*, common tern, *Sterna hirundo*. 26641.

- JORDAN, DR. D. S. (Palo Alto, Cal.). Two type specimens of *Salmo mykiss aqua-bonita* from California, and type specimens of *Salmo kamloops* from Kauloop Lake, British Columbia (26379); type specimens of *Couesius Greeni* and *Pollachius chalcogrammus* (wall-eyed variety) (26985). (See under U. S. Fish Commission.)
- JOUY, P. L. (U. S. National Museum). Two hundred obsidian flakes or knives from Jalisco, Mexico. 27143. (See under Smithsonian Institution. U. S. National Museum.)
- KALDENBERG COMPANY, F. J. (New York City). Collection of objects illustrating the utilization of pearl, ivory, and horn (purchased for World's Columbian Exposition) (26772 and 26773); pearl-shell cut to illustrate its manufacture into buttons (gift) (26862).
- KALDENBERG, F. R. (New York City). Whale and walrus tusks, with Japanese and Chinese carvings (purchased for World's Columbian Exposition). 26770.
- KAYSER, WILLIAM (Wapakoneta, Ohio). Insects, representing 35 species. 26377.
- KEAM, THOMAS V. (Keams Cañon, Ariz.), through W. J. McGee. Collection of fossil bones, collected by Mr. Keam in Arizona. 27072.
- KEELY, THOMAS (Washington, D. C.). Living bat. 26622.
- KEITH, JOHN (San José, Costa Rica), through Lieut. George P. Scriven, U. S. Army. Collection of beetles, representing 70 species of coleoptera from Central America. 26734.
- KELLER, F. (Philadelphia, Pa.). Arabic mosque lamp and Moorish candlestick. Purchase. 25911.
- KELLOGG, W. A. (Norwalk, Conn.). G. A. R. badge of Buckingham Post No. 12, representing the oyster industry, twenty-sixth National Encampment at Washington. 26229.
- KEMP, Prof. J. F. (Columbia College, New York City). Specimens of eruptive rocks from New Jersey, New York, and Massachusetts. 26378.
- KEMPTON, C. W. (Ore Blanco, Ariz.). Beetle (*Strategus julianus* Burm.). 26287.
- KENYON, F. C. (Lincoln, Nebr.). Seven species of myriopods. 27005.
- KEPPEL, F. & CO. (New York City). Etching by Samuel Coleman (26729); soft-ground etching by "old Crome" (26896). Purchased for World's Columbian Exposition.
- KERR, M. B. (New York City). Specimen of crested grasshopper, *Tropidacris dur*, from Panama. 26583.
- KERR, WALTER C. (New Brighton, N. Y.). Sponge from South Beach, Staten Island. 26949.
- KERSHAW, C. E. (Holmesville, Miss.). Indian bead, found in a field near Holmesville. 25898.
- KEYER, W. D. (Springfield, Mass.). G. A. R. badge of E. K. Wilcox Post No. 16, twenty-sixth National Encampment at Washington. 26231.
- KILBORNE, DR. F. L. See under Department of Agriculture.
- KIMBER, JOSEPH F. (Williamsport, Md.). Two specimens of lunar-moth, *Actias luna*. 26006.
- KIMMEL & VOIGT (New York City). Collection of electrotypes, matrices, and proofs to illustrate the electrotyping and printing of etchings, aquatints, etc. Purchased for the World's Columbian Exposition. 26952.
- KINCAID, TREVOR (Olympia, Wash.). One hundred and twenty-one species of North American insects (mostly coleoptera). 25967.
- KING, DR. G. (See under Calcutta Botanic Garden.)
- KINGSBURY, C. H. (Allen, Ind. T.). Fossil tooth of mastodon, dug out of a bank near Allen. 26107.
- KINNEY, MRS. L. C. (Washington, D. C.). Ten pictures belonging to the "Catlin Collection." Deposit. 27051.
- KIRBY & SMITH (Passaic, N. J.). Pair of Langshan fowls. Presented for World's Columbian Exposition. 26676.

- K. K. HOFMUSEUM (Vienna, Austria), through Dr. A. Brezina, curator. Fifty specimens of minerals from various European localities. Exchange. 26488.
- KLOEBER, CHARLES E. (Washington, D. C.). Quartz crystal from Crystal Mountain near Hot Springs, Ark., and a specimen of manganopectolite from Magnet Cove, Ark. 26575.
- KNIGHT, W. C. (Laramie, Wyo.). Two specimens of rough arrow-points, found on the west shore of Cooper Lake, Albany County (26844); 5 rude chipped implements (27655).
- KOCH, F. W. (Twin Oaks, Cal.). Red rattlesnake. Purchased for World's Columbian Exposition. 26163.
- KOCH, Capt. (See under Dr. D. B. Northrup.)
- KOEHLER, S. R. (U. S. National Museum). Forty-eight prints (lent for exhibition at World's Columbian Exposition) (26721) (returned); 21 specimens illustrating the etching processes (lent for World's Columbian Exposition) (26926); 3 specimens illustrating methods of color-printing (27070).
- KOHL, HENRY (Boston, Mass.). Photochromo-lithograph "Japanese Girl," after R. Blum, proof. Lent for World's Columbian Exposition. 26719. (Returned.)
- KRANTZ, Dr. (Bonn, Prussia), through F. W. Crosby. Basaltic column. Purchased for World's Columbian Exposition. 26921.
- KUEHLING, J. H. (Washington, D. C.). Two specimens of hog-nose snake (25974); 2 snakes from Mount Vernon, Va. (26279); 2 flying-squirrels, in flesh (26384); snake (*Diadophis punctatus*) (26691).
- KULLE, ALBERT (Washington, D. C.). Two turtles. 27032.
- KUNZ, GEORGE F. (New York City). Fifty brass eikons, 2 priests' robes, altar-covers, 2 silver ceremonial objects, gilded jar, glass jeweled crown, 6 wooden eikons, and embroidered insignia of an altar-boy (purchase) (25900); 2 etchings of meteoric iron from Glorieta Mountain, Santa Fé County, N. Mex., showing widmanstätten figures, one printed-direct and the other from a copper electrotype (gift) (26143); 4 samples of platinum and platinum gravels from the Demidoff estate, Perm, Ural Mountains, European Russia (gift) (26617). (See under Smithsonian Institution. Bureau of Ethnology; and J. L. Story).
- LACOE, R. D. (Pittston, Pa.). Paleozoic plants (26102, 26965 \*).
- LAMB, T. F. (Portland, Me.). Photograph of a tourmaline crystal in quartz from Auburn. 26147.
- LAMBORN, Dr. R. H. (Washington, D. C.). One-dollar gold coin, 27 G (A. Bechtler, Carolina gold); one-dollar gold coin, 30 G (C. Bechtler, Carolina gold); five-dollar gold coin, 128 G (C. Bechtler, Georgia gold). Deposit for World's Columbian Exposition. 26935.
- LAMPARD, HENRY (Montreal, Canada). Rocks from near Montreal, and 8 specimens of calcite from the same locality. 26363.
- LANDER, W. TERTSH (Williamston, S. C.). Specimen of tuckahoe, or Indian bread. 26589.
- LANE, MERT (Waynesville, Mo.). Spider (*Argiope riparia*), with egg-cocoon (26308); specimen of *Lycosa* sp. (26158).
- LANGDALE, J. W. (Washington, D. C.). Native sulphate of iron (gift) (26383); stalaetic calcite and aragonite from Weyer's Cave, Virginia (exchange) (26733); concretions from Lamond Station, Metropolitan Branch, Baltimore and Ohio Railroad (gift) (27116).
- LANGSHAW, J. P. (Lawrence, Mass.). Two cocoons of cecropia-moth, and 9 cocoons of promethea-moth. 26825.
- LANSINGER, W. H. (Littletown, Pa.). Royal walnut-moth, *Citheronia regalis*. 26005.

\* These two sendings form the second and third installments of a large collection of selected paleozoic plants presented by Mr. Lacoe.

- LANO, ALBERT (Madison, Minn.). Nineteen specimens, representing 12 species of birds' skins, from Minnesota and Oregon. Exchange. 26554.
- LANTHIER, L. A. (New York City). French harp. Purchase. 26533.
- LARNER, JOHN Q. (U. S. Bureau of Engraving and Printing, Washington). Coot (*Fulica americana*). 26389.
- LARTIGUE, DR. G. B. (Blackville, S. C.). Arrow-head of quartz crystal. 25984.
- LASSIMONNE, S. E. à Yseure (Allier), France. Dried plants from the interior of France. Exchange. 26208.
- LATTIN & CO. (Albion, N. Y.), through Capt. C. E. Bendire, U. S. Army. Two specimens (male and female) of Magathan yellow-throat, *Geothlypis poliocephala* from Brownsville, Tex. 27011.
- LATTIN, LOUNT (Staatsburg, N. Y.). Pair of black Java fowls. Gift for World's Columbian Exposition. 26667.
- LATTINE, GEORGE W. (Newburyport, Mass.). G. A. R. badge, Department of Massachusetts. 26230.
- LEE, THOMAS (care of U. S. Fish Commission). Ethnological objects obtained from graves and through other sources in southeastern Alaska. 27106.
- LEIGHTON, J. F. (See under Ozark Onyx Company.)
- LEMBERT, J. B. (Yosemite, Cal.), through L. O. Howard. Two specimens of *Colias behrii*. 26051.
- LENTZ, W. M. S. (Allentown, Pa.). Blue-tailed turbit pigeon. 26477.
- LESSER & SAWYER (Winslow, Ariz.). Typical specimen of Cañon Diablo meteorite. 27105.
- LEVY, L. E. (Philadelphia, Pa.). Pamphlet entitled "A new Photo-Intaglio Process" by Mr. Levy. 26612.
- LEVY, R. J., Tarakdjilar Han, Stamboul, Constantinople. Illuminated Koran. Deposit. 26953.
- LEWIS, C. A. (Wickford, R. I.). Lumpfish (*Cyclopterus lumpus*). 27035.
- LIGHTFOOT, JEROME (Terrace Heights, Washington, D. C.), through Dr. Leonhard Stejneger. Two specimens of Helgrammites (larvæ of *Corydalis cornutus*). 26225.
- LINCOLN, J. M. (New York City). Fossil teeth of *Oxyrhina hastata* and *Carcharodon megalodon*. 26594.
- LITTLE, DR. J. W. (Washington, D. C.), through Prof. O. T. Mason. Spider (*Epeira insularis* Hentz). 26364.
- LITTLEJOHN, CHASE (Redwood City, Cal.). Egg of Nelson's ptarmigan from Unalaska Island, Alaska. New to the collection. 26352.
- LOGAN, Mrs. W. P. (See under Caroline M. Northam.)
- LOOMIS, REV. HENRY (Yokohama, Japan). Crustaceans, echinoderms, hydroids, and shells from Japan. 26708.
- LÖNNBERG, DR. E. (Orlando, Fla.). Alcoholic specimens of *Etheostoma quiescens* Jordan and *Elassoma evergladei*. 26678.
- LOVETT, EDWARD (Croydon, England). Stone implements, flints, human leg and arm-bones, fragments of crania from England, Ireland, Germany, and Belgium; also ethnological objects and a photograph. Exchange. 27077.
- LOWDERMILK, W. H. & CO. (Washington, D. C.). Five Japanese scroll pictures, illustrating Aino life. Purchase. 25889.
- LYALL, J. (See under Fridolf Håk.)
- LYON, Mrs. ELIZA (Williamsport, Pa.). Two large globes and stands, formerly the property of Dr. Priestley. 27050.
- LYON, Mrs. Dr. THOMAS (Williamsport, Pa.). Piece of electrical apparatus belonging to Dr. Priestley. 26974.
- LYONS, Prof. A. B. (Honolulu, Hawaiian Islands). Volcanic materials (26356, 26611). Purchased for World's Columbian Exposition.
- McASTRO, H. T. (See under Mrs. B. F. Poston.)
- McCONNELL, ALBERT E. (Washington, D. C.). Snakes from Virginia. 26782.



- McCORMICK, L. M. (Smithsonian Institution). Specimens of *Necturus maculatus* from Lake Erie (26709); mounted specimens of Mexican crossbill, *Loxia curvirostris Stricklandi*, from Omaha, Nebr., (26878). Exchange. (See under C. A. Whitney.)
- McDONALD, A. F. (Wind Cave, S. Dak.). Stalactitic and stalagmitic material. Purchased for World's Columbian Exposition. 26969.
- McDONALD, Col. MARSHALL. (See under U. S. Fish Commission.)
- McFARLAND, R. (Cumberland House, Hudson's Bay Company, Canada). Two albino minks (*Putorius vison*). 26380.
- MCGEE, W. J. (See under Thomas V. Kearn.)
- McGUIRE, J. D. (Ellicott City, Md.). Apparatus for the manufacture of stone implements. 26504.
- McLHENNY, E. A. (Avery, La.). Set of eggs of bobolink from southern Louisiana. (This gift is exceedingly interesting on account of the locality, extending the breeding range of this species much farther south than had been previously known.) 26683.
- McMURLY, Mrs. HELEN (Oneonta, N. Y.), through Rev. J. Owen Dorsey. Specimen of *Proteus* from Germany. Deposit. 25885.
- MACFARLAND, Miss ALICE (U. S. National Museum). House-sparrow (*Passer domesticus*), in the flesh. 26318.
- MAGER, Miss ERNESTINE (St. Boniface, Manitoba, Canada), through Dr. Cyrus Thomas. Temperance medal. 26160.
- MANN, Rev. ALBERT (Newark, N. J.). Microscopic slides of diatoms. 26516.
- MANN, Miss E. (Washington, D. C.). Collection of portraits of eminent men. 26595.
- MAPEL, H. B. (Columbus Grove, Ohio). Small leaf-shaped implements found *en cache* near Columbus Grove. 26765.
- MARION PHOSPHATE COMPANY (Dunnellon, Fla.). Io-moth (*Hyperchiria io*). 26083.
- MARSH, C. D. (through C. T. Simpson, U. S. National Museum). Slides of fresh-water crustaceans from Wisconsin. 27088.
- MARSH, CHARLES H. (Dulzura, Cal.). Specimen of Western bat, *Vesperugo hesperus*, specimens of dusky-footed woodrats, *Neotoma fuscipes*, and 2 bats (25941, 26335) (purchased for World's Columbian Exposition), specimen of brown bat, *Vespertilio (?) nitidus*, specimen of *Adelonycteris fuscus*, and skin of bat (25942, 25 43, 26117) (purchase).
- MARSHALL, GEORGE (Smithsonian Institution). Two specimens of *Sciurus hudsonius* (25932); 2 specimens of hoary bat, *Atalapha cinerea*, and a specimen of shrew (*Blarina brevicauda*) from Laurel, Maryland (26336); 2 specimens of shrew (26397); specimen of pine-mouse, *Arvicola pinctorum* (26444); shrew (*Sorex* sp.), and red squirrel, *Sciurus hudsonius* (26517).
- MARSHALL, HENRY (Washington, D. C.). Birds' skins, representing 4 species from Laurel, Maryland (25944); American goldfinch, *Spinus tristis* (25961).
- MARX, Dr. GEORGE (Department of Agriculture). Gossamer spider-web from Florida. 26769.
- MASON, H. D. & SONS (Fabius, N. Y.). Golden Wyandotte fowl and hen (26846, 26980).
- MASON, J. T. (Jalapa, Mexico), through Prof. C. V. Riley. Two hundred and eighty-eight specimens of coleoptera, 3 specimens of hemiptera, and 5 specimens of orthoptera. 26948.
- MASON, J. WOOD. (See under Indian Museum.)
- MASON, Prof. O. T. (U. S. National Museum). Specimen of emperor-moth *Eacles imperialis*, from Mount Vernon, Va. (25970); robber wasp, *Sphecius speciosus*, and specimen of dog-day cicada, *Cicada tibicen* (26067). (See under Dr. Z. T. Daniel, Dr. J. W. Little.)
- MATTHEWS, W. (Fort Wingate, N. Mex.). Salamander (*Amblystoma tigrinum*). 26009.

- MAXWELL, J. A. (Fulda, Minn.). Fragment of pottery found on the shore of the lake. 27060.
- MEAD, C. H. (Sayreville, N. J.). Small collection of fossils from the Potomac formation (26047); fossil plants (26075, 26118, 26192, 26311). Exchange.
- MEARNS, Dr. EDGAR A., U. S. A. (International Boundary Commission). The following collections have been obtained by Dr. Mearns for the Museum, while engaged with the International Boundary Commission: Collection of mammal skins, skulls, rocks; 48 specimens, representing 38 species, of birds' skins from the Mexican boundary (26022); 168 specimens, representing 53 species of birds from New Mexico, 7 specimens of miscellaneous insects and myriapods, 4 eggs of scaled partridge, 8 eggs of white-necked raven, nest and fragments of eggs of the hepatic tanager, and a nest of the western wood pewee; also nest of Arkansas flycatcher from near the boundary line between Mexico and the United States, alcoholic specimens of fishes, reptiles, mollusks, mammal skins, skulls, bones, and horns (26371); through F. X. Holzner, fragments of pottery and other objects of a similar character found near cave-dwellings in the vicinity of Camel Mountain, near El Paso, collected by Dr. Mearns and Mr. Holzner; fragments of pottery, collection of birds' skins, fossil shells, ores and rocks, plants, shells, birds' eggs, all collected as above stated (26499); stone implement "sinew comb" from Mexican boundary line south of Bisbee, Ariz., 8 alcoholic specimens of insects, 261 specimens, representing 105 species of birds' skins, fishes, fossil shells, fossil wood, alcoholic reptiles, rocks, shells, mammal skins, all obtained from the boundary line between Mexico and the United States and collected by Dr. Mearns and Mr. Holzner (26608); 18 specimens, representing 12 species, of birds' skins from Fort Worth, alcoholic specimens of fishes and reptiles, and collection of mammal skins and skulls (26689).
- MEDER, F. (New York City). Eleven prints (26728); soft-ground etching, "The Passing Storm," by C. A. Vanderhoof (26838). Purchased for World's Columbian Exposition.
- MELSON, HENRY (Crisfield, Md.). Piece of board from a house occupied by Rev. Joshua Thomas at the time he preached to the British soldiers on Tangier Island in 1814. 26724.
- MELlichamp, Dr. J. H. (Bluffton, S. C.), through Prof. C. V. Riley. Tubes made by crustaceans, from May River, South Carolina. 25897.
- MELVILLE, Dr. W. H. (See under Interior Department, U. S. Geological Survey, and William Tate Taylor.)
- MENGEL, LEVI W. (Reading, Pa.). Set of eggs of king eider, *Somateria spectabilis*, from North Greenland; 2 sets of eggs of night hawk, *Chordeiles virginianus*; set of eggs of sharp-shinned hawk, *Accipiter velox*, from Berks County, Pa. Exchange. 26687.
- MERCK & Co (New York City), through Dr. D. W. Prentiss. Four-gramme specimen of pure Pilocarpine, Merck. 27019. (See under Dr. D. W. Prentiss.)
- MERRHAM, Dr. C. HART (Department of Agriculture). Cap worn by a squaw belonging to the Montagnais tribe of Indians, and iron tomakawk-blade found in the grave of an Indian belonging to the same tribe. 26411. (See under Department of Agriculture.)
- MERRILL, GEORGE P. (U. S. National Museum). Fence-lizard, *Sceloporus undulatus*, and worm-snake *Carpophiops Helena*, from Wyandotte, Ind. (26176); onyx marbles and rocks from Lower California, below San Quentin, and a sample of fire-clay from Elsinor, Cal.; tree-frog, *Hyla regilla* and 8 specimens of miscellaneous insects from the same locality (26319); specimens of cave-salamander, *Speleerpes maculicaudus*, from Little Wyandott Cave, Ind. (26423).<sup>\*</sup> (See under Prof. W. O. Crosby, W. H. Evans & Son, H. C. Ganter, Sal Mountain Asbestos Company, Smithsonian Institution, U. S. National Museum.)

<sup>\*</sup> This species, only recently described, is yet quite rare.

- MERRILL, H. C. (Anburn, Me.). Glacial views. Exchange. For World's Columbian Exposition. 26487.
- MERRILL, Dr. JAMES C., U. S. A. (Surgeon-General's office). Wing of soia rail, *Porzana carolina*, from Fort Canby, Wash. 26666.
- MERRILL, L. H. (Agricultural Experiment Station, Orono, Me.). Negatives of glacial views (deposit), and photographs representing the same objects (exchange). 26387.
- MERRILL, Hon. S. (See under Calcutta Botanic Garden.)
- MERTZ, FRANK C. (Weissport, Pa.). Arrow-heads from Carbon County. 26696.
- MESSIKOMMER, H. (Zurich, Switzerland). Bronze helmet from Greece. 26428.
- MEYER, ABRAHAM (Logan House, Pa.). Views of "Signal stations" in use during the war of 1861-1865. 26778.
- MICHEL BROTHEIS (Berlin, Germany). Casts of Greek and Roman antiquities. Purchased of World's Columbian Exposition. 26651.
- MIDDLETON, Prof. J. HENRY (Director, Fitzwilliam Museum, Cambridge, England). Photographs of a Phœnician altar. 26164.
- MILLER, CHARLES, Jr. (Grand Rapids, Mich.). Travertine (26791); jasperized wood from Woodruff, Ariz. (27025).
- MILLER, H. D. (Plainville, Conn.). Archaeological objects, consisting of rude chipped implements, worked flint flakes, scrapers, perforators, arrow and spear-heads, and fragments of potstone vessels. 26043.
- MILLER, THOMAS (Heron Lake, Minn.). Twenty-one sets of eggs of Franklin's gull (58 specimens). 27095.
- MILLER, W. (Grand Rapids, Mich.). Iron ring, coin, button, sleigh-bell, and some hand-forged nails found on the camping-ground opposite Queenstown Heights, where the Americans were encamped prior to the battle of 1814. 26810.
- MILES, H. E. (Racine, Wis.). Photograph of a basket-carrying frame used by the Mojave Indians of Arizona. 26572.
- MILLS, S. B. (Lockport, N. Y.). Large arrow-head from Orleans County. 26751.
- MINER, S. O. (Brattleboro, Vt.), through Robert Ridgway. Pair of silver-spangled Hamburg fowls (26565); feathers of silver-spangled Hamburg fowl (26668).
- MINOT, JAMES (Concord, N. H.). Badge of G. A. R., Department of New Hampshire. 26248.
- MITCHELL, J. D. (Victoria, Tex.). Unionida from Texas (26081); shells and marine invertebrates (26114); through W. H. Dall, 2 dry specimens of crabs (*Sesarma cinerea* and *Petrolisthes armatus*) (26414); shells and other similar specimens (26959).
- MOHRMAN, J. H. (Talmage, Nebr.). Chrysalis of morning-cloak butterfly, *Vanessa antiopa*. 26224.
- MONCKTON, Sir JOHN B. (See under Smithsonian Institution.)
- MONTANDON, Prof. A. L. (Bucharest, Roumania), through Prof. C. V. Riley. Alcoholic specimen of bat, land shells, 26 specimens of reptiles and batrachians, including a fine series of *Molge Montandoni*, a salamander recently described and named in honor of the donor, collection of insects consisting of 2,200 specimens of heteroptera, 110 specimens of homoptera, and 22 specimens of European coleoptera. 25994.
- MONTANÉ, Dr. LUIS (Havana, Cuba), through W. Hallett Phillips. Photographs of stone implements and carvings, fragments of pottery and human skulls, and 12 plates, the originals of which were collected by Dr. Montané near Cape Maisi, Island of Cuba. 26934.
- MONTGOMERY, Prof. HENRY (Salt Lake City, Utah). Photographs representing views in Utah. 26927.
- MOONEY, JAMES. (See under Smithsonian Institution. Bureau of Ethnology; and Rev. H. N. Voth.)
- MOORE, CLARENCE B. (Philadelphia, Pa.). Archaeological objects, consisting of

- fragments of human and other bones found in excavating a shell-heap on Hitchen's Creek, Florida, fragments of pottery from shell-deposits in Volusia and Lake counties, and pieces of painted pottery from a sand burial-mound near Volusia. 26520.
- MOORE, H. C. (Cape Town, South Africa), through George F. Hollis, U. S. consul at Cape Town. Valuable collection of skins, skulls, and horns of antelopes and other large mammals, collected by the donor in South and South Central Africa. 26704.
- MOORE, Prof. JOSEPH (Earlham College, Richmond, Ind.). Photographs of bones of *Castoroides ohioensis*. 26420.
- MOORE, W. S. (U. S. Navy). Sea lily. 26767.
- MORAIS, Rev. Dr. S. (Philadelphia, Pa.). Silver habdalah set. Lent for World's Columbian Exposition. 26815.
- MORAN, PETER (Philadelphia, Pa.). Plates, tracing, and three proofs to illustrate the etching process. Purchased for World's Columbian Exposition. 26837.
- MORELAND, WALTER (Washington, D. C.). Specimens of silver gar, *Tylosurus caribbaeus*, from Chesapeake Bay, with parasitic crustaceans found in its mouth. 26007.
- MORGAN, Dr. EDWIN L. (Washington, D. C.). Large partlesch, obtained from the Colispel Indians. 26808.
- MORO, Sir ANTONIO. (See under C. F. Gunther.)
- MORRIS, Mrs. MARY B. (See under National Society of the Daughters of the American Revolution.)
- MORRIS, WILLIAM (Tucson, Ariz.). Specimen of Masena quail or partridge (*Cyrtonyx montezuma*). 26440.
- MOSBY, Lieut. J. S. (See under William B. Cary.)
- MOSIER, CYRUS A. (Seattle, Wash.). Head, wing, and tail of Clarke's crow or nut-cracker (*Picicorvus columbianus*). 26369.
- MOSS, WILLIAM (Ashton-under-Lyne, England). Photographs showing anatomy of mollusks. 26753.
- MUNGEN, THEODORE (Washington, D. C.). Snake. 27029
- MUNICH ACADEMY (Munich, Bavaria), through Prof. P. Groth. Rocks and minerals. Exchange. 26276.
- MUNSON, M. S. (Velasco, Tex.). Gorgouians found on the Gulf coast near Velasco. 26645.
- MUSEUM OF FINE ARTS (Boston, Mass.). Lithographs, "Portrait of a Lady," by Kriehuber, and "Feeding the Birdies," by Lasalle after Breton. Lent for World's Columbian Exposition. 26720. Returned.
- NATIONAL MUSEUM OF COSTA RICA (San José, Costa Rica), through George K. Cherrie. Type specimen of a supposed new species of *Zeledonia* (*Zeledonia insperata* Cherrie), from the Volcan de Irazú, Costa Rica (26087); type specimen of *Cypseloides Cherriei*, a new species from the same locality (26262).
- NATIONAL SOCIETY OF THE DAUGHTERS OF THE AMERICAN REVOLUTION (Washington, D. C.), through Mrs. Devereux and Mrs. Bulloch. Chinaware decorated in red and gold belonging to Mrs. Mary Bartelemy Morris, wife of Captain Daniel Morris of the Revolutionary war. Deposit. 26993.
- NEOGRAPH PUBLISHING COMPANY (Boston, Mass.). Collograph. "The Butgomaster." 26737.
- NEUMOEGEN, B. (New York City). Specimens of *Nyctemerida*. 26860.
- NEVILLE, W. R. (Houston, Tex.). Hermit-crab and shell. 26561.
- NEWBALL, W. H. (See under The Grotto Company.)
- NEWLON, Dr. W. S. (Oswego, Kans.). Malachite in a partially decomposed granite, from the Chickasaw Nation, and favosites from the same locality. 25917. Returned.
- NEWMAN & SON (Washington, D. C.). Three caligraphs. 26113.

- NEWTON, Prof. H. A. (Yale University, New Haven, Conn.). Meteoric stone from Winnebago County, Iowa. Purchased for the World's Columbian Exposition. 26920.
- NEWTON, WILLIAM (Salt Lake City, Utah). Block tin from the Newton American tin mines in Utah, and a lithographic stone from the Newton American lithographic stone quarry. 27109.
- NEW YORK COIN AND STAMP COMPANY (New York City). One hundred and sixty-two medals commemorating events in the early history of the colonies and the United States (purchased for World's Columbian Exposition) (25954); 9 gold and silver coins of the United States (purchase) (26366).
- NOAH, JOHN M. (U. S. National Museum). Bremen silver coin (one grote), dated 1749. 26368. (See under Pelham and Lloyd.)
- NOBLE, Hon. JOHN W. (See under Interior Department. Indian Office, Charles H. Thompson.)
- NORTHAM, CAROLINE M. (Philadelphia, Pa.), through Mrs. W. P. Logan. Pair of earrings made from the Charter-oak of Hartford, Conn. 26743.
- NORTHRUP, Dr. D. B. (San Diego, Cal.). Silk-moth secured by Capt. Koch from Cedros Island, Mexico. 26580.
- NUTTALL, G. H. F. (Johns Hopkins Hospital, Baltimore, Md.). Birds' skins and mounted birds from California and Mexico. 26877.
- NUTTALL, Mrs. ZELIA (Florence, Italy). Models of the yoke and pails used by Venetian water-carriers. 26984.
- NYE, WILLARD, JR. (New Bedford, Mass.). Shells, flint flake, and fragments of pottery from the surface of a mound on the Government reservation at Tampa, Fla. 26891.
- OBER, F. A. (Washington, D. C.). Carb stone implements (26798); collection of Spanish-American gold, silver, and copper coins (26799). Purchased for World's Columbian Exposition.
- OPPENHEIMER, S., & Co. (New York City). Intestinal products and articles manufactured therefrom. 26774.
- ORTH, GEORGE S. (Pittsburg, Pa.). Birds' skins from Colorado. Exchange. 26661.
- OSBORNE, J. W. (Washington, D. C.). Electrotypes made by Jewett & Chandler's wax process, plate ready for electrotyping by Mauch's process, electrotype made by Mauch's process (26548); lithograph, "Christ among the Doctors," by Adolf Menzel (26606).
- OWEN, H. S. (Washington, D. C.). Rear-driving safety bicycle, and a woman's bicycle. Deposit. 27018.
- OWENS, Prof. J. G. (See under Peabody Museum.)
- OWSLEY, Mrs. W. T. (Glasgow, Ky.), through Dr. W. T. Owsley. Humming-bird, in the flesh. 25948.
- OWSLEY, Dr. W. T. (Glasgow, Ky.). Rattlesnake captured near Mammoth Cave, Ky., by Andrew Hawkins of Glasgow Junction. 26071. (See under Mrs. W. T. Owsley.)
- OZARK ONYX COMPANY (St. Louis, Mo.), through J. F. Leighton, president. Slab of stalagmite. Purchased for World's Columbian Exposition. 26888.
- PALMER, Dr. EDWARD (Washington, D. C.). Collection of ethnological objects obtained from the Coahuillos Indians, Lower California, and also from other tribes (26324); specimens of crustaceans from Byron Hot Springs, Cal., and geological material (26372); sample of paper made from *Yucca filamentosa* and straw, from Golden, Colo. (26426). (See under Department of Agriculture.)
- PALMER, JOSEPH (U. S. National Museum). Mink (*Putorius vison*) (26072); Miocene fossils from Papaw Hollow, near Leonardtown, Md., on St. Clement Bay (26103); raccoon (*Procyon lotor*), from Henrico County, Va., and 2 flying-squirrels, *Sciuropterus volucella* (26326); chipmunk (*Tamias striatus*), from Virginia (26329); ermine (*Putorius erminea*), from Arlington, Va. (26331).

- PALMER, WILLIAM (U. S. National Museum). Specimen of red bat, *Atalapha noveboracensis* (26330); red squirrel, *Sciurus hudsonius*, from Mount Vernon, Va. (26337); 3 skins of hooded-warbler, *Sylvania mitrata*, from Hanover County, Va. (26133); meadow-mouse, *Arvicola riparius*, and house-mouse, *Mus musculus* (26541); bird and snakes (26911); 2 specimens of flying-squirrel, *Sciuropterus* (26923). (See under Smithsonian Institution, U. S. National Museum, and National Zoological Park.)
- PARK, J. T. (Warner, Tenn.). Six specimens of purple and bronzed grackle, *Quiscalus quiscula* and *Quiscalus aeneus*, and hybrids from Tennessee. 26115.
- PARRY, MAGGIE (Carbondale, Pa.). White spider (*Misumena vatia* Clark) belonging to the family Thomisidae. 25890.
- PATTEE, F. B. (Valley Springs, Cal.). Set of eggs of killdeer (*Egialitis vocifera*). 26151.
- PATTEE, ORSON (Jarbaló, Kans.). Leech. 27075.
- PATTON, WILLIAM H. (Hartford, Conn.). Wasp (*Astata montana*) representing a species new to the collection, obtained by Prof. A. Dugès, of Mexico. 27037.
- PAVLOW, Prof. A. (Moscow University, Moscow, Russia). Fossils. Exchange. 26069.
- PAYN, ELIAS J. (Tres Piedras, N. Mex.). Bituminous coal from New Mexico. 26468.
- PEABODY MUSEUM (Cambridge, Mass.), through Prof. J. G. Owens. Two stuffed lizards, 4 specimens of birds, 10 nests of *Gymnostinops Montezumæ*, collected by Mr. J. G. Owens while connected with the Peabody Museum Honduras expedition. 26025.
- PEALE, DR. A. C. (U. S. Geological Survey). Photographs of oil portraits of Charles Wilson Peale, Titian Ramsay Peale, Chief Justice Edward Shippen, James Peale, Raphael Peale, and Dr. William Stoughton. 26871.
- PEARSON, C. F. (Portland, Oreg.). Samples of wax (?) and specimens of coal from Nehalem River, Tillamook County, Oreg. 26673.
- PECHM, E. C. (See under The Grotto Company.)
- PELHAM & LLOYD (Washington, D. C.), through John M. Noah. Soapstone from Fairfax County, Va. 26033.
- PELTON, C. A. (Middletown, Conn.). Photograph of gravestone of Dr. Joseph Barratt, botanist. 26842.
- PENFIELD, Prof. S. L. (Yale College, New Haven, Conn.). Minerals from Branchville, Conn. 26040. (See under Interior Department. U. S. Geological Survey.)
- PERRY, HARRY W. (New Orleans, La.). Alcoholic reptiles, mammals, and bats; fishes consisting of *Batrachoides*, *Querimana*, *Heros*, *Citharichthys*, *Tetradon*, *Rhypticus*, *Symbranchus*, *Carcharhinus*, and saw of *Pristis pectinatus*; beetles, spiders, and crested grasshopper, crabs, specimen of *Orthalicus zebra* (26975); skull of pelican, mammal skins and skulls, hammock made of bark, and bottle of hair-oil made from palm; stone implement, alcoholic insects, rostrum of sawfish (*Pristis pectinatus*), and dried gorgonian from Honduras (27078).
- PERRY, R. S. (Piedmont, Ala.). Beauxite. 26735.
- PERRY, W. G. (See under Post-Office Department.)
- PESOA, Miss (Philadelphia, Pa.). Embroidered cloth (Spanish) used at the ceremony of circumcision. Deposited for World's Columbian Exposition. 26429. Returned.
- PETERS, Mrs. S. D. (Washington, D. C.). Common marmot (*Hapale jacchus*) (26417). 26630.
- PETTIGREW, J. A. (Chicago, Ill.). Skin of manatee (*Trichechus latirostris*) from Florida. Purchased for World's Columbian Exposition. 26442.
- PHILLIPS, W. HALLETT (Washington, D. C.). Aboriginal pipes (one from North Carolina and the other obtained from the Blackfeet Indians, Idaho) (lent for World's Columbian Exposition) (26680); alcoholic reptiles and insects from Nicaragua and this country (26695). (See under Dr. Luis Montané.)

- PICHER, Miss ANNIE B. (Pasadena, Cal.). Fourteen photographs illustrating Indian life in California. 26627. (See under The Pasadena Loan Association.)
- PILLING, JAMES C. (U. S. Bureau of Ethnology). Photograph of the interior of a Maori Wharf Rumanaga, or Council Chamber, at Te Ore Ore, Wairarapa, New Zealand. 26955.
- PILSBRY, H. A. (Academy of Natural Sciences, Philadelphia, Pa.). Land and fresh-water shells, representing 7 species, from Florida and the Catskill Mountains. 26070.
- POLLOCK, GEORGE F. (Washington, D. C.). English bloodhound. 26915.
- POND, Lieut. CHARLES F. (U. S. Navy). Skin of lizard. 25895.
- POPE, H. (Quebec, Canada). Skins and bones of gray seals, from the Island of Anticosti. 26021.
- POST-OFFICE DEPARTMENT:
- WANAMAKER, Hon. JOHN (Postmaster-General). Persian lantern. Purchase. (25930).
- Dead-Letter Office*, through W. G. Perry, chief clerk: Millepeds found in the mail. (27083).
- POSTON, Mrs. B. F. (Washington, D. C.). Piece of biscuit baked in camp by H. T. McAstro, a Confederate soldier. 26199.
- POTTER, Rev. J. A., U. S. Army (Fort Clark, Tex.). Lizards and insects. 27138.
- POWELL, CHARLES P. (Baltimore, Md.). Yellow turbit pigeon. 26405.
- POWELL, Maj. J. W. (Director, U. S. Geological Survey). Photographs of a jade card-receiver with ebony base. 25985. (See under Interior Department. U. S. Geological Survey, and Smithsonian Institution. Bureau of Ethnology.)
- POWELL, S. L. (John Hopkins University, Baltimore, Md.). Volcanic rocks from South Mountain, Pennsylvania. Exchange. 27091.
- PRAETORIUS, CHARLES (London, England). Facsimiles in water-color of original drawings made by John White for Sir Walter Raleigh, and now in the Granville collection in the British Museum. Purchased for World's Columbian Exposition. 26851.
- PRANG, L. & Co. (Roxbury, Mass.). Three chromolithographs and one photochromolithograph. 26715.
- PREBLE, E. A. (Department of Agriculture). Three reptiles (27059); short-tailed shrew, *Blarina brevicauda* (27145).
- PRENTISS, Dr. D. W. Alkaloids and salts made from *Pilocarpine pinnatifolus*, manufactured by Merck & Co. 27022. (See under Merck & Co.).
- PRIESTLEY, Dr. (See under Mrs. E. Lyon and Mrs. Dr. Thomas Lyon.)
- PUTNAM, J. HENRY (Abbeville, La.). Hydrocarbon closely related to asphalts. 27053.
- QUANTANCE, A. L. (Lake City, Fla.). Whip-scorpion, *Thelyphonus giganteus*. 26675.
- RABBITT, SAMUEL E. (Washington, D. C.). Red pouter-pigeon. 26409.
- RALPH, Dr. WILLIAM L. (Utica, N. Y.). An exceedingly valuable collection of birds' eggs and nests, consisting of 1604 specimens (420 sets), representing 161 species and subspecies; also 37 nests, several of which are new to the collection (27026); 9 specimens, representing 5 species of birds' skins, and 1 mounted bird from Florida (27056).
- RAMBO, M. ELMER (Lower Providence, Pa.). Fungus (*Polyporus sulphureus*, Bull.) 26742.
- RAMSAY, ALLAN (Constantinople, Turkey). Collection of objects used in the Armenian church, consisting of staffs, musical instruments, and crosses. Purchased for World's Columbian Exposition. 26945.
- RAMSAY, Dr. E. P. (See under Australian Museum.)
- RANDALL, Mrs. BELINDA L. (Boston, Mass.). Hydrogen lamp. 26452.
- RANDOLPH, Miss CORNELIA (Washington, D. C.). Ring of gold wrought by the Ashantee negroes of Africa with their teeth. 25968.

- RANDOLPH, Hon. G. W. (See under William B. Cary.)
- RANSELL, HARRY (Washington, D. C.). Four living specimens of *Argiope riparia* Hentz. 26184.
- RATHBUN, RICHARD. (See under U. S. Fish Commission.)
- RAWDON, F. W. (See under Central New York Naval Veteran Association.)
- RAWOLLE, Miss BERTHA. (See under Dr. T. E. Wilcox, U. S. Army.)
- RAY, G. D. (Burnsville, N. C.). Quartz containing garnet of the almandine variety, from Ray's Mica mine. 25959.
- RAYNOR, N. (Hampston, Va.). Congo-snake, *Amphiuma means*. 26393.
- RENAUD, P. M. (See under S. P. Avery.)
- REYNOLDS, O. L. & O. A. (Covington, Ky.). G. A. R. badge of department of Kentucky. 26232.
- RHOADES, S. N. (Haddenfield, N. J.), through Allen Ruppert. Skeleton of a male Rocky Mountain goat. 26744.
- RICE, Mrs. M. E. (Coryville, Pa.). Arrow-head, perforator, broken arrow-head, chip or flake of chalcedony, rude point, fragment of a drilled stone object, possibly part of a bead (25914); specimens of hawk-moth, *Deilephila lineata*, and 12 archaeological objects consisting of arrow-heads and flint flakes from Clinton and McKean counties (26182); specimen of hawk-moth, *Protoparce celeus* (26412).
- RICHARDS, T. W. (Washington, D. C.). Sets of eggs of fish-crow, American oyster-catcher, and prairie-warbler. 26321.
- RICHARDSON, CLIFFORD (Washington, D. C.). Asphalt from La Brea, Island of Trinidad, British West Indies. 25923.
- RICHMOND, A. G. (Canajoharie, N. Y.). Feather necklace. 26958.
- RICHMOND, C. W. (Washington, D. C.). Alcoholic reptiles, 144 specimens representing 45 species, 3 specimens of *Panopeus serratus* Saussure, *Curdisonia*, sp. and *Palamon* sp., 139 specimens of birds' skins, 5 specimens of fishes (purchase) (26252); volcanic rocks, breastbones of wood ibis and oriole, and an alcoholic specimen of *Synallaxis* (gift) (26460); 2 birds' skins from Nicaragua, representing types of *Trogon chrysomelas* and *Malucoptila fuliginosa* (26496); 3 breastbones (gift) (26711); collection of birds' eggs and nests, consisting of 50 specimens and 16 nests (purchase) (26626); 2 skins of *Cebus hypoleucus*, with skulls, 49 specimens, representing 30 species, of reptiles and batrachians in alcohol, mollusks, representing 30 species, alcoholic specimens of marine invertebrates, insects, 114 specimens of birds' skins, egg of Giraud's flycatcher, *Myzetes texensis*, 24 alcoholic specimens of fishes from the Escondido River (purchase) (26738); 22 specimens, representing 22 species of birds' skins from Nicaragua (purchased for World's Columbian Exposition) (26809); crab, *Pseudothelphusa* sp. nov. (gift) (27128).
- RICHMOND, W. L. (Washington, D. C.). Specimens of *Anolis principalis*, from Savannah, Ga. 26732.
- RIDGWAY, AUDUBON (Brookland, D. C.). Snake and salamanders. 26940.
- RIDGWAY, ROBERT (U. S. National Museum). Birds' skins from Richland County, Ill., and Knox County, Ind., (26275); nest of wood pewee, *Contopus virens*, from Brookland, D. C., (26642); 4 specimens of red-breasted nuthatch, *Sitta canadensis* (26646). (See under S. O. Miner; and Smithsonian Institution. U. S. National Museum.)
- RIDLER, J. (St. Paul, Minn.), through Forest and Stream Publishing Co. Small-mouthed green bass, *Micropterus Dolomieu* from Lake Ida, Minnesota. 25912.
- RILEY, Prof. C. V. (See under Department of Agriculture, E. Brunetti, H. Caracciolo, William J. Fox, J. T. Mason, Dr. J. H. Mellichamp, and Prof. A. L. Montandon.)
- RITTENHOUSE, L. C. (Louisa, Ky.). Sigillaria with fragments of calamites on the reverse side. 26937.
- ROBBINS, IRVIN (Indianapolis, Ind.). Badge of G. A. R. 26246.



- ROBERTS, H. (Tryonville, Pa.). Fossil bones of *Elephas Colombi*. 26271.
- ROBERTS, W. F. (Washington, D. C.). Snakes. 25940.
- ROBINSON, AMOS G. (Fort Mitchell, Ala.). Snake. 26068.
- ROBINSON, H. A. (Kingston, N. Mex.). Juniper wood carved by termites. 26854.
- ROBINSON, T. B. (Des Moines, Iowa). Badge of G. A. R. 26249.
- ROBINSON, Lieut. WIRT, U. S. Army (Fort McPherson, Atlanta, Ga.). Humming-birds from Bogota, South America, (26592); 127 specimens of birds' skins from Colombia and the Island of Curaçao (26700); land-shells from the Island of Curaçao, West Indies (26986).
- ROCKHILL, W. W. (Berkeley Springs, W. Va.). Photo-negatives (deposit) (26505); collection of ethnological objects from China and Thibet (purchase) (26511); small box from Lanchou Fu, capitol of Kansu, used by opium smokers to hold the pills which are taken after smoking (gift) (26571); Colt's revolver and holder (deposit) (returned) (26625); books and specimens relating to Thibetan subjects, Thibetan spear (purchase) (26712); collection of about 300 Mongolian and Thibetan ethnological objects, with classified and detailed descriptions (purchase) (27007).
- ROMEYN, Capt. HENRY, U. S. A. (Mount Vernon, Ala.). Lubber-grasshopper, *Dictyophorus micropterus* Serv. 26064.
- ROMMEL, F. A. (Baltimore, Md.). White Russian, or Bokhara, trumpeter fowl. 26243.
- ROOT, Mrs. E. C. (See under Wallace and Earl Root).
- ROOT, WALLACE and EARL (Streetsboro, Ohio), through Mrs. E. C. Root. Devonian fossils. 25965.
- ROSEBROOK, JOSEPH W. (Toledo, Oreg.). Bird's nest and eggs; 3 species of lepidoptera. 25979.
- ROSENTHAL, ALBERT (Philadelphia, Pa.). Collection of etched and lithograph portraits of members of the Federal Convention of 1787, the Congress of 1787, the Congress of 1789, and of other prominent Americans (26800); etched and lithograph portraits of members of the Continental Congress (26801). Deposited for the World's Columbian Exposition.
- ROTHROCK, D. M. (Wyandotte, Ind.). Stalactites from Wyandotte Cave. Purchased for World's Columbian Exposition. 26172.
- ROWLANDS, WALTER (Allston, Mass.). Collograph "Charles I demanding the five impeached members", from the painting by Copley. 26272.
- ROYAL MUSEUM (Berlin, Germany). Collection of casts of Assyro-Babylonian and Greek religious objects. Purchased for World's Columbian Exposition. 26943.
- ROYAL MUSEUM (Florence, Italy), through Prof. Henry H. Giglioli, director. Two musical instruments, 100 archaeological objects, consisting of fragments of pottery, shells, fragments of bone, piece of quartz from a kitchen midden near Port Blair, South Andaman Islands; ramus of lower jaw, teeth, and bones of *Ursus spelaeus*, from a cave near Breonis (Verona); collection of ethnological objects from the Andaman Islands, and additional objects from different parts of the world. Exchange. 25949.
- RUMPLE, J. W. (Grottoes, Va.). Section of stalactite. Purchased for World's Columbian Exposition. 26787. (See under The Grottoes Company.)
- RUPPERT, ALLEN. (See under S. N. Rhoades.)
- RUSSELL, Prof. I. C. (See under Interior Department. U. S. Geological Survey.)
- RYUS, FLOYD E. (Childress, Tex.) Specimens of *Characampa tersa* and *Arctia arge*. 26111.
- SAFFORD, Prof. J. M. (Vanderbilt University, Nashville, Tenn.). Two fragments of the Safford meteorite from Tennessee. 26056.
- SAFFORD, W. E. (ensign, U. S. N.). Collection of Indian portraits and costumes (purchased for World's Columbian Exposition) (25958), ethnological objects from the Indians of Peru (deposit) (26315).
- SAGE, JOHN H. (Portland, Conn.). Nest and eggs of golden-winged warbler. 26755.

- SAL MOUNTAIN ASBESTUS COMPANY (Chicago, Ill.), through G. P. Merrill. Asbestos from mines near Nachoochee, Ga. 27042.
- SANDBERG, C. P. (London, England). Sections of Sandberg Goliath-rail and splice-bar. 26634.
- SANXAY, J. P. (See under Arizona Onyx Company.)
- SAUNDERS, H. R. (Nassau, New Providence). Nassau sponges. 26814.
- SAWYER, Capt., U. S. A. (See under Bureau of American Republics.)
- SCHAUPP, F. G. (See under Department of Agriculture.)
- SCHLIEMANN, Madame (Athens, Greece), through Hon. Truxton Beale. Antiquities obtained by the late Prof. Schliemann from the site of ancient Troy. 27023.
- SCHLÜTER, WILHELM (Halle, Germany). Two skins of pheasant (*Phasianus mongolicus* and *Phasianus principalis*) from Asia, 2 specimens of Mlokosiwiczi's black cock, *Tetrao Mlokosiwiczi* from Caucasus Mountains, 14 birds' skins (chiefly trogons and toucans) from various countries (purchased for World's Columbian Exposition) (26010, 26116, 27021); specimen of *Nenopus mülleri* from East Africa (purchased) (26506).
- SCHMID, EDWARD S. (Washington, D. C.). Gray African parrot and golden oriole (gift) (26472); 2 specimens of lesser prairie hen, *Typanuchus pallidicinctus* (purchased for World's Columbian Exposition) (26590); monkey (*Hapale rosalia*) (gift) (26629); lizard (*Tupinambis teguixin*) from South America (gift) (26649); parrot (*Nymphicus novaehollandie*) (gift) (26655).
- SCHOFF, S. A. (Greenfield, Mass.). Etching, "Portrait of Mrs. Otis," after Stuart. 27107.
- SCHULZ, DR. AUVEL (Johannesburg, Transvaal, South Africa). Gold-bearing conglomerate and ferruginous rock from the Johannesburg Mines. 26546.
- SCHUMANN, Mr. (See under Romya Hitchcock.)
- SCHWARZ, E. A. (Washington, D. C.) Coleoptera, illustrating the Saline fauna of Great Salt Lake (gift) (26032); North American coleoptera, all new to the collection (exchange) (26424); specimen of *Sesia pictipes* (gift) (27110).
- SCIENCE COLLEGE IMPERIAL UNIVERSITY (Tokio, Japan). Two birds from the province of Owari, Japan. 25937.
- SCOLLICK, J. W. (U. S. National Museum). Skeleton of cochon fowl, and external skeleton of *Pseudopus Pallasii*. 26473.
- SCOTT, W. W. (Canal Dover, Ohio), through George W. Crites. Siliceous concretion. 26968.
- SCRIVEN, Lieut. GEORGE P. (U. S. A.). (See under John Keith.)
- SEANEY, O. E. (Fort Wayne, Ind.). Collection of old-fashioned hats and bonnets. 26694.
- SEER, A. S., THEATRICAL PRINTING COMPANY (New York City). Poster, cut on wood (portrait of Alexander Salvini). 26036.
- SELLERS, JOHN, & SONS (New York City). Collection of tools and material used for etching. Purchase. 26850.
- SEWALL, H. F. (New York City). Two prints, representing Mantegna's "Madonna and Child," and Marcantonio's "Virgin on Clouds." Lent for exhibition at World's Columbian Exposition. 26718. Returned.
- SEWARD, Miss OLIVE RISLEY (Washington, D. C.). Cypriote collection, including specimens of Phœnician pottery, glasswork, Roman pottery, and other objects (25918); 104 specimens of Cypriote pottery, lamps, vases, dishes, glass jars, and other ethnological objects (25988). Deposit.
- SHEPARD, Dr. C. U. (Charleston, S. C.). Minerals, including rutile, from Graves Mountain, Georgia, staurolite from Morganton, and apatite, augite, and titanite from Canada. 26547.
- SHEPARD, Miss IDA (Long Beach, Cal.). Marine shells (25919). Pleistocene fossils (26907).

- SHERMAN, CHARLES A. (Wyoming). Blades of stone skin-scraper. 26618.
- SHERMAN, JOHN D., Jr. (New York City). Coleoptera (exchange) (27000); North American coleoptera (gift) (27027).
- SHERMAN, Gen. (See under Mrs. M. C. Audenreid.)
- SHOTWELL, J. R. (Rahway, N. J.). Skull of "Obenobbe," a Pottawatamie chief. 26593. (Transferred to Army Medical Museum.)
- SIEFELDT, Dr. R. W., U. S. A. (Takoma Park, D. C.). Reptiles, and 5 specimens of common shiner, or red-fin dace, *Notropis megalops*. 25888. (See under W. Wyndham.)
- SHUGIO, HIEROMICH (New York City). Forty-three pieces of Japanese pottery, 2 pieces of Chinese pottery, and 1 piece of Spanish pottery (gift) (25910); 28 pieces of Japanese pottery (purchase) (26929); 100 specimens of Japanese porcelains and pottery (deposit) (27066).
- SIBASIO, UNGER (Cape Colony, South Africa). Musical bow. Purchase. 26185.
- SIBLEY, Mr. (No address given). Shell from the Dry Tortugas. 26023.
- SIEMENS, WILLIAM (Berlin, Germany). Facsimile of a letter, dated November 20, 1833, written by Prof. Gauss, in relation to the installation of the first electric telegraph in Gottingen. 26086.
- SIGOURNEY, C. F. (Washington, D. C.). Yellow-bellied sapsucker, *Sphyrapicus varius*, in the flesh. 26312.
- SIMONIS, M. L'ABBÉ PAUL MÜLLER (Strasburg, Germany). Photograph representing the festival of Beiram Ali, as practiced by the Persian Mohanmedans. 26555.
- SIMPSON, CHARLES T. (U. S. National Museum). Six species of *Streponatida* from different parts of the United States (new to the collection). 26099. (See under C. Dwight Marsh and Bryant Walker.)
- SINGLEY, J. A. (Austin, Tex.). Fresh-water shells (26831); skin of California gull, *Larus californicus* (26692); birds' skins from Galveston (26697). (See under Geological Survey of Texas.)
- SIZER, FRANK L. (See under Capt. F. P. Spratt.)
- SKINNER, A. (Smithsonian Institution). Specimen of a partial Albino bob-white, *Colinus virginianus*, from the vicinity of Washington (26416); 2 pieces of flint (26465).
- SKINNER, O. E. (Claremont, Va.). Cocoon of cecropia-moth. 25903.
- SKOW, LAWRENCE (Omaha, Nebr.). Hybrid tanager (*Piranga rubra erythromelas*). Exchange. 26677.
- SMITH, E. KIRBY (Vera Cruz, Mexico), through Capt. C. E. Bendire, U. S. Army. Fossil shell, *Hippurites calamitiformis* Barcena, from a cave at the headwaters of the Rio Coatzacoalas, Mexico. 26730.
- SMITH, H. I. (Madisonville and South Lebanon, Ohio, Ann Arbor and Saginaw, Mich.). Fossils from the wash on the rock exposures near Madisonville (25939); cedar-root grown around a rock (26035); crayfishes (26104); crayfish from Little Chain River (26350); crayfish from near South Lebanon, and surface crustaceans and other specimens from Saginaw River and vicinity (26353); fresh-water crustaceans from First Sister Lake, near Ann Arbor (26551); crayfishes (26570); crayfishes from Michigan and Ohio (26644).
- SMITH, Dr. H. M. (See under Fish Commission, U. S.)
- SMITH, H. S. (Saginaw East Side, Mich.). Helgrammites, or larvæ of *Corydalus cornutus*. 26223.
- SMITH, Prof. JOHN B. (New Brunswick, N. J.). Noctuidæ (chiefly type specimens). 25977.
- SMITH, R. W. KIRBY (Sewanee, Tenn.). Birds' eggs, representing 5 species, from the vicinity of Jataplan, State of Vera Cruz, Mexico. 26581.
- SMITH, Dr. S. J. (Bangkok, Siam), through General John A. Halderman. Specimens of Siamese writing. 26189.
- SMITH, WILLIAM G. (Loveland, Col.). Long-tailed weasel, *Putorius longicauda*, and Fremont's squirrel, *Sciurus hudsonius Fremonti*. Purchase. 26445.

SMITHSONIAN INSTITUTION. Medal to commemorate the one-hundredth anniversary of the battle and massacre of Wyoming, July 3, 1778, to July 3, 1878, presented to the Smithsonian Institution by the Wyoming Historical and Geological Society, of Wilkesbarre, Pa. (gift) (26263); old custom tariff of the Republic of Texas, as modified by the Second Congress, obtained by F. J. Stringfellow, Crewkerne, Somerset, England (gift) (26266); medal in commemoration of the visit of His Imperial Majesty the German Emperor to the city of London, on July 10, 1891, a gift to the Smithsonian Institution from the Corporation of the City of London, through Sir John Monekton (gift) (26524). Through W. C. Winlock: Bronze commemorative medal conferred by the Columbian Historical Exposition at Madrid in 1892 in recognition of the exhibit of the Smithsonian Institution (deposit) (26988).

*Bureau of Ethnology*, under direction of the Smithsonian Institution, Maj. J. W. Powell, director.

An interesting collection of ethnological objects, consisting of a papoose cradle (porcupine embroidery), pair of traveling-bags, bottle, ball, spoon, ornamented horn spoon, stiletto case, pair of garters, pair of moccasins, ornamented turtle, a tobacco-pouch and small bag (for World's Columbian Exposition) (26105); ethnological objects from the Kiowa tribe of Indians, apparatus belonging to the ghost dance, and miscellaneous objects obtained from the Sioux and other Indian tribes, by James Mooney (for World's Columbian Exposition) (26286); collection of Indian costumes, war-clubs, saddles, and other objects, collected by Lieut. Cooke, U. S. Army, for exhibit at the World's Columbian Exposition (purchase) (26404); collection of Navajo Indian silverware, collected by George F. Kunz (purchased for World's Columbian Exposition) (26475); black steer robe, painted with tribal history by a Piegan Indian, transferred from the Bureau of Ethnology to the National Museum for World's Columbian Exposition (26525); carrying-basket obtained from the Pima Indians, and transferred from the Bureau of Ethnology to the National Museum for the World's Columbian Exposition (26631); fine collection of Indian baskets obtained by H. W. Henshaw, and deposited in the National Museum (26635); plaited, woven, and coiled baskets, silversmiths' tools, and other objects obtained by Mr. James Mooney from the Moki Indians of New Mexico (purchase) (26756); 13 ethnological objects collected in Oklahoma by Dr. A. S. Gatschet, and transferred from the Bureau of Ethnology to the National Museum for the World's Columbian Exposition (26843); 8 blankets obtained from the Navajo Indians, and transferred from the Bureau of Ethnology to the National Museum for the World's Columbian Exposition (26905); 3 baskets made by the Biloxi Indians of Louisiana (27108); collection of costumes and ceremonial objects belonging to Indian tribes (deposit for World's Columbian Exposition) (25905). (See under Rev. H. N. Voth.)

U. S. *National Museum*, under direction of the Smithsonian Institution, Dr. G. Brown Goode, assistant secretary in charge.

Collected by Frank X. Holzner: Birds' skins and mammal skins and skulls from the United States and Mexican boundary, and transmitted by the International Boundary Commission to the National Museum (26471); 38 specimens, representing 16 species of birds' skins, mammal skins, and skulls obtained from the same localities (26528); 17 specimens, representing 10 species of birds' skins from Arizona, and mammal skins (26553).

Purchased by Walter Hough for the National Museum: Collection of ethnological and sociographic articles from Spain also 16 musical instruments and 12 pieces of Spanish earthenware (26981).

Collected by P. L. Joly: Birds' skins, pottery, specimens of *Couorhinus dimidiatus*, toggle used in drawing the cinch tight over a pack-load, crustaceans, reptiles, specimens of *Spermophilus grammurus* and *Sciurus* sp., and specimens of *Ami-*

*urus dugesi*, *Algansea*, *Hudsonius*, *Fundulus*, *Characodon*, *Menidia*, from Mexico (25887); 14 mammal skins with skulls and 2 extra skulls, birds' skins from Mexico (25901); skins and skulls of mammals, turtles, and alcoholic specimens of reptiles, plants, alcoholic crabs, leeches, and shrimp, pair of gaiti used in cock-fighting, comb used by weavers to separate threads in weaving "Rebozo." "quactacomate," alcoholic specimens of birds for skeletons, obsidian spear-head, specimens of pottery, fragments of pottery and clay figures, bird-skin from Mexico (26207); mammal skins and skulls, alcoholic specimens of lizards, plants, birds' skins, alcoholic specimens of fishes from Mexico (26956); fishes, birds' skins, miscellaneous alcoholic insects and a Morpho-butterfly, crabs, shells, reptiles, mammal skins, and skulls from Mexico (26967).

Collected by G. P. Merrill; Cave materia's from Wyandotte Cave, Indiana, obtained for the World's Columbian Exposition (26101, 26134); land-shells from Wyandotte, Ind., and San Quention, Lower California (26123); cave material from Marengo, Ind., obtained for World's Columbian Exposition (26133); cave material from Percy & Robertson's cave, Springfield, Mo. for World's Columbian Exposition (26215); stalactites and stalagmites, from Andersonville, Tenn., for World's Columbian Exposition (26260); geological specimens from north of Phoenix, Ariz., (26344); 2 specimens of aragonite from onyx quarry, Yavapai County, Ariz., (26464).

Collected by William Palmer: Skin and skull of *Tamias striatus*, specimen of young guinea-fowl, *Numida meleagris*, 21 eocene fossils from Pamunky River marlbeds, and 3 snakes from Hanover County, Va. (25928).

Collected by Robert Ridgway: Two specimens of turkey-buzzard, *Cathartes aura*, and of crow (*Corvus americanus*) (26686).

Through William Palmer: Parrot (*Amazona fainosa*) (26066).

• National Zoological Park, under direction of the Smithsonian Institution.

Through Dr. Frank Baker, acting manager: *Cariacus virginianus* (25933); bay lynx, *Lynx rufus* (26073); coyote (*Canis latrans*) and llama (*Lama glama*) (26074); prong-horned antelopes, *Antilocapra americana* (26139); bird-spider, *Euryppelma Heatzii* (26162); macaw (*Ara scvera*) (26179); monkey (*Cebus* sp.), male juv., from South America, and red foxes, *Vulpes fulvus*, male, juv. (26325); cinnamon-bear, *Ursus americanus*, from Mammoth Hot Springs (26327); peccary (*Dicotyles tajacu*) (26328); coyote (*Canis latrans*), male, and llama (*Lama glama*), female, from Peru (26332); 2 specimens of coyote (*Canis latrans*), female, 3 deer (*Cariacus*, sp.), 2 males and 1 female, monkey (*Chrysothrix sciurca*), male, and a llama (*Lama glama*) (26338); monkey (*Hapale jacchus*) and porcupine (*Erethizon dorsatus*) (26396); white ibis, *Guara alba* in transitional plumage (26407); bear (*Ursus*, sp.), (26450); sulphur-crested coekatoo (26482); peccary (*Dicotyles tajacu*) and monkey (*Cerocebus fuliginosus*) (26523); peccary (*Dicotyles tajacu*) (26544); specimen each of red-fox, *Vulpes fulvus*, and skunk (*Mephitis mephitis*) (26563); golden eagle, *Aquila chrysaetos* in the flesh (26610); skunk (*Mephitis mephitis*), 2 specimens of kit-fox, *Vulpes velox*, and a monkey (*Cebus hypoleucus*) (26654); raccoon (*Procyon lotor*) (26702); skunk (*Mephitis mephitis*) (26740); specimen each of beaver (*Castor canadensis*) and porcupine (*Erethizon dorsatus*) (26762); Humboldt's monkey, *Lagothrix Humboldtii* (26793); specimen each of spermophile (*Spermophilus grammurus*), Angora-goat, *Capra hircus angorensis*, and hedgehog (*Erinaceus europaeus*) (26807); specimen of prairie-dog, *Cynomys ludovicianus* (26823); magpie in the flesh (26872); American magpie, *Pica pica ludsonica* in the flesh (26879); white-throated sapajou, *Cebus hypoleucus* (26900); squaw-duck (26957); 2 specimens of monkey (*Cebus* and *Chrysothrix*) (27044); Amazon parrot, *Amazona amazonica* in the flesh (27068); salamander (*Spelerpes ruber*) (27114); 2 specimens of *Ursus americanus*, and a llama (*Lama glama*) (27144).

SMOLINSKI, JOSEPH (Washington, D. C.). Starfish from the Adriatic Sea, 2 shells,

- Pinna carbea* from the Isle of Lida, off the city of Venice, and a dried specimen of sea-horse, *Hippocampus heptagonus* from the Adriatic Sea (26836); specimen of *Gnaphalium leontopodium*, the "Edelweiss" of central Europe (27045).
- SNYDER, BLADEN T. (Paris, France). Bill of lading dated Bristol, July 5, 1765. Exchange. 27093.
- SOUHAMI, SADULLAH & Co. (Tarakdjilar Han, Constantinople, Turkey). Collection of objects representing Mohammedan and Jewish religious observances and costumes of Greek and American priests. Purchased for World's Columbian Exposition. 26942.
- SOUTHWICK & CRITCHLEY (Providence, R. I.). Two skins of heath-hen, *Tympanuchus cupido*, from Martha's Vineyard, Mass. (26502, 26591). Purchased for World's Columbian Exposition.
- SPAINHOUR, J. M. (Lenoir, N. C.). Collection of 697 small leaf-shaped implements found *en cache*, stone with worked flat surface on side and end, an unfinished stone pipe, and 15 large leaf-shaped implements found *en cache*. 27001.
- SPEARS, J. R. (Northwood, N. Y.). Collection of photographs. 26109.
- SPENCER, EMMONS (Big Pine, Cal.). Infusorial earth. 27099.
- SPICER, Capt. JOHN O. (New London, Conn.). Eskimo coat and pants obtained by Capt. Clisby. 26309.
- SPRAGUE, JOHN C. (New York City). Sets of eggs of sharp-tailed sparrow, chickadee, kingfisher, and red-tailed hawk. 26186.
- SPEATT, Capt. FRANK P. (Helena, Mont.), through Frank L. Sizer and Mark W. Harrington. Fragments of sapphire. 26950.
- SPRINKEL, J. W. (Dulinsville, Va.). Dried salamander (*Diemyctylus miniatus*). 26638.
- SQUYER, HOMER (Mingusville, Mont.). Fossils (26933, 27122); specimens of *Anodonta plana* Lea (26941); land and fresh-water shells (26973).
- STABLER, HAROLD B. (Sandy Spring, Md.). Blue-jay, *Cyanocitta cristata* in the flesh, (26268); barred-owl, *Syrnium nebulosum*, and field-sparrow, *Spizella pusilla*, in the flesh (26498).
- STABLER, HAROLD B. and JAMES (Sandy Spring, Md.). Star-nosed mole, *Condylura cristata*. 26210.
- STABLER, JAMES (Sandy Spring, Md.). Red-tailed hawk, *Buteo borealis*, in the flesh. 26408.
- STALING, F. (Harrisonburg, Va.). Stalagmatic marble. 26085.
- STANTON, T. W. (U. S. Geological Survey). Concretions from near Castle Gate and Scofield, Utah. 26476.
- STARIN, JOHN H. (New York City). Large colored crayon of Saratoga Battle Monument at Schuylersville, N. Y. 26954.
- STATE, DEPARTMENT OF. (See under Henry W. Andrews, Columbian Historical Exposition, and Treasury Department.)
- STEARNS, Dr. R. E. C. (U. S. Geological Survey). Piece of Japanese pottery. 26932.
- STECKELMAN, CARL (Mayumba, Africa), through George C. Webster. Pottery and collection of ethnological objects and musical instruments from Africa. 26257.
- STEINBECK, WILLIAM (Hollister, Cal.). Set of eggs of *Elanus leucurus*. 26122.
- STEJNEGER, Dr. LEONHARD (U. S. National Museum). Two specimens of *Chasiempis Gayi* Wilson, sp. nov., from Oahu, Sandwich Islands (26497); 10 specimens of birds' skins from Bering Island, Kamtschatka (26558); specimen of *Catocala relieta* Walk, from San Francisco Mountains, Arizona, obtained at an elevation of 8,000 feet (27081). (See under George E. Harris and Jerome Lightfoot.)
- STEPHENS, F. (Santa Ysabel, Cal.). Fossil wood from the Colorado Desert, about 6 miles east of Borego Springs (26805); 27 reptiles from Colorado Desert, including 4 specimens of the horned toad, *Phrynosoma McCallii* (25989).
- STERKI, Dr. (See under Geological survey of Texas.)
- STERNBURG, BARON H. S. (chargé d'affaires of Germany, Peking, China). Skin of antelope (*Nemorhadus caudatus*) from the mountain region of north China. 27121.

- STEUART, C. A. (See under L. L. Baker.)
- STEUART, H. B. (Garrettsville, Ohio). Butterfly (*Papilio ajar*). 26277.
- STEUART, Gen. J. E. P. (See under William B. Cary.)
- STEVENSON, Mrs. CORNELIUS (Bryn Mawr, Pa.). Photograph of Ramses. 25956.
- STILWELL, L. W. (Deadwood, S. Dak.). Fossil from Suggs, Wyo. 26091.
- STODDARD, S. R. (Glens Falls, N. Y.). Photographs illustrating views in the vicinity of Howe's Cave, N. Y. Purchased for World's Columbian Exposition. 26129.
- STORY, J. L. (The Dalles, Oreg.), through George F. Kunz. Two specimens of opal. 26431.
- STRINGFELLOW, F. J. (See under Smithsonian Institution.)
- STUART, L. W. (Monmouth, Iowa). Collection of 125 Niagara and Silurian fossils from Iowa. 25929.
- STURGE, JOSEPH (Birmingham, England). Fruit-eating bat, *Brachyphylla cavernarum*. 27119.
- SULZBERGER, D. (Philadelphia, Pa.). Knife used for the slaughter of cattle, according to the Jewish rite. Deposit. 26398.
- SULZBERGER, MAYER (Philadelphia, Pa.). Eleven volumes illustrating the ceremonies and religious costumes of the world (26121); miniature copy of the Pentateuch (26817).
- SWINGLE, Mr. (See under H. J. Webber.)
- TABER, CHARLES, & Co. (New Bedford, Mass.). Nine collographic prints, "artotypes." 26527.
- TAKAYANAZI, T. (New York City). Eight pieces of Japanese pottery. Purchase. 26931.
- TALMAGE, J. E. (Deseret Museum, Salt Lake City, Utah). Two microscopic slides of male and female specimens of the brine-shrimp, *Artemia fertilis* Verrill, and a photo-micrograph of the female *Artemia*. 26459. (See under Deseret Museum.)
- TAIT, Mrs. LIZZIE J. (See under The Woman's College of Baltimore.)
- TATE, WILLIE B. (Washington, D. C.). Four specimens of *Argiope riparia* Hentz. 26184.
- TAYLOR, CHARLES (New Britain, Conn.). G. A. R. badge of Stanley Post No. 11. 26227.
- TAYLOR, Miss ELIZABETH (Troy, N. Y.). Birds' skins from western Manitoba and the Mackenzie River delta (26518); birds' nests and eggs from British North America; birds' skins from western Manitoba; harlequin duck from the rapids of Drowned Slave River; bird skeleton, Eskimo needle-case, and 115 specimens of plants from the Mackenzie basin. (26519).
- TAYLOR, Rev. GEORGE W., D. D. (St. Barnabas Rectory, Victoria, B. C.). Specimens of *Aemua* from British Columbia and Japan. 26136.
- TAYLOR, Gen. RICHARD. (See under Thomas J. Armstrong.)
- TAYLOR, Mrs. V. W. (Leitchfield, Ky.). Silk-moth, *Telea polyphemus*, and 2 swallow-tail butterflies. *Papilio troilus*. 25993.
- TAYLOR, WILLIAM TATE (Bannack City, Mont.), through Dr. W. H. Melville. Gold in calcite, and two specimens of tiemannite from Piute County, Utah. 26585.
- TEGIMA, S. (University of Tokio, Tokio, Japan). Two photographs of a meteoric stone which fell at Maémé, Hishgori County, Province of Satsuma, Japan, in 1886. 26145.
- TEST, FREDERICK C. (U. S. National Museum). Green frog, *Rana pipiens*, from Ocean City. 25995.
- THE ALASKA INDIAN BAZAAR (Chicago, Ill.). Net-maker's outfit, consisting of grass, hackle, shuttle, spindle, and net. Purchase. 27101.
- THE ART PUBLISHING COMPANY (Boston, Mass.). Twenty-seven specimens of photo-mechanical process work. 26716.
- THE COLORADO TURKEY HONE STONE COMPANY (Denver, Colo.). Four whetstones and a grindstone. 26566.

- THE FORBES LITHOGRAPH MANUFACTURING COMPANY (Boston, Mass.). Sixteen specimens of photo-lithographic work, etc. 26421.
- THE GROTTOS COMPANY (Shenando, Va.), through J. W. Rumble, president, and E. C. Pechin, general manager. Collection of cave materials from grottoes, collected by W. H. Newhall, of the National Museum, for World's Columbian Exposition. 26481.
- THE KNAPP AND COWLES MANUFACTURING COMPANY (Bridgeport, Conn.). Eight mincing-knives. 26283.
- THE MASSACHUSETTS ARMS COMPANY (Chicopee Falls, Mass.). Objects illustrating the composition of the Maynard rifle. Deposit. 26835.
- THE PASADENA LOAN ASSOCIATION (Pasadena, Cal.), through Miss Annie L. Pitcher. Plants used in their arts by the aborigines of Los Angeles and San Fernando, Cal. 26474.
- THE SCOTT STAMP AND COIN COMPANY (New York City). Colonial and other American medals (purchased for World's Columbian Exposition) (25975); colonial and continental paper-money. Purchase. (25991.)
- THE WOMAN'S COLLEGE OF BALTIMORE (Baltimore, Md.), through Arthur Bibbins, curator. Specimen of *Branchiostoma lanceolatum*, obtained from Fort Tampa, Fla. by Mrs. Lizzie J. Tait, and specimens of *Cordylophora lacustris* Allm., bearing gonophores, collected from the pier of Fort Carroll, Patapsee River. 26785.
- THE WYOMING HISTORICAL AND GEOLOGICAL SOCIETY (Wilkesbarre, Pa.). Medal to commemorate the 100th anniversary, July 3, 1878, of the battle and massacre at Wyoming, July 3, 1778. 26254.
- THOMAS, DR. CYRUS. (See under Miss Ernestine Mager.)
- THOMPSON, J. H., JR. (Patterson, N. Y.). A young barred Plymouth Rock cock, in the flesh. 26521. (See under R. P. Thompson.)
- THOMPSON, R. P. (Patterson, N. Y.), through J. H. Thompson, jr. A young White Cochin cock, in the flesh (26522); 2 white cochin hens (27024).
- THOMPSON, WILLIAM NELLES (Chatham, Ontario, Canada). Wampum belt said to have belonged to Tecumseh. Purchase. 26237.
- THORNTON, H. R. (New York City). Ivory coat of mail belonging to the Eskimo tribe of Cape Prince of Wales, and plates of iron dug up from the same locality. Purchased for World's Columbian Exposition. 26018.
- THORNTON, M. E. (Hickory, N. C.). *Gordius* from a fish-pond at Bridgewater, N. C. 26419.
- THORPE, DR. H. H. (Liberty Hill, Tex.). Oyster shells cemented together (25886); fossils (25964); collection of pearls and corals, also string of coral (26764).
- TIFFANY & Co. (New York City). Silver Korau case and 2 silver Mohammedan talismans (26347). Purchased for the World's Columbian Exposition.
- TINKHAM, ASA W. (Brockton, Mass.). G. A. R. knapsack badge. 26228.
- TISDEL, W. P. (Washington, D. C.). Marimba from Santiago de Veragua, Province of Chiriqui, Colombia. 27067.
- TORY, F. H. (Fort Huachuca, Ariz.), through Capt. C. E. Bendire, U. S. A. Frontal bone of *Lepidosteus*. 26316.
- TODD, E. R. (U. S. National Museum). Chipmunk (*Tamias striatus*), (26137); barred-owl, *Syrnium nebulosum*, in the flesh, from near Lower Cedar Point, Maryland. (26258.)
- TOWNSEND, C. H. (U. S. Fish Commission). Alcoholic specimens of crayfishes; larva of crane-fly, alcoholic reptile, and fishes, representing the genera *Campostoma*, *Rhinichthys*, *Notropis*, *Semotilus*, *Phoxinus*, *Hybognathus*, *Catostomus*, and *Etheostoma*, from Westmoreland County, Pa. (27014); mammal skins (27017). (See under Fish Commission.)
- TRAILL, W. E. (Ashcroft, British Columbia). Specimen of *Sorex* sp., and alcoholic specimens of small salmon (*Oncorhynchus Kennerlyi*, Roach, and *Richardsonius*



- lateralis*) and dace (*Apocope vulnerata*), (25938); alcoholic specimens of fishes from Stuart's Lake, British Columbia, consisting of *Uranidea*, *Richardsonius*, *Salmo mykiss*, and *Salmo Keuwerlyi* (27103).
- TREASURY DEPARTMENT, U. S. Three skins of female seals and skin of pup seal, collected by J. Stanley Brown, while acting as agent in charge of the Seal Islands; for use in connection with the Bering Sea arbitration, and also skin of seal (*Phoca vitulina*), (26395); fur-seal skins, skulls, and bones, collected by the revenue steamer *Corwin* during her summer cruise, collected at the request of the Secretary of State in connection with the Bering Sea arbitration (26418).
- TRISTRAM, Rev. H. B. (The College, Durham, England). Birds' skins from New Guinea. Exchange. 25982.
- TRITSCH, ALBERT (Johannesburg, Transvaal, South Africa). Copies of the Rhodesia Chronicle and Mashonaland Advertiser, the Mashonaland Herald and Zambesian Times, printed in cyclostyle. 26747.
- TURNER, J. HENRY (through Alaska Commercial Company). Skulls of bear and moose, 4 birch-bark canoes, skin canoe, sled and ethnological objects, also fossil bones of Elephas (*Bison latifrons*), from Alaska. Purchase. 26892.
- TYLOR, Dr. EDWARD B. (Museum of Natural History, Oxford, England). Two photographs of pottery made by the Santa Clara Indians. 26491.
- ULRICH, E. O. (Newport, Ky.), through R. R. Gurley. Five specimens of *Inocaulis arbuscula* Ulrich, from Cincinnati group (lower beds). 26754.
- UNIVERSITY OF UPSALA (Upsala, Sweden), through Dr. Theo. Fries. Large collection of dried plants, principally from Brazil. Exchange. 26148.
- VALENTINE, E. K. (U. S. Senate). Copies of official programmes and Senators' tickets used in the Cleveland inaugural ceremonies in 1893. 26830.
- VANCE, Dr. J. R. (Stanton, Tex.). Texas rattlesnake. Purchased for World's Columbian Exposition. 26400.
- VAN DEMAN, H. E. (Department of Agriculture). Asphalt from Emery County, Utah. 26924.
- VAN EPPS, PERCY M. (Glenville, N. Y.). Copper key bugle. 27073.
- VAN RENSSELAER, Mrs. W. KING (New York City). Specimen of *Trombidium* from Weehawken, N. J. 26454.
- VAUGHAN, T. WAYLAND (Cambridge, Mass.). Fresh-water shells from Louisiana and Texas. 26903.
- VINTON, GEORGE W. (See under Illinois and Mississippi Canal Company.)
- VON IHERING, Dr. H. (Rio Grande, Rio Grande do Sul, Brazil). Land, fresh-water, and marine shells from Southern Brazil (26577); shells (26028).
- VON MUELLER, Baron FERDINAND (Melbourne, Victoria). Specimens of *Banksia odorata* and *Corysanthes unguiculata* (26034, 26120); herbarium specimens from Australia (26951).
- VON PHUL, Hon. FRANK (vice-consul, San Juan del Norte, Nicaragua), through S. C. Braida, U. S. consul. Spider (*Gasteracantha cancer* Hentz), from Greytown. 26373.
- VON STREERUWITZ, W. H. (Austin, Tex.). Specimens of marble from the Sierra Diablo and volcanic and metamorphic rocks from Van Horn Mountains, El Paso County (25999); ores and rocks (26080).
- VORMUS, ALBERT (Greenville, Miss.). Flint chips, fragment of bone, 5 fragments of pottery, and 6 pieces of burnt clay from a mound near Greenville. 27096.
- VOTH, Rev. H. N. (Lehigh, Kans.), through U. S. Bureau of Ethnology. Collection of Cheyenne Indian material, obtained by James Mooney and transferred from the Bureau of Ethnology to the National Museum. 26674.
- WADE, Mrs. LEVI (Allegheny, Pa.). Song by Mrs. Wade, dedicated to the ladies of New England. 26042.
- WAGGAMAN, THOMAS E. (Washington, D. C.). Three pieces of Japanese pottery. 26930.

- WALCOTT, CHARLES D. (See under Interior Department. U. S. Geological Survey.)
- WALKER, BRYANT (Detroit, Mich.), through C. T. Simpson. Specimens of *Anodonta*, representing 7 species. 26894.
- WALKER, DR. R. L. (Mansfield, Pa.). Thirty-three photographs of living animals. 26578.
- WALLACE, SAMUEL (Washington, D. C.). Homing pigeon. 26483.
- WALNUT, MRS. ADA U. (Los Angeles, Cal.). Collection of shells. 26399.
- WANSTALL, WILLIAM (Washington, D. C.). Baker's tally-sticks (four) used in Philadelphia in 1818. 26317.
- WARD, ROWLAND & Co. (London, England). Mounted heads of *Strepsiceros kudu*, *Orcas canna*, *Gazella walleri*, *Strepsiceros imberbis*, *Panholops Hodgsoni*, *Capra megaceros*, *Ovis polii*, *Boselaphus tragocamelus* (26898); 12 large mounted heads of mammals (26922). Purchased for World's Columbian Exposition.
- WARD'S NATURAL SCIENCE ESTABLISHMENT (Rochester, N. Y.). Game birds, chiefly foreign (25893)\*; skull of boa constrictor (26138)\*; specimen of precious coral (26200)\*; 2 enlarged models of skulls, one of a penguin and the other of a frog (26233)\*; peccary from Texas, sewellel from Washington, and meadow-mouse from Tennessee (26333)\*; model of skull of *Menopoma* (26401)\*; shell of argonaut, a paper *nautilus* (26402)\*; raccoon skin (26466)\*; disarticulated skeleton of horse (26598)\*; five mounted birds, viz. Bengal vulture, *Cypis bengalensis*, black vulture, *Catharista atrata*, English pheasant, *Phasianus colchicus*, emu, *Dromaius nova-hollandia*, adjutant, *Leptoptilus dubius* (26613)\*; Anzoux model showing complete anatomy of a turkey (26665)\*; mounted skeleton of man (26812)\*; geological material from various localities (exchange) (26853); spiny-tailed squirrel, *Anomalurus pelii*; pangolin, *Smutsia temminckii*; mole-rat, *Bathyrgurus maritimus*; wild ass, *Asinus onager* (purchase) (26864); 8 mounted mammals, viz. African mungoose, *Herpestes ichneumon*, Indian mungoose, *Herpestes griseus*, genet, *Genetta vulgaris*, fat-tailed sheep, *Ovis aries*, steatopyga, domestic goat, lop-eared rabbit, *Lepus cuniculus* var., guinea-pig, *Cavia aperea*, zebu, *Bibos indicus* (26867)\*; geological material (26885)\*; slab of serpentine and one of luxullianite from England, and slab of rapackivi granite from Finland (26895)\*; mounted specimen of colugo, *Galeopithecus volans* (purchase) (27130).
- WARNEKE, C. W. (Washington, D. C.). Specimen of *Putorius erminia*, in the flesh. 25931.
- WARREN, S. (White Springs, Fla.). Larva of bombycid-moth, *Lagona crispata*. 26365.
- WASHINGTON, LAWRENCE (Marshall, Va.). Washington's Bible (folio volume with autograph of George Washington on title-page, and his name printed in the list of subscribers at the end of the book; oil portrait of Maj. Lawrence Washington (half-brother of George Washington, who built the mansion and named the estate Mount Vernon, and who bequeathed the property to George Washington; commission of Lawrence Washington as major in the King's army on the expedition under Admiral Vernon. Deposit. 25899.
- WASHINGTON ONYX MINING AND MILLING COMPANY (Pomeroy, Wash.). Three specimens of opal from the "Onyx" mines in Garfield County, Wash. 26681.
- WATKINS, J. E. (See under M. W. Beecher and T. S. Bishop.)
- WEAVER, O. R. (Indianapolis, Ind.) Badge of the G. A. R., Department of Indiana. 26247.
- WEBB, ALEXANDER R. (U. S. consul, Manila, Philippine Islands). Thirty-six photographs representing natives and houses, streets, and other scenes at the Philippine Islands (26220); 4 native games, Manila milkman's outfit consisting of 6 pieces, native costume, hat, shirt and breeches, pair of shoes for wet weather, and a collection of clay kitchen vessels. 26320. †

\* Purchased for World's Columbian Exposition.

† These objects were purchased by Mr. Webb for the National Museum at the request of the Secretary of the Smithsonian Institution.

- WEBB, WALTER F. (Geneva, N. Y.). Six eggs of Audubon's shearwater, 10 eggs of man-o'-war bird, 20 eggs of sooty tern, 13 eggs of noddy tern, 12 eggs of booby from Bahama Islands, 3 eggs of cinnamon teal from California. 26278.
- WEBER, F. C. (Chicago, Ill.). Spider (*Argiope transversa* Hentz). 26180.
- WEBBER, H. J. (Eustis, Fla.). Turtle, in the flesh, obtained by Messrs. Webber and Swingle. 26906.
- WEBSTER, GEORGE C. (See under Carl Steckleman.)
- WEED, CLARENCE M. (Hanover, N. C.). Type specimens of North American harvest-spider, *Phalangium*. 26978.
- WEED, WALTER L. (Washington, D. C.). Kaolin from near Bethesda Park, Montgomery County, Md. 26826.
- WEEMS, DAVID G. (Baltimore, Md.). Photograph of Mr. Weems, inventor. 26406.
- WESLEY, WILLIAM & SON (London, England). Illustrated catalogue of the Anglo-Jewish Historical Exhibition (purchase) (26059); book entitled "Etching and Mezzotint Engraving," by H. Herkomer, London, 1892, illustrated (purchase) (26084); 6 photographs of Jewish antiquities (purchased for World's Columbian Exposition) (26241).
- WHITE, DR. C. H., U. S. Navy. Butterfly (*Timetas chiron*), obtained 200 miles off the northwestern coast of Mexico, 2 sphingid-moths, dragon-fly, and a specimen of *Hydrophilus* from Peru. 26964.
- WHITE, E. H. (Astoria, Oreg.). Land and fresh-water shells. 26340.
- WHITEAVES, J. F. (Geological Survey of Canada, Ottawa, Canada). Specimen of *Thetis affinis* Whiteaves, from Skidgate Inlet, British Columbia. 26623.
- WHITELAW, W. H. (Hartford, Conn.). Nutmeg, made from the original Charter Oak tree. 26480.
- WHITNEY, MISS ANNE (Boston, Mass.). Original plaster model of statue "Leif Erikson."
- WHITNEY, C. A. (Piedmont, S. Dak.), through L. M. McCormick. Dry skin of bat (*Corynorhinus Townsendii*). 26652.
- WHITTIER, JOSEPH H. (Manchester, N. H.), through S. S. Yoder. Badge of the Union Veterans Union, Department of New Hampshire. 26451.
- WHYTE, JAMES. (See under Dr. Elliott Cones, U. S. Army.)
- WICKS, M. L., JR. (Los Angeles, Cal.). Skin of short-tailed albatross, *Diomedea albatrus*. Exchange. 26550.
- WIDMANN, OTTO (Old Orchard, Mo.). Nest of Baltimore oriole, 3 nests of Traill's fly-catcher, and 3 nests of Acadian fly-catcher from the vicinity of St. Louis. 26839.
- WILCOX, Mrs. MARY E. D. (Washington, D. C.). Collection of Jackson relics, consisting of a walking-stick presented to Gen. Andrew Jackson by a friend; Turkish scimitar presented by the Sultan of Turkey to Gen. Jackson; watch worn by Gen. Jackson at the battle of New Orleans; bead watch-guard presented to him by his wife; comb presented by the ladies of New Orleans to Mrs. Jackson; ear-ear used by Mrs. Jackson; racing-purse used by the general; veil presented by the ladies of Cincinnati to Mrs. Jackson; sleeve of a dress worn by Mrs. Jackson at the grand ball in New Orleans in 1816; nullification proclamation, printed on satin; copy of appendix to Blackstone used by Gen. Jackson when studying law in Salisbury, N. C.; copy of Koran; card of trinkets belonging to Mrs. Jackson; miniatures on ivory of President and Mrs. Jackson. Deposit. 26196.
- WILCOX, A. C. (Washington, D. C.). Two arrow-heads found near Upper Marlboro, Md. 27097.
- WILCOX, GLOVER P. (Fort Huachuca, Ariz.). Eggs of *Icteria virens longicauda* and *Icterus parisorum*. 26168.
- WILCOX, JONES (East Chatham, N. Y.). Two silver Wyandotte fowls in the flesh (26628, 26670); silver-spangled Hamburg fowl.

- WILCOX, Dr. TIMOTHY E., U. S. A. (Fort Huachuca, Ariz.). Arachnida and myriopoda, alcoholic specimens of mammals, leeches, birds, and reptiles, collected by Dr. Wilcox, Master Harry Lawrence, Master Fred Ebert, Master Fred Fowler, Miss Bertha Rawolle, Miss Florence Scott, Messrs. Leahy and Walerius, hospital stewards, and E. Jenks, hospital corps (26403); insects from the vicinity of Fort Huachuca (26579). (See under C. H. Bales).
- WILKINSON, E. (Mansfield, Ohio). Fossil tooth of mammal. 26044.
- WILLCOX, JOSEPH (Philadelphia, Pa.). Minerals from various localities. Purchased for World's Columbian Exposition. 26829.
- WILLIAMS, F. H. (Greene, N. Y.). Two hammer-stones, 2 rude chipped implements, 3 notched sinkers, 20 knives, scrapers, and other objects (27082); 60 stone implements, fragments of pottery, and three vessels of steatite (27115).
- WILLIAMS, J. A. (Cloud Chief, Okla.). Fifth neck vertebra of an elk (*Cervus canadensis*). 26722.
- WILLIAMS, J. W. (Springfield, Mo.). Specimens of stalactites and stalagmites for the World's Columbian Exposition. 26307.
- WILLIAMS, Mrs. TALCOTT (Philadelphia, Pa.). Costume of man, costume of woman, a boy's costume, and man's cloak from Morocco. Purchased for World's Columbian Exposition. 26053.
- WILLIAMS, T. (Honolulu, Hawaiian Islands). Eighty-five photographs representing views of Hawaiian volcanoes. Purchased for World's Columbian Exposition. 26131.
- WILLIS, MERRITT (Bronx Mills, West Farms, N. Y.). Chipped flint dagger or spear-head from Illinois, 12 arrow-heads from West Chester, N. Y., 1 from Indiana, and 1 from California. 26008.
- WILLSON, GEORGE A. (Ashton, Md.). American barn-owl, *Strix pratincola*. 26050.
- WILSON, F. E. (Greenville, Ohio). Musket flint and small arrow-point, also 2 buttons, supposed to be relics of campaigns under Gen. St. Clair and Gen. Anthony Wayne during the Revolutionary War. 26746.
- WILSON, SCOTT B. (Surrey, England). Seventeen birds in alcohol from the Sandwich Islands. (26201, 26202). (Purchase, gift.)
- WILSON, THOMAS (U. S. National Museum). Archaeological objects, consisting of scrapers, arrow-heads, and similar objects from Le Teil, Selles-sur-Cher, Loir-et-Cher, France, obtained from the collection of A. Bonnet (26538); bronze sword and bronze hatchet from near Norfolk, England, (26795); 187 rude and leaf shaped implements, perforators, scrapers, arrow-heads, polished hatchets, grooved axes, pierced tablets and boat-shaped articles, hematite mullers, and a disk of banded slate from Ohio (26870). Deposit.
- WILTBERGER, JACOB (Brookland, D. C.). Rude implements and spear-heads of quartzite. 26443.
- WINLOCK, W. C. (See under Smithsonian Institution.)
- WINTON, GEORGE B. (San Luis Potosi, Mexico). Skin of pectoral bobwhite, *Colinus pectoralis* (gift) (26614); skins of imperial woodpecker, *Campephilus imperialis*, from Michoacan, Mexico (purchased for World's Columbian Exposition) (26893).
- WITCHELL, S. B. (San Antonio, Tex.). Cocoon of bag-worm, *Thyridopteryx* sp. 26001.
- WITTKUGEL, ERICH (San Pedro Sula, Honduras). Sixty specimens, representing 25 species of rare lepidoptera. Purchase. 26322.
- WITTICH, B. (Moline, Ind.). Fifty-four photographs illustrating the life and industries of the Indians of Arizona, New Mexico, and Lower California. 26244.
- WOOD, Miss E. M. (Cheshire, England). Six colored drawings of gregarinida (small parasitic invertebrates) (26234); five drawings of sponges and worms showing details of structure (27038). Purchased for World's Columbian Exposition.

- WOOD, NELSON (U. S. National Museum). Sumatra pullet. 26486.
- WOODWARD, ALBERT (Dayton, Wash.). Volcanic dust. 27132.
- WOODWARD, KARL W. (Washington, D. C.). Trunk of fossil tree from the Potomac formation of the District of Columbia. 26918.
- WOOSTER, A. F. (Norfolk, Conn.). Specimens of *Dicercia chrysea*, *Nyctobates pensylvanicus*, and *Lebia grandis*. 26777.
- WORTH, S. G. (U. S. Fish Commission). Specimen of *Unio hyalinus* Lea, from Tygart's River, West Virginia. 26448.
- WORTHEN, CHARLES K. (Warsaw, Ill.). Skin and skull of Yaguarundi's cat, *Felis jaguarundi*. Purchase. 26763.
- WRIGHT, BERLIN H. (Penn Yan, N. Y.). Collection of shells. 26780.
- WRIGHT, Prof. G. F. (Oberlin, Ohio). Glacial material from Ontario, Canada (26749); photographs illustrating phenomena of glacial drifts from Ohio to Canada (26786). Purchased for World's Columbian Exposition.
- WUNDERLICH, H. & Co. (New York City). Seventeen prints (26727); plate from Turner's "Liber Studiorum," and an etching by Jaeque (26863). Purchased for World's Columbian Exposition.
- WUNSTEN, CARL (Silver Cliff, Colo.). Nickel ores from Gem Mine, Fremont County, Colo. 27098.
- WÜRTELE, F. C. (Quebec, Canada). Bromide enlargement of a photograph of working model of S. S. "Royal William," and a copy of transaction No. 20 of the Literary and Historical Society of Quebec, Canada, sessions of 1889-1891, containing the account and certified statement of steamship. Purchase. 27036.
- WYANDANCE BRICK AND TERRA COTTA COMPANY (New York City), through D. G. Hartiman, secretary. Pyrite deposited on wood. 26508.
- WYARD, E. SAXON (Washington, D. C.). Eight large ornamented shells from the Indo-Pacific Ocean. 25966.
- WYNANT, W. P. (Bealeton, Va.). Horned grebe, *Colymbus auritus*. 26706.
- WYNDHAM, W. (H. B. M. consul, Surinam), through Dr. R. W. Shufeldt, U. S. A. Two crania of catfish, known as "crucifix" fish. 26267.
- WYOMING HISTORICAL AND GEOLOGICAL SOCIETY. (See under Smithsonian Institution.)
- YALE COLLEGE MUSEUM (New Haven, Conn.), through Charles E. Beecher, curator. Twelve slabs of erinoids from Crawfordsville, Ind. (26415); 325 specimens of fossil erinoids, brachiopods, and mollusca from the same locality (26977).
- YALE COLLEGE (New Haven, Conn.), through Prof. E. S. Dana. The Henry magnet. Deposit. 26705.
- YODER, S. S. (See under Joseph H. Whittier.)
- YOUNG, R. J. (Chrystoval, Ariz.). Two snakes. 27033.
- ZOOLOGICAL MUSEUM OF CHRISTIANIA (Christiania, Norway), through Prof. R. Collett, director. Alcoholic specimens of *Raia nidrosiensis*, *Raia fullonica*, *Chimera monstrosa*, *Spinax spinax*, *Bothus rhombus*, *Cottus scorpius*, *Callionymus lyra*, *Argentina sphyrena*, *Salvelinus alpinus*, *Onos mustela*, *Onos cimbrinus*, *Gadus esmarkii*, and *Raniceps ranimus*. Exchange. 26865.
- ZOOLOGICAL STATION (Naples, Italy). Collection of marine invertebrates. Purchase. 27047.

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## NOTE A.

ACCESSIONS RECEIVED IN THE MUSEUM DURING 1890-1891, FOR EXHIBITION AT THE WORLD'S COLUMBIAN EXPOSITION.

- BEATH, J. W. (Philadelphia, Pa.). Collection of gems and minerals. 24360. Fifteen specimens of intaglios of bloodstone, agate, carnelian, sardonyx, and labradorite. 24363.
- BRIMLEY, H. H. & C. S. (Raleigh, N. C.). Six mammal skins. 24271.
- ENGLISH, G. L., & Co. (New York City). Thirty-eight minerals. 24375.
- FOOTE, Dr. A. E. (Philadelphia, Pa.). Thirty-one minerals. 24370. Twenty-eight minerals. 24434.
- PENNYPACKER, C. H. (West Chester, Pa.). Seven minerals. 24441.
- SMITH, Dr. HUGH M. (U. S. Fish Commission). Bat. 24284.
- TIFFANY & Co. (New York City). Collection of gems. 24359.
- WITTKUGEL, ERICH (Honduras). Twelve mammals from Honduras. 24391.
- WORTHEN, C. K. (Warsaw, Ill.). Fourteen mammal skins. 24265.

## NOTE B.

ACCESSIONS RECEIVED IN THE MUSEUM DURING 1891-1892, FOR EXHIBITION AT THE WORLD'S COLUMBIAN EXPOSITION.

- ARMSTRONG, F. B. (Brownsville, Tex.). Two skins of chachalaca, *Ortalis vetula macalli*. 25866.
- BEATH, J. W. (Philadelphia, Pa.). Twenty-two cut stones consisting of agatized wood, smoky quartz, amethyst, garnet, sapphire, green and white onyx cameo, moonstone, fowlerite, sphalerite, and oligoclase, and a specimen of spinel in calcite from Ogdensburg, N. J. 25089.
- BOCCARD, A. (London, W. C., England). Eleven skins of birds of paradise, representing 11 species. 24946. Twenty-four specimens, representing 24 species of humming-birds' skins. 25047. Three specimens, representing 3 species of birds of paradise from New Guinea. 25458.



- DEYROLLE, EMILE (Paris, France). Four mounted mammals. 24819.
- DOWNS, A. C. (Realitos, Duval County, Tex.). Armadillo (*Tatusia novemcincta*). 25549.
- ENGLISH, G. L., & Co. (New York City). Eleven specimens of axinite, marcasite, fluorite, and calcite from various localities. 24975. Calcite ball from Japan and a specimen of stibnite from the same locality. 25238. Malachite slab from Siberia. 25420. Minerals from various localities, consisting of smoky quartz, chloropal, dolomite, pyrite, laumontite, mesite, titanite, azurite, native sulphur, rhodochrosite, minium, cassiterite, amber, ilvaite, and others. 25849.
- FOOTE, DR. A. E. (Philadelphia, Pa.) Specimen of matlockite and one of phosgenite from Cromford, Derbyshire, England. 25204. Eight specimens of rocks and other geological material. 25620 Minerals from various localities, consisting of calcite, pyrite, psilomelane, and barite. 25850.
- FOSTER BROS. (Boston, Mass.). Picture of Swiss glacier. 25659.
- FRAZAR, M. ABBOTT (Boston, Mass.). Skin of white ibis, *Guara alba* from Brownsville, Tex. 24936.
- GERRARD, E. (London, England). Ten skins and an alcoholic specimen of mammal from Central and South America. 24669.
- GOLDEN, R. A. (Washington, D. C.). Specimen of greater snow goose, *Chen hyperborea nivalis* in the flesh. 25459. Two prairie-chickens, *Tympanuchus americanus* in the flesh. 25763.
- HAMLIN, DR. A. C. (Bangor, Me.). Specimen of cut tourmaline from Paris, Me., and 2 cut zircons from Ceylon. 24926.
- HARRISON, Hon. Benjamin (Executive Mansion). Armadillo (*Tatusia novemcincta*), from Breckenridge, Tex., collected by Mr. R. R. Skagg. 24887.
- HASBROUCK, E. M. (Washington, D. C.). Skin of Carolina parakeet, *Cornurus carolinensis* from Florida. 25109.
- HOWELL, E. E. (Washington, D. C.). Three bird skins from Australia, consisting of a lyre-bird, *Menura superba* (female), and male and female specimens of satin bower-bird, *Ptilonorhynchus violaceus*. 25217. Nine specimens of minerals, consisting of scheelite, willemite, tschermigite, hyalite, cryolite, röttisite, evansite, and orpiment. 25262. Minerals from various localities, consisting of manganite, labradorite, calcite, chalcopyrite, pyrite, tourmaline, and jasper. 25263. Two specimens of agalmatolite carving from China. 25467.
- KNOWLTON, W. J. (Boston, Mass.). Ornamental stones. 24545. Four specimens of tourmaline from Siberia and 2 cut specimens of zircon from Ceylon. 24929.
- LAMB, T. F. (Portland, Me.). Ten cut specimens of tourmaline from Auburn, Me., and a cut topaz from Chatham, N. H. 24927.
- MORRISON, Prof. J. H. (Luray, Va.). Cave materials from Luray Caverns. 25517.
- MÜLLER, DR. AUGUST (Berlin, Germany). Skin of owl-monkey, *Nyctipithecus azarae*, skin of cavy (*Diasprocta aguti*), skin of Honduras hare, *Lepus brazilien-sis*. 24780.
- NELSON, E. W. (Bishop Creek, Cal.), through Dr. C. Hart Merriam. Ten skins of mountain sheep from the high desert mountains near Death Valley. 24706.
- PALMER, WILLIAM (U. S. National Museum). Bat (*Vespertilio gryphus lucifugus*) in the flesh. 24571.
- PRATT, Capt. R. H., U. S. A. (Hampton Institute, Hampton, Va.). Collection of ethnological objects obtained from the North American Indians. 25516.
- RICHARDSON, JENNESS (American Museum of Natural History, New York City). Four skins of passenger-pigeon, *Ectopistes migratorius* from Indian Territory. 24849. Eight specimens of Carolina parakeet, *Cornurus carolinensis* from Florida. 24826.
- RUDINGER, LOUIS (D'Hams, Tex.). Little striped skunk, *Spilogale* sp. from Texas. 24570.
- SANSON and MARTIN (Uvalde, Tex.). Civet cat, *Lassauscus astuta*. 25548.

- SCHLÜTER, W. (Halle, Germany). Twelve mammal skins. 24655.
- SCHMID, EDWARD S. (Washington, D. C.). Two peafowls (*Pavo cristatus*) in the flesh. 25759. Seven prairie-chickens, *Tympanuchus americanus* in the flesh. 25762.
- SMITH, WILLIAM G. (Loveland, Colo.). Four mammal skins from Colorado. 25473. Pouched-gopher, *Geomys bursarius*. 25550. Beaver (*Castor canadensis*), prairie-hare, *Lepus campestris*. Rocky Mountain chipmunk, *Tamias quadrivittatus*, little striped skunk, *Spilogale gracilis*. 25555. Striped spermophile, *Spermophilus tridecemlineatus*. 25597. Two dusky grouse, *Dendragapus obscurus*. 25830. White-tailed ptarmigan, *Lagopus leucurus*. 25867.
- SMITHSONIAN INSTITUTION, U. S. National Museum. Volcanic materials from the vicinity of Flagstaff, Ariz., collected by Mr. G. P. Merrill. 25231. Collection of volcanic rocks and stalaetites from Organ Mountain and Bennett Stevenson Mine, New Mexico, collected by Mr. G. P. Merrill. 25384. Life-sized figure of a girl belonging to one of the mountain tribes of northwest Africa, in native costume, obtained by Dr. G. Brown Goode. 25882. Also terra-cotta wreath.
- SOULE, GEORGE (Billings, Mont.). Male rocky-mountain sheep, *Ovis canadensis*. 25298.
- SOUTHWICK & CRITCHLEY (Providence, R. I.). Fox-squirrel, *Sciurus niger niger*, from Florida. 24606. Skin of Peale's egret, *Ardea pealei*, from Andros Island, Bahamas. 24937. Three specimens of North American game birds, representing 3 species. 25833.
- STUART, R. C. (Tampa, Fla.). Mounted ivory-billed woodpecker, *Campephilus principalis* from Florida. 25429.
- TIFFANY & Co. (New York City). Carved amber for the gem exhibit. 25114.
- WARD'S NATURAL SCIENCE ESTABLISHMENT (Rochester, N. Y.). Skin of *Alces machlis*. 24651. Specimen of fluorite from Cumberland, England, and 8 cut specimens of minerals from various localities. 24779.
- WATROUS, B. P. (Washington, D. C.). Four wild turkeys, *Meleagris gallopavo* in the flesh from Virginia. 25026. Purchased. W. C. E.
- WAYNE, ARTHUR T. (Old Town, Fla.). Skin of swallow-tailed kite, *Elanoides forficatus*. 25861.
- WOODWARD, CHARLES L. (New York City). Three cartoons of Indian chiefs painted by George Catlin. 25777. Purchased. W. C. E.
- WORTHEN, CHARLES K. (Warsaw, Ill.). Lynx-skin from Kansas. 25509. Purchased. W. C. E.

## APPENDIX VII.

### BIBLIOGRAPHY OF THE U. S. NATIONAL MUSEUM FOR THE FISCAL YEAR ENDING JUNE 30, 1893.

#### PUBLICATIONS OF THE MUSEUM.

##### ANNUAL REPORT.

Annual Report | of the | Board of Regents | of the | Smithsonian Institution, | showing | the Operations, Expenditures, and Condition | of the Institution | for the | year ending June 30, 1890. | — | Report | of the | National Museum. | — | Washington : | Government Printing Office. | 1891.

8vo., pp. xviii+811. Plates I-CLXIII; figures 1-99.

##### PROCEEDINGS.

Smithsonian Institution. | United States National Museum. | — | Proceedings | of the | United States National Museum. | — | Volume XIV. | 1891. | — | Published under the direction of the Smithsonian Institution. | — | Washington : | Government Printing Office. | 1892.

8vo., pp. vi+750. Plates I-XXXIV; figures 1-3.

The papers in this volume comprise Nos. 842-886, all of which were published separately during the fiscal year ending June 30, 1892.

The dates of publication are given on page vi of the volume.

The papers included between Nos. 889-915, in Volume xv, and between Nos. 919-926 (excepting No. 921), and also an advance edition of No. 944, of Volume XVI, were published separately during the year, and distributed to a limited number of specialists at home and abroad.

##### BULLETIN.

Smithsonian Institution. | United States National Museum. | — | Directions for collecting and | preserving insects. | By | C. V. Riley, M. A., PH. D., | Honorary Curator of the Department of Insects, U. S. National Museum. | — | Part F of Bulletin of the United States National Museum, No. 39 | (with one plate). | — | Washington : | Government Printing Office. | 1892. |

8vo., pp. [1]-[147]. Plate I, figures 1-139.

Smithsonian Institution. | United States National Museum. | — | Instructions for collecting mollusks, | and other useful hints

for | the conchologist. | By | William H. Dall, | Honorary Curator of the Department of Mollusks, U. S. National Museum. | — | Part G of Bulletin of the United States National Museum, No. 39. | — | Washington: | Government Printing Office. | 1892. |

8vo., pp. [1]-[56]. Figures 1-8.

Parts A-E, inclusive, of Bulletin 39, were published during the preceding fiscal year.

Smithsonian Institution, | United States National Museum. | — | Bulletin | of the | United States National Museum. | No. 40. | Bibliographies of American Naturalists: | IV. The published writings of George Newbold Lawrence, 1844-1891. | By | L. S. Foster. | — | Washington: | Government Printing Office. | 1892. |

8vo., pp. xi+124. Frontispiece.

#### SPECIAL BULLETIN.

Smithsonian Institution. | United States National Museum. | Special Bulletin No. 1. | Life Histories | of | North American Birds | with special reference to | their breeding habits and eggs, | with | twelve lithographic plates. | By | Charles Bendire, Captain, U. S. Army (Retired). | Honorary Curator of the Department of Oölogy, U. S. National Museum, | Member of the American Ornithologists' Union. | -- | Washington: | Government Printing Office, | 1892.

4vo., pp. viii+446. Twelve plates.

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PAPERS BY OFFICERS OF THE NATIONAL MUSEUM AND OTHER INVESTIGATORS WHOSE WRITINGS ARE BASED DIRECTLY OR INDIRECTLY ON THE COLLECTIONS OF THE MUSEUM.

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## LIST OF PAPERS.

- ADLER, CYRUS. Report on the Section of Oriental Antiquities in the U. S. National Museum, 1890.  
*Rep. Smithsonian Inst.* (U. S. Nat. Mus.), 1890 (1891), pp. 137-140.
- Note on William B. Hodgson.  
*Proc. Am. Oriental Soc.*, 1892, pp. cex-cex.  
 William B. Hodgson was the earliest American collector of Oriental manuscripts. A portion of his collection is now deposited in the National Museum.
- Christopher Columbus in Oriental literature, with special reference to the *Hudisi Ner* or *Tarikh Hind Gharby*.  
*Proc. Am. Oriental Soc.*, 1892, pp. cex-cexi.  
 The manuscript is accompanied by a unique map of America, and is apparently the first description of the New World in the Turkish language.
- ALLEN, HARRISON. (1) On a new subfamily of Phyllostome bats; (2) description of a new genus of Phyllostome bats; (3) on Temminck's bat (*Scotophilus Temminckii*).  
*Proc. U. S. Nat. Mus.*, xv, Nos. 912-914, October 28, 1892, pp. 437-444.  
 This paper is based upon Museum material.
- Introduction to a monograph of the North American bats.  
*Proc. U. S. Nat. Mus.*, xvi, No. 919, June 13, 1893, pp. 1-28.  
 The monograph from which this paper was extracted is based upon Museum material, and has since been published as Bulletin 43, of the National Museum.
- Notes on the genera of Vespertilionidae.  
*Proc. U. S. Nat. Mus.*, xvi, No. 920, June 13, 1893, pp. 29-31.
- ALLEN, JOEL ASAPH. On a collection of birds from Chapada, Matto Grosso, Brazil, made by Mr. H. H. Smith. Part II, Tyrannidae.  
*Bull. Am. Mus. Nat. Hist.*, iv, No. xviii, December, 1892, pp. 331-350.  
 (Part I, *Ocnis. Ibid.*, iii, No. 2, September 29, 1891, pp. 337-380.)  
 Forty-six species are treated, special attention being given to variation in size and to coloration as affected by seasonal molts, abrasion of the feathers by age, and through general fading of the plumage. The relationships of the widely-dispersed South American *Mynarchus tyrannulus*, to certain closely-allied West Indian, Central American, and Mexican forms, is made the subject of a short resumé, based on a much larger amount of material (over 300 specimens) than had previously been brought together. Critical notes and emendations of a number of species are given and many descriptions of first plumages. This paper is based upon Museum material.
- On a collection of birds from Chapada, Matto Grosso, Brazil, made by Mr. H. H. Smith. Part III, Pipridae to Rheida.  
*Bull. Am. Mus. Nat. Hist.*, v, No. 10, June 1893, pp. 107-128.  
 Seventy-five species are mentioned in this paper, of which one, *Ptygnornis chapadensis*, is described as new. *Metopis galeata* is treated at some length, a series of 127 specimens taken in every month in the year showing in a very thorough manner the different stages of plumage. Other species critically considered are *Synallaxis Azarce*, *Thamnophilus ambiguus*, *Thamnophilus radiatus*, *Dysithamnus mentalis*, *Herpsilochmus longirostris*, *Nyctidromus albicollis Derbyanus*, and *Momotus momota subrufescens*.  
 In regard to the development of the central tail feathers in the last-named species and their denudation by the bird for purposes of personal adornment, some interesting notes are given, showing that in this species, at least, the barbs are forcibly removed by the birds themselves, in an attempt to make the feathers conform to a definite pattern. This paper is based upon Museum material.
- Keeler on the evolution of the colors of North American land birds.  
*Auk*, x, No. 2, April, 1893, pp. 180-195.  
 A critical review of Keeler's work, entitled 'Evolution of the colors of North American Land Birds,' crediting the author with originality and enthusiasm, but charging him with fallacious reasoning and arguing against premature conclusions.
- BAUR, GEORGE. Bemerkungen über verschiedene Arten von Schildkröten.  
*Zoologischer Anzeiger*, 1892, No. 389, pp. 155-159.  
 Remarks upon various species of chelonians, based in part upon material in the National Museum.
- BEAN, BARTON A. The New Hampshire Fish Commission.  
*Forest and Stream*, February 16, 1893, p. 142.  
 A review of the report of the fish and game commissioners for the year ending December 1, 1892.
- BEAN, TARLETON HOFFMAN. Description of a new species of Star-gazer

## BEAN, TARLETON HOFFMAN—continued.

(*Cathetostoma albigutta*) from the Gulf of Mexico.

*Proc. U. S. Nat. Mus.*, xv., No. 896, July 22, 1892, p. 121-122.

— Notes on the fishes collected in Mexico by Prof. A. Dugès, with descriptions of new species.

*Proc. U. S. Nat. Mus.*, xv., No. 903, August 2, 1892, pp. 283-287, pl. XLIV.

— [Ichthyological notes in *Forest and Stream*.] Whitefish and Grayling, August 4, 1892, p. 95, with illustrations. The Rainbow trout, August 11, 1892, p. 119, with illustrations. The Red-throated trout, August 18, 1892, p. 141, with illustrations. The Dolly Varden trout, September 22, 1892, p. 248, with illustrations. The Channel catfish, December 1, 1892, p. 471, with illustrations. California fish culture and protection, December 22, 1892, p. 538, with illustrations. Brook-trout deformities, December 29, 1892, p. 562, with illustrations. The Aquarium at the World's Fair (editorial), February 23, 1893, p. 155. The Lampreys, May 4, 1893, p. 387, with illustrations.

— The Fishes of Pennsylvania.

*Rep. Penna. Fish Com.*, 1889-90-91 (Harrisburg, 1893). Appendix, pp. 1-vii, 1-149, pls. 1-55.

— Report on the Department of Fishes in the U. S. National Museum, 1890.

*Rep. Smithsonian Inst.* (U. S. Nat. Mus.), 1890 (1891), pp. 205-209.

BEECHER, CHARLES E. Revision of the families of loop-bearing Brachiopoda. The development of *Terebratalina obsoleta*, Dall.

*Trans. Conn. Acad. Sci.*, ix., May, 1893, pp. 376-399, pls. 1-111.

The material upon which these important papers were partly based was supplied by the National Museum from dredgings of the steamer *Albatross*.

BENDIRE, CHARLES, Smithsonian Institution. | United States National Museum. | Special Bulletin No. 1. | Life Histories | of | North American Birds | with special reference to | their breeding habits and eggs, | with | twelve lithographic plates. | By | Charles Bendire, Captain, U. S. Army, (Retired), | Honorary Curator of the Department of Oölogy, U. S. National Museum. |

## BENDIRE, CHARLES—continued.

Member of the American Ornithologists' Union. | — | Washington: | Government Printing Office, | 1892. 4to, pp. i-vii, 1-416, pls. 1-XII, containing 185 chromolithographed figures of eggs.

This book discusses of 146 of North American species and subspecies. The main portion of the work is devoted to an exhaustive account of the life histories of the species, mainly from original and recent sources with reference to breeding and migratory ranges, food, and time of incubation, and, finally, the eggs of each species, when known, are carefully described, and in every case the measurements given are the author's own. The average measurements have been obtained with great care from large series of specimens, in some cases being the result of over two hundred separate measurements. The plates accompanying the volume are from drawings by John L. Ridgway.

The following families are treated in the present volume:

Family Tetraonidae, species and subspecies	38
Family Phasianidae, species and subspecies	2
Family Cracidae, subspecies	1
Family Columbidae, species and subspecies	15
Family Cathartidae, species and subspecies	3
Family Falconidae, species and subspecies	51
Family Strigidae, species	1
Family Bubonidae, species and subspecies	35

Published also in the series of Smithsonian Contributions to Knowledge (Vol. xxviii).

— Description of a new Prairie Hen.

*Forest and Stream*, xi., No. 20, May 18, 1893, p. 425.

Brief diagnosis and list of specimens of *Tympanuchus attenuatus*, Bendire (Southern Prairie Hen) from Arkansas County, Texas.

— Report on the Department of Birds' Eggs in the U. S. National Museum, 1890.

*Rep. Smithsonian Inst.* (U. S. Nat. Mus.), 1890 (1891), pp. 199-200.

BENEDICT, JAMES E. Corystoid crabs of the genera *Telmessus* and *Erimacrus*.

*Proc. U. S. Nat. Mus.*, xv., No. 900, August 4, 1892, pp. 223-230, pls. xxv-xxvii.

Three species are described and figured, one of which, *T. isenbeckii*, is placed in a new genus, *Erimacrus*.

BIGELOW, R. P. Preliminary notes on the Stomatopoda of the *Albatross* collections, and on other specimens in the National Museum.

*Johns Hopkins Univ. Circ.*, xii., No. 106, pp. 100-102.

The new species described are *Gonodactylus spinosus*, *G. lavanensis*, *Pseudosquilla megalophthalma*, *Squilla quadridens*, *S. mantoridea*, *S. aculeata*, *S. intermedia*, and *S. rugosa*.



- BLATCHLEY, W. S. On a collection of batrachians and reptiles from Mount Orizaba, Mexico, with descriptions of two new species.  
*Proc. U. S. Nat. Mus.*, XVI, No. 922, June 13, 1893, pp. 37-42.  
This paper is based upon Museum material.
- BOLLES, THOMAS DIX. Chinese relics in Alaska.  
*Proc. U. S. Nat. Mus.*, XV, No. 899, August 4, 1892, p. 221, pl. XXIV.  
This paper is based upon Museum material.
- BOLLMAN, CHARLES HARVEY. A review of the Centrarchidae or freshwater sunfishes of North America.  
*Rep. U. S. Fish Com.*, 1888, pp. 557-579.  
This paper is based upon Museum material.
- CANBY, WILLIAM.  
(See under J. N. ROSE.)
- CARLTON, M. A. Observations on the plants of Oklahoma Territory and adjacent districts.  
*Contrib. U. S. Nat. Herbarium*, 1, December, 1892, pp. 220-232.  
Some general observations upon the flora of Oklahoma and the adjacent region. This paper is based partly on Museum material.
- CLARK, A. HOWARD. Report on the historical collections in the U. S. National Museum, 1890.  
*Rep. Smithsonian Inst. (U. S. Nat. Mus.)*, 1890 (1891), pp. 141-145.
- CLARK JOSEPHINE A. Systematic and alphabetical index of new species of North American phanerogams and pteridophytes published in 1891.  
*Contrib. U. S. Nat. Herbarium*, 1, September, 1892, pp. 151-188.
- CLARKE, FRANK W. Note on the constitution of Ptilolite and Mordenite.  
*Am. Journ. Sci.*, XLIV, August, 1892, pp. 101-102.
- Letter on the name of the element Columbium.  
*Journ. of Analyt. and Appl. Chem.*, VI, October, 1892, p. 582.
- The constitution of the Lithia Miccas.  
*Journ. Am. Chem. Soc.*, XV, No. 5, May, 1893, pp. 245-250.
- Report of work done in the Division of Chemistry and Physics mainly during the fiscal year 1890-'91.  
*Bull. U. S. Geol. Surv.*, No. 90, 1892, pp. 1-77.
- CLARKE, F. W. Report on the Department of Minerals in the U. S. National Museum, 1890.  
*Rep. Smithsonian Inst. (U. S. Nat. Mus.)*, 1890 (1891), pp. 241-242.
- COPE, EDWARD D. A synopsis of the Teiid genus *Cnemidophorus*.  
*Trans. Am. Philosoph. Soc.*, XVII, Pt. 1, pp. 27-52, pls. VI-XIII.  
Based chiefly on Museum material.
- COULTER, JOHN M.  
(See under J. N. ROSE.)
- COVILLE, FREDERICK VERNON. The Panamint Indians of California.  
*Am. Anthropologist*, V, Oct., 1892, pp. 351-361.  
Principally devoted to an account of the native plants used by these Indians.
- The rediscovery of *Juncus Cooperi*.  
*Bull. Torrey Bot. Club*, XIX, October, 1892, pp. 309-311.  
An account of the discovery of this plant in the Death Valley, after a period of more than twenty years since the collection of the type specimen.
- DALL, WILLIAM HEALEY. General notes.  
*Nautilus*, VI, No. 4, August, 1892, p. 48.  
Calls attention to the continuity and conformability of the Wallala and Chico beds at La Jolla, San Diego, Cal., and adds several notes on mollusks.
- Contributions to the Tertiary fauna of Florida, with especial reference to the Miocene silex beds of Tampa and the Pliocene beds of the Caloosahatchie River. Pt. II, Streptodont and other Gastropods, concluded.  
*Trans. Wagner Free Inst. Sci., Phila.*, III, Pt. II, December, 1892, pp. 201-473, pls. XIII-XXII, and a geological map of Florida.  
This second part is prefaced by an introductory note on the marine Pliocene beds of the Carolinas, in which it is shown that true Pliocene strata occur on the Waccamaw River, South Carolina, and the Neuse River, North Carolina, which are respectively named by the author the Waccamaw and the Croatan beds. In the descriptive text which follows the following new genera and species are described and figured: *Eulla attenuata*, *Utriculus vaginatus*, *Drillia myrmecoon*, *D. hoplophorus*, *D. aphanitoma*, and var. *oxia*; *D. schismatica*, *D. sigela*, *Glyphostoma Johnsoni*, *Daphnella clata*, *Cancellaria rotunda*, *C. sericea*, *Marginella eulima*, *M. onchidella*, *Volutella daeria*, *Aurinia dubia* var. *triplicata*, *Caricella podagrina*, *Perplicaria perplexa*, *Fasciolaria acuta* (Emmons), *F. elegans* (Emmons), *Glyptostyla* n. g., *G. panamensis*, *Fusus quinquespinus*, *Celutoco-*

## DALL, WILLIAM HEALEY—continued.

*nus nux*, *Nyanassa schizopyga*, *I. isogramma*, *Nassa Johnsoni*, *Columbella styliola*, *Pteropurpura* (*Jouss. em.*) *subg.*, *Trochopon congnatus*, *Rapana tampaensis*, *Opalia De-Boury*, *Scala Stearnsii*, *Synnola caloosauensis*, *Synnola attenuata*, *Ouidina fragilis*, *Turbonilla* var. *obsoleta*, *T. chipolana*, *T. protracta*, *Cassis* (*Phalium*) *globosum*, *C. Aldrichi*, *Strombus chipolanus*, *Triforis nitella*, *Cerithiopsis floridana*, *C. scariphi*, *Bittium chipolanum*, and var. *Burnsii*, *B. permutable*, *B. Cossmanni*, *B. Annette*, *B. podagrimum*, *B. priseum*, *B. boioplex*, *B. cerithioides*, *B. Adamsi*, *Cerithium caloosauense*, *C. ocalanum*, *C. Burnsii*, *C. platyneura*, *C. floridanum*, *C. callisona*, *C. glyphyrea*, and var. *litharium*, *C. coccodes*, *C. chipolanum*, *Potamides hillsboroensis* (*Hp.*), *P. transecta*, *P. acutus*, *Clara chipolana*, *C. caloosauensis*, *Ataba chipolana*, *Modulus Wilcoxii*, *M. compactus*, *Cæcum compactum*, *C. coronellum*, *C. carolinianum*, *C. tortile*, *C. ibex*, *Meioceras cingulatum*, *Serpulorbis tenera*, *S. ballista*, *Turritella maritimensis*, *T. mixta*, *T. tripartita*, *T. megalobasis*, *T. terebriformis*, *T. chipolana*, *T. Holmesii*, *T. subgrundifera*, *T. var. tensa*, *Tuba acutissima*; *Solarium* new sections, *Solariaxix*, *Patularis*, *Stellaxis*, *Solarium*; *Solarium Cossmanni*, *S. alabamense*, *S. prisciclidum*, *S. Aldrichi*, *S. Leanum*, *S. vicksburgense*, *S. newtonense*, *S. amphitermum*, *S. Johnsoni*, *S. textilinum*; *Discohelix* new section *Discosolis*; *D. retifera*, *Hydrobia amnicoloides* (*Pilsbry*), *H. umblicata* (*Pilsbry*), *H. mobiliana* *Dall*, *Gnathodon Johnsoni*, *Ammicola* var. *convexa* (*Pillsbry*), *A. onphalotropis* (*Pilsbry*); *Rissoa lipes* *Dall*, *R. athymorhysa*, *R. geræa* and var. *minor*, *R. callistrophia*, *R. microcharia*; *Rissoina Johnsoni*, *R. chipolana*, *Adeorbis strigillatus*, *A. Holmesii*, *A. Leai*, *Crucibulum* var. *chipolanum*, *Amalthea Wilcoxii*, *Xenophora textilina*, *X. lapiferens* (*Whitfield*), *X. conica* *Dall*, *Natica alticallosa*, *N. floridana*, *Polynices internus* (*Say*) *P. rugifera*, *Ampullina Fischeri*, *A. solidula*, *Amaropsis Burnsii*, *Sigaretus chipolanus*, *S. multiplicatus*, *S. Conradii*, *S. carolinensis*, *Turbo rhectogrammicus*, *Astralium chipolanum*, *A. precursor*, *Collonia elegantula*, *C. radiata*, *C. chipolana*, *C. claibornensis*, *Chlorostoma lima-tum*, *Gibbula americana*, *Calliostoma eliminatum*, *C. basicum*, *C. Conradianum*, *C. metrium*, *C. Wilcoxianum*, *C. pernagnum*, *C. aluminium*, *C. grammaticum*, *C. exile*, *C. Wagneri*, *C. aphelium*, *C. erosum*, *C. Harrisii*, *C. cycus*, *C. limbulum*, *C. cerramicum*, *Margarita tampaensis*, *Solarilla louisiana*, *S. turritella*, *Liotia coronata*, *L. milium*, *L. perrarnata*, *L. agnea*, *Teinostoma milium*, *F. caloosauense*, *T. chipolanum*, *T. opisthotus*, *F. microforatis*, *T. sciratum*, *T. vortex*, *T. collinus*, *T. funiculus*, *T. pseud-alcorbis*, *Cochliolepis striata* (*Stimpson Ms.*), *Cyclostrema chipolanum*, *Molleria duplinensis*, *M. minuscula*; *Nerita tampaensis*, *Neritina chipolana*, *N. edentula*, *Fissuridea nucula*, *F. chipolana*, *F. caloosauensis*, *F. cardittella*, *Emerginula caroliniana*, *E. Pilsbryi*, *Vaginella chipo-*

## DALL, WILLIAM HEALEY—continued.

*lana*, *Trachyodon*, n. subg., *T. eocenensis* (*Conr.*), *Ischnochiton tampaensis*, *Dentalium Eugeni*, *D. oleacinum*, *D. caloosauense*, *D. prismata*, *D. caduloide*, *Cadulus floridanus*, *C. Burnsii*.

— Note on *Cytherca convexa*, Say.

*Nautilus*, vi, No. 5, September, 1892, pp. 52-53.

This indicates the place of publication of Brongniat's prior species of the same name, and concludes that Conrad's name of *C. Sayana* for the American shell should be adopted.

## — Grand Gulf formation.

*Science*, xx, No. 502, September 16, 1892, p. 164, and No. 513, December 2, 1892, p. 319.

These letters discuss the place and extent of the Grand Gulf formation of Hilgard in the geology of the Gulf States.

## — Determination of the dates of publication of Conrad's "Fossils of the Tertiary Formation" and "Medial Tertiary."

*Bull. Philosoph. Soc. Wash.*, xii, January, 1893, pp. 215-240.

In this paper the history and dates of publication of the two works referred to are discussed, and many hitherto doubtful points of nomenclature conclusively settled.

## — Additional shells from the coast of southern Brazil.

*Nautilus*, vi, No. 10, February, 1893, pp. 109-112.

This article enumerates shells received from Dr. von Ihering and other collectors on the east coast of South America.

## — Report on the Department of Mollusks in the U. S. National Museum, 1890.

*Rep. Smithsonian Inst. (U. S. Nat. Mus.)*, 1890 (1891), pp. 211-217.

(See also under Mrs. M. BURTON WILLIAMSON.)

## DALL, WILLIAM HEALEY, and HARRIS, GILBERT DENNISON. U. S. Geological Survey correlation papers. Neocene.

*Bull. U. S. Geol. Surv.*, No. 84, Washington, Government Printing Office, 1892, pp. 1-349, 43 cuts, and 3 geological maps.

This work summarizes our knowledge (to 1890) of the Post Eocene Tertiary of the United States, and contains a good deal of new material relative to Alaska and Florida, and an account of an hitherto unrecognized division of the Miocene in the Tertiary of the Gulf States. It forms one of a series of essays covering the Geology of the United States, prepared for the International Geological Congress of August, 1891, at Washington, by members of the U. S. Geological Survey.

DEWEY, LYSTER H. The Russian thistle and other troublesome weeds in the wheat region of Minnesota and North and South Dakota.

*Farmer's Bull. No. 10, U. S. Dept. Agric., 1893, pp. 1-16.*

Popular account of the introduction of the Russian thistle into this country, and some suggestions as to the best means of exterminating it. Based on National Herbarium.

EATON, DANIEL CADY. List of ferns from southern Patagonia.

*Contrib. U. S. Nat. Herbarium, 1, September, 1892, p. 138.*

A list of the ferns collected by the U. S. Fish Commission Steamer *Albatross*, and now in the National Museum.

— List of mosses from Fuegia and Patagonia.

*Contrib. U. S. Nat. Herbarium, 1, September, 1892, pp. 138-139.*

Important notes on mosses collected by the U. S. Fish Commission Steamer *Albatross*, and now in the National Museum.

ECKFELDT, J. W. List of lichens from southern Patagonia.

*Contrib. U. S. Nat. Herbarium, 1, September, 1892, p. 142.*

A list of the lichens collected by the U. S. Fish Commission Steamer *Albatross*, and now in the National Museum.

EIGENMANN, CARL H. The Fishes of San Diego.

*Proc. U. S. Nat. Mus., xv, No. 897, August 4, 1892, pp. 123-178, pls. x-xviii.*

This paper is based upon Museum material.

— Catalogue of the fresh-water fishes of Central America and southern Mexico.

\* *Proc. U. S. Nat. Mus., xvi, No. 925, June 13, 1893, pp. 53-60.*

ELLIOTT, DANIEL GIRAUD. Vieillot's "Analyse" and Buffon's "Breve."

*Auk, x, No. 2, April, 1893, pp. 184-188.*

Replying to Dr. Stejneger, in which, while agreeing with him in regard to the proper names to be borne by the *Pittas*, contends that the evidence in regard to the other question as to the priority of the first four volumes of the "Nouveau Dictionnaire" tends directly against it and more strongly to confirm our belief that the "Analyse" was a prior publication.

— On the genus *Pitta*, Vieillot.

*Auk, x, No. 1, January, 1893, pp. 51-52.*

Shows that *Pitta* of Vieillot is a composite genus containing three short-tailed species. Therefore, if they are to be divided into separate genera, we should have *Anthocinclia* with

ELLIOTT, D. G.—continued.

*A. Phayrei* as its type, *Pitta* with *P. sordida* for its type, comprising all the birds with very short, slightly rounded rectrices, and *Eucicla* with *P. guaiana* as its type, including the species with rather elongated, pointed tails; sufficient not being known at present to establish the relationships of *Coraopitta*.

EVANS, A. W. List of liverworts from southern Patagonia.

*Contrib. U. S. Nat. Herbarium, 1, September, 1892, pp. 140-142.*

Two new species are here described and figured. This paper is based upon Museum material.

EVERMANN, BARTON W. Report on the establishment of fish-cultural stations in the Rocky Mountain region and the Gulf States, consisting of (1) A reconnaissance of the streams and lakes of western Montana and northwestern Wyoming, and (2) A report upon investigations made in Texas in 1891.

*Senate Mis. Doc. No. 65, Fifty-second Congress, first session, pp. 1-86, and Bull. U. S. Fish Com., 1891, pp. 1-90.*

— Description of a new sucker, *Pantosteus Jordani*, from the Upper Missouri Basin.

*Bull. U. S. Fish Com., 1892, pp. 31-56.*

This paper is based upon Museum material.

FERNOW, BERNHARD EDUARD. Report on the Section of Forestry in the U. S. National Museum, 1890.

*Rep. Smithsonian Inst. (U. S. Nat. Mus.), 1890 (1891), pp. 163-164.*

FISHER, E. M. Revision of North American species of *Hoffmanseggia*.

*Contrib. U. S. Nat. Herbarium, 1, September, 1892, pp. 143-150.*

All the North American species of *Hoffmanseggia* are described. This paper is based partly upon Museum material.

FLINT, JAMES MONROE. Report on the Section of Materia Medica in the U. S. National Museum, 1890.

*Rep. Smithsonian Inst. (U. S. Nat. Mus.), 1890 (1891), pp. 175-177.*

GOËS, AXEL. Reports on the dredging operations off the west coast of Central America to the Galapagos, to the west coast of Mexico, and in the Gulf of California, in charge of Alexander Agassiz, carried on by the U. S. Fish Commission Steamer *Albatross* during

GOËSS, AXEL.—continued.

1891. Lient. Commander Z. L. Tanner, U. S. Navy, commanding. III. On a peculiar type of arenaceous Foraminifer from the American tropical Pacific, *Neusina Agassizi*.

*Bull. Mus. Comp. Zool.*, XXIII, No. 5, December, 1892, pp. 195-198, pl. 1.

This paper is based upon Museum material.

GOODE, GEORGE BROWN. Report upon the condition and progress of the U. S. National Museum during the year ending June 30, 1890.

*Rep. Smithsonian Inst.* (U. S. Nat. Mus.), 1890 (1891), pp. 1-116.

HARRIS, GILBERT DENNISON. The Tertiary geology of Calvert Cliffs, Maryland.

*Am. Journ. Sci.*, XIV, January, 1893, pp. 21-31, one map in the text.

In this article the author correlates the faunal zones in the Miocene of the region, showing that there are at least three fairly distinct faunas represented, in ascending order, by the Plum Point, Jones' Wharf, and St. Mary's horizons. These facts had hitherto been ignored, confused, or their significance unrecognized. The material by which these conclusions are justified now forms part of the national collection.

— Notes on Conrad's "Fossil Shells of the Tertiary Formation."

*Am. Geologist*, XI, No. 4, April, 1893, pp. 279-281.

Refers to the dates of some of Conrad's publications.

— Republication of Conrad's "Fossil Shells of the Tertiary Formation of North America."

8vo., pp. 1-121, 20 plates and 1 map. Washington, May, 1893.

This is as nearly as possible an exact reprint of Conrad's Eocene volume, with an Albertype reproduction of the original plates, and of two unpublished plates, together with an introduction and index by the author. The work being practically inaccessible and very necessary for students of the American Eocene, was reprinted under Mr. Harris's editorship.

(See also under WILLIAM HEALEY DALL.)

HASBROUCK, EDWIN M. A presumably new fact relative to the Cedar Wax-wing (*Ampelis cedrorum*), with remarks upon the importance of a thorough knowledge of first plumages.

*Science*, XXI, No. 528, March 17, 1893, pp. 144-145.

HASBROUCK, EDWIN M.—continued.

Proves that the sealing-wax-like appendages to shafts of secondaries are, to some extent, at least, independent of age. This paper is based upon Museum material.

HAUPT, PAUL. On a modern reproduction of the eleventh tablet of the Babylonian Nimrod Epic and a new fragment of the Chaldean account of the Deluge.

*Proc. Am. Oriental Soc.*, 1893, pp. ix-xii.

HAY, OLIVER PERRY. On the ejection of blood from the eyes of horned toads.

*Proc. U. S. Nat. Mus.*, XV, No. 907, September 16, 1892, pp. 375-378.

The curious phenomenon recorded took place in the herpetological laboratory of the Museum.

— Some observations on the turtles of the genus *Malaclemys*.

*Proc. U. S. Nat. Mus.*, XV, No. 908, September 16, 1892, pp. 379-383.

Critical notes, chiefly on Museum material.

— On the breeding habits, eggs, and young of certain snakes.

*Proc. U. S. Nat. Mus.*, XV, No. 909, September 16, 1892, pp. 385-397.

The entire collection upon which these notes were based was donated to the Museum by the author.

— The | Batrachians and Reptiles | of the | State of Indiana. | By Oliver Perry Hay, Ph. D. | Indianapolis: | B. Burford, Printer and Binder | 1893.

8vo., pp. 1-204, pls. 1-111.

Based in part upon material belonging to the National Museum.

HITCHCOCK, ROMYN. The ancient pit-dwellers of Yezo, Japan.

*Rep. Smithsonian Inst.* (U. S. Nat. Mus.), 1890 (1891), pp. 417-427, pls. LXXIII-LXXX, figs. 64-67.

— The Ainos of Yezo, Japan.

*Rep. Smithsonian Inst.* (U. S. Nat. Mus.), 1890 (1891), pp. 429-502, pls. LXXXI-CXVII, figs. 68-88.

— Report on the Sections of Foods and Textiles in the U. S. National Museum, 1890.

*Rep. Smithsonian Inst.* (U. S. Nat. Mus.), 1890 (1891), pp. 165-174.

HOLM, THEODOR. Notes on the flowers of *Anthoxanthum odoratum* L.

*Proc. U. S. Nat. Mus.*, XV, No. 910, October 3, 1892, pp. 399-403, pl. XLVIII.

This paper is based upon Museum material.

HOLMES, WILLIAM HENRY. Gravel man and paleolithic culture.

*Science*, XXI, No. 520, January 20, 1893, pp. 29-30.

— Distribution of stone implements in the tide-water country.

*Am. Anthropologist*, VI, No. 1, January, 1893, pp. 1-14, pls. 1-11, figs. 1-2.

— Are there traces of man in the Trenton Gravels?

*Journ. Geol.*, I, No. 1, January-February, 1893, pp. 15-37, figs. 1-6.

— Traces of glacial man in Ohio.

*Journ. Geol.*, I, No. 2, February-March, 1893, pp. 147-163, pl. II, figs. 1-2.

— Vestiges of early man in Minnesota.

*Am. Geologist*, XI, No. 4, April, 1893, pp. 219-240, figs. 1-7.

— Report on the Department of American Prehistoric Pottery in the U. S. National Museum, 1890.

*Rep. Smithsonian Inst.* (U. S. Nat. Mus.), 1890 (1891), pp. 135-136.

HOLZINGER, JOHN M. On *Amaranthus crassipes*.

*Botan. Gaz.*, XVII, August, 1892, pp. 254-256, pl. 1.

*A. crassipes* is shown to be distinct from *A. polygonoides*.

— List of plants collected by C. S. Shelton and M. A. Carlton in the Indian Territory in 1891.

*Contrib. U. S. Nat. Herbarium*, I, December, 1892, pp. 189-219.

Two new species are described and figured.

This paper is based upon Museum material.

— *Polygonum persicarioides*, H. B. K.

*Botan. Gaz.*, XVII, September, 1892, pp. 295-296.

The discovery of *Polygonum persicarioides* in the United States is recorded. This paper is based upon Museum material.

— The systematic position of *Entosthodon Bolanderi*.

*Botan. Gaz.*, XVII, November, 1892, pp. 380-381.

Reasons are given why *Entosthodon Bolanderi* should be referred to *Fanaria*. This paper is based upon Museum material.

HOUGH, WALTER. Rare forms of polished stone implements and their probable use.

*Science*, XXI, January 6, 1893, p. 5.

Describes certain prehistoric grooved stones of unknown use, measuring about 3 by 2½ inches, found in Mexico and southward, corre-

HOUGH, WALTER—continued.

lates them with the Polynesian bark mallets, and suggests their probable use for beating out paper and cloth from bark. Corroborated by Dr. D. G. Brinton in *Science*, March 19, 1893.

— Balances of the Peruvians and Mexicans.

*Science*, XXI, January 20, 1893, p. 30.

Describes balances and balance-beams from the huacos of Peru, in the Royal Archaeological Museum in Madrid, and stone weights in the Mexican collection at the Columbian Historical Exposition in Madrid.

— The Bernadon, Allen, and Jony Korean collections in the U. S. National Museum.

*Rep. Smithsonian Inst.* (U. S. Nat. Mus.) 1891 (1893), pp. 429-488, pl. XXX.

A study based upon the large Korean collection in the U. S. National Museum, and information gathered from native Koreans and travelers through a period of six years.

— Time-keeping by light and fire.

*Am. Anthropologist*, IV, No. 2, April, 1893, p. 207.

Presentation of unnoticed methods of reckoning time by combustible materials.

— The methods of fire-making.

*Rep. Smithsonian Inst.* (U. S. Nat. Mus.), 1890 (1891), pp. 395-409, pl. LI, figs. 51-63.

HOWARD, LELAND O. A new *Icerya* parasite.

*Insect Life*, IV, Nos. 11-12, August, 1892, pp. 378-379.

Description of *Cerchysius icerya*, n. s., reared at Kingston, Jamaica, by T. D. A. Cockerell from *Icerya rosea*, R. & H. This paper is based upon Museum material.

— An experiment against mosquitoes. (Read before the Association of Economic Entomologists at Rochester, N. Y., August 16, 1892.)

*Insect Life*, V, No. 1, September, 1892, pp. 12-13.

Four ounces of coal oil destroyed an estimated number of 7,400 insects (of which 370 were female mosquitoes) in a pool of water contained in 60 square feet of surface, and kept the pool free from living insects of all kinds for ten days.

— A new enemy to timothy grass. (Read before the Association of Economic Entomologists at Rochester, N. Y., August, 1892.)

*Insect Life*, V, No. 2, November, 1892, pp. 90-92, figs. 8, 9.

This species, *Oncognathus binotatus*, family *Capsidae*, was found on Onteora Mountain, New York, and only at an elevation of 2,500 feet. It

## HOWARD, LELAND O.—continued.

was observed in extraordinary numbers in the heads of the timothy, engaged in sucking the juices of the plant. This paper is based upon Museum material.

## — The Hymenopterous parasites of spiders.

*Proc. Ent. Soc. Wash.*, II, No. 3, December, 1892, pp. 290-302, pl. II.

Twenty-four American Hymenopterous parasites of spiders are recorded and twelve new species are described. List of fifty-eight European Hymenopterous species parasitic upon spiders. This paper is based upon Museum material.

## — Note on the hibernation of Carpenter Bees.

*Proc. Ent. Soc. Wash.*, II, No. 3, December, 1892, p. 331.

The author's abstract of a paper recording the finding of a living male of *Xylocopa virginica* in a burrow of a pine branch in March, showing that the male of the species, as well as the impregnated female, hibernates. This paper is based upon Museum material.

## — A note on the parasites of the Coccida.

*Proc. Ent. Soc. Wash.*, II, No. 3, December, 1892, pp. 351-352.

Contents that Aurivillius's generalization in *Entomologisk Tidskrift*, IX, Nos. 3-4, 1888, to the effect that Pteromalid parasites of the Coccids belonging to the *Encyrtene* and *Aphelinine* do not, when infesting female Coccids, kill their host or diminish the number of eggs laid by her, will not hold. In the majority of cases in his experience the females are pierced by their parasites at all stages of growth, and when thus pierced growth is arrested. This paper is based upon Museum material.

— The "Fly Weevil" (*Gelechia cercal-ella*). (An address before the Farmers' Institute of the Seventh Congressional District of Virginia, at Manassas, Va., February 22, 1893.)

*Bull. Dept. Agric., Virginia*, May, 1893, pp. 12-16.

The early history and literature of the species are discussed and its life history briefly treated. Early thrashing is recommended in the case of wheat, but where the wheat must be left in the field the individual farmer should disinfect his granaries every year soon after the wheat is put in. This is best done with bisulphide of carbon, and the author gives the proper quantities to be used in rooms of various sizes. Against this insect as a corn pest the practice has been adopted of growing only such varieties of corn as have a close-fitting husk

## HOWARD, LELAND O.—continued.

(thus preventing the insects from laying their eggs upon the corn in the field), and of storing in cribs without removing the husk.

## — Insects affecting the Musk-melon.

*Am. Gardening*, XIV, No. 4, April, 1893, pp. 209-216, 1 figure.

Discusses and suggests remedies for the melon worm (*Phakellura hyalinitalis*), the so-called pickle worm (*P. nitidalis*), the squash stem-borer (*Melittia ceto*), the melon-plant louse (*Aphis citrulli*), the cucumber-leaf beetle (*Epitrix cucumeris*), the 12-spotted and striped diabrotics (*Diabrotica 12-punctata* and *D. vittata*), of the so-called pumpkin beetle (*Epilachna borealis*), and the squash-bug (*Anasa tristis*).

## — Insects of the subfamily Encyrtinae with branched antennae.

*Proc. U. S. Nat. Mus.*, XV, No. 905, September 16, 1892, pp. 361-369, pls. XLVI-XLVII.

This paper is based upon Museum material.

(See also under CHARLES V. RILEY.)

JORDAN, DAVID STARR. *Salmo kalooops*.

*Forest and Stream*, XXXIX, No. 7, November 10, 1892, p. 405.

This paper is based in part upon Museum material.

## KEELER, CHARLES A. Evolution of the colors of North American Land Birds.

*Occasional Papers Cal. Acad. Sci.* III, San Francisco, January, 1893, pp. 1-XII, 1-361, pl. I-XIX.

An important and highly original treatise, based to a large extent on the material of the U. S. National Museum. The work consists of two parts, and treats first of general questions: I. Introduction. The inheritance of acquired characters (pp. 2-50), Variation and natural selection (pp. 50-63), Laws conditioning evolution (pp. 64-80), Sexual selection (pp. 80-102). The nature of species (pp. 103-109), and isolation as a factor in the evolution of species (pp. 110-132). Part II is devoted to "The colors of North American Birds" (pp. 132-336), followed by a bibliography, explanations of plates, and an index.

## KIRSCH, PHILIP H. Notes on the streams and rivers of Clinton County, Ky., with a description of a new darter.

*Bull. U. S. Fish Com.*, 1890, pp. 289-292.

This paper is based upon Museum material.

## — Notes on a collection of fishes from the southern tributaries of the Cumberland River in Kentucky and Tennessee.

*Bull. U. S. Fish Com.*, 1891, pp. 259-263.

This paper is based upon Museum material.

KNOWLTON, FRANK HALL. Fossil flora of the Bozeman coal field.

*Proc. Biol. Soc. Wash.*, VII, pp. 153-154.

Gives a short summary of the flora of this locality and draws conclusions as to the age of the beds.

— Flora of the Dakota group. A post-humous work by Leo Lesquereux. Edited by F. H. Knowlton.

*Monogr. U. S. Geol. Surv.*, XVII, pp. 1-400, pls. I-LXVI.

Gives a complete description of the flora of this group. It embraces 460 species, of which number about one-fourth are new to science.

— Letter to I. C. Russell on fossil wood from the Triassic of North Carolina and review of the Triassic plants of Prince Edward Island.

*Bull. U. S. Geol. Surv.*, No. 85, p. 29.

— Report on Inter-glacial earth from Iowa, in W. J. McGee's "Geology of Southwestern Iowa."

*11 Ann. Rep. U. S. Geol. Surv.*, p. 493.

— Bread-fruit trees in North America.

*Science*, XXI, p. 24.

Describes two species of bread-fruit trees, *Artocarpus Lessingiana* (the *Aralia pungens* and *Myrica Lessingii* of Lesquereux), from the Laramie of Colorado, and *A. californica*, a new species from the auriferous gravels of California.

— The flora of the Dakota Group: A reply.

*Botan. Gaz.*, XVIII, pp. 37-39.

A reply to a criticism of the editorial work on this monograph.

— Description of a new fossil species of *Chara*.

*Botan. Gaz.*, XVIII, pp. 141-142, figs. 1-3.

Describes a new species (*Chara Stantonii*) from the Bear River formation at Cookville, Wyo.

— A simple point in nomenclature.

*Bull. Torrey Botan. Club*, XX, pp. 212-213.

Raises the question as to where the interrogation mark should be placed when it is desired to question either of the members of a plant name.

— Note on a supposed new endogenous tree from the Carboniferous.

*Science*, XXI, pp. 332-333.

Criticises the supposed finding of an endogenous tree (*Winchellina fasciata*) in the Carboniferous of Ohio, showing that it is a fern-stem of a well-known type (*Psaronius*).

KNOWLTON, FRANK HALL. [Review of] Cretaceous fossil plants from Minnesota. By Leo Lesquereux.

*Journ. Geol.*, I, pp. 302-303.

— [Review of] On the organization of the fossil plants of the coal-measures. By W. C. Williamson.

*Journ. Geol.*, I, p. 303.

KOEHLER, SYLVESTER ROSA. The photo-mechanical processes.

*Technology Quarterly*, V, No. 3, Boston, October, 1892, pp. 161-204.

A series of papers on the processes named, read before the Society of Arts, at the Massachusetts Institute of Technology, Boston.

— Peter Lymen von Antwerpen (oder Brussel?).

*Kunstchronik*, Leipzig, June 30, 1892, cols. 523-524.

Concerning the identity of the portrait of Peter Lymen, by Van Dyck, owned by Mr. Francis Bartlett, Boston.

— John Webber und die Erfindung der Lithographie.

*Kunstchronik*, Leipzig, December 1, 1892, cols. 102-103.

Description of a print in the John Witt Randall collection, Harvard College, showing that the so-called lithographs by John Webber are soft-ground etchings.

— Der Tiefstich auf Holz.

*Zeitschrift für bildende Kunst*. New series, IV, No. 6, illustrated. Leipzig, March, 1893.

On the invention and practice of intaglio engraving on wood.

— White-line engraving for relief printing in the fifteenth and sixteenth centuries.

*Rep. Smithsonian Inst. (U. S. Nat. Mus.)*, 1890 (1891), pp. 385-394, pls. XLVII-L, figs. 48-50.

— Report on the Section of Graphic Arts in the U. S. National Museum, 1890.

*Rep. Smithsonian Inst. U. S. Nat. Mus.*, 1890 (1891), pp. 147-157.

LINDGREN, WALDEMAR. A sodalite syenite and other rocks from Montana.

*Am. Journ. Sci.*, XLV, April, 1893, pp. 286-297.

Describes a peculiar series of rocks. The more striking among them are the syenites which were collected in the Moccasin and Bear Paw mountains during the summer of 1883 by Dr. C. A. White and J. B. Marcou, and which have been deposited in the U. S. National Museum.

LINTON, EDWIN. Notes on avian Entozoa.

*Proc. U. S. Nat. Mus.*, xv, No. 893, August 8, 1892, pp. 87-113, pls. IV-VIII.

This paper is based upon Museum material.

LUCAS, FREDERIC AUGUSTUS. On the anatomical characters of Humming Birds.

*Rep. Smithsonian Inst. (U. S. Nat. Mus.)* 1890 (1892), pp. 290-294, pl. xv, figs. 1-4.

Published in the paper on Humming Birds by Robert Ridgway.

— On *Carcharodon Mortonii* Gibbs.

*Proc. Biol. Soc. Wash.*, vii, July 27, 1892, pp. 151-152.

Notes that the species is probably founded on an abnormal tooth.

— A welcome correction.

*St. Nicholas*, October, 1892, p. 958.

Correcting an error in an article on snakes, and giving some details regarding their anatomy.

— A neglected branch of Ornithology.

*Auk*, x, April, 1893, p. 210.

A letter indicating some reasons why the study of the anatomy of birds is neglected.

— Articles on Alektorides, Anseres, Apteryx, Apteryges, Auk, Auroids.

*Johnson's Universal Cyclopædia*, i, pp. 107, 226, 264, 411, 413.

LUDWIG, HUBERT. Vorläufiger Bericht über die auf den Tiefsee-Fahrten des *Albatross* (Frühling, 1891), im östlichen Stillen Ocean erbeuteten Holothurien.

*Zoologischer Anzeiger*, No. 420, 1893, pp. 1-10.

— Reports on the dredging operations off the west coast of Central America to the Galapagos, to the west coast of Mexico, and to the Gulf of California, in charge of Alexander Agassiz, carried on by the U. S. Fish Commission Steamer *Albatross* during 1891, Lieut. Commander Z. L. Tanner, U. S. Navy, commanding. IV. Vorläufiger Bericht über die erbeuteten Holothurien.

*Bull. Mus. Comp. Zool.*, xxiv, No. 4, June, 1893, pp. 105-114.

Preliminary descriptions are given of 1 new family, Pelagothuriidae; 8 new genera, *Synallaetes*, *Mesites*, *Meseres*, *Scotodeima*, *Lætmoplasma*, *Capheira*, *Pelagothuria*, and *Sphærothuria*; 30 new species, *Palopatides suspecta*, *Synallaetes alexandri*, *S. enigma*, *Mesites multiples*, *Meseres Macdonaldi*, *Euphronides Tanneri*, *E. verrucosa*, *Psychropotes varipes*, *P. dubiosa*, *Benthodytes incerta*, *Deinua pacificum*, *Onciophanta affinis*, *Lætmogone Theeli*, *Scotodeima*

LUDWIG, HUBERT—continued.

*setigerum*, *Lætmoplasma fecundum*, *Capheira sulcata*, *Peniagone intermedia*, *Scotoanassa gracilis*, *Pelagothuri natatrix*, *Phyllophorus aculeatus*, *Psolus pauper*, *P. digitatus*, *P. diomedæ*, *Psolidium panamense*, *P. gracile*, *Sphærothuria bitentaclata*, *Caudina californica*, *Trochostoma granulatum*, *T. intermedium*, *Ankyroderma spinosum*; and 3 varieties, *Pannychia Moseleyi* var. *Henrici*, *Peniagone vitrea* var. *setosa*, and *Synapta abyssicola* var. *pacifica*. This paper is based upon Museum material.

MARSH, OTINIEL CHARLES. Notes on Mesozoic vertebrate fossils.

*Am. Journ. Sci.*, XLIV, August, 1892, pp. 171-176, pls. II-IV.

— Restorations of *Claosaurus* and *Ceratosauros*. Restoration of *Mastodon americanus*.

*Am. Journ. Sci.*, XLIV, October, 1892, pp. 343-350, pls. VI-VIII.

— A new Cretaceous bird allied to *Hesperornis*. The skull and brain of *Claosaurus*.

*Am. Journ. Sci.*, XLV, January, 1893, pp. 81-86, pls. IV, V.

— Restoration of *Anchisaurus*.

*Am. Journ. Sci.*, XLV, February, 1893, pp. 169-170, pl. VI.

MASON, OTIS TUFTON. The Eskimo throwing-stick.

*Science*, XIX, New York, 1892, p. 322.

Calls attention to discoveries of new areas and gives a bibliography of recent papers on the subject.

— The land problem.

*Brooklyn Ethical Association. Evolution Series*, No. 22, New York 1892, pp. 109-145.

An address before the Brooklyn Ethical Association, in which the history of land-owning and land-treatment are traced among primitive races of men, and the effects of each method pointed out.

— Report on the Department of Ethnology, in the U. S. National Museum, 1890.

*Rep. Smithsonian Inst. (U. S. Nat. Mus.)*, 1890 (1891), pp. 119-134.

MATTHEWS, WASHINGTON. The Catlin collection of Indian paintings.

*Rep. Smithsonian Inst. (U. S. Nat. Mus.)*, 1890 (1891), pp. 593-610, pls. CXXX-CL.

This paper is based upon Museum material.

MEARNS, EDGAR A. A study of the Sparrow Hawks (Subgenus *Tinnunculus*) of America, with especial refer-



MEARNS, EDGAR A.—continued.

ence to the continental species (*Falco sparverius* Linn.).

*Auk*, ix, No. 2, July, 1892, pp. 252-270.

A critical discussion of the geographical races and incipient forms of the single continental species, with a synopsis. New subspecies described: *Falco sparverius deserticolus*. Mearns (p. 263), habitat, southwestern United States, north to northern California and western Montana, south to Mazatlan, in northern Mexico. *Falco sparverius peninsularis*. Mearns (p. 267); habitat, Lower California. *Falco sparverius æquatorialis*. Mearns (p. 269); habitat, Ecuador. This paper is based chiefly on Museum material.

MEEK, SETH E. A report upon the fishes of Iowa, based upon observations and collections made during 1889, 1890, and 1891.

*Bull. U. S. Fish Com.*, 1890, pp. 217-248.

MERRILL, GEORGE PERKINS. Handbook of the Department of Geology in the U. S. National Museum. Part I, Geognosy: The materials of the earth's crust.

*Rep. Smithsonian Inst.* (U. S. Nat. Mus.), 1890 (1891), pp. 503-591, pls. cxviii-cxxix, 10 figures in the text.

This forms the fourth of the series of handbooks relating to the Department thus far issued and deals, as its title denotes, with the materials of the earth's crust in the least-changed conditions.

— Discussion of the strength and weathering qualities of roofing slate.

*Trans. Am. Soc. Civil Engineers*, xxvii, December, 1892, pp. 685-687.

A discussion of Prof. Merriam's paper on the strength and weathering qualities of roofing slates, which appeared in the same volume, p. 33.

— The architect and his materials.

*Am. Architect and Building News*, March 4, 1893, p. 134.

An article calling attention to what the writer believes to be a serious defect in architectural methods—that relating to the selection of materials.

— A cheap form of box for microscopic slides.

*Science*, November 25, 1892, p. 298.

Describes briefly a new form of box now in use in the National Museum.

— A new source of Mexican onyx.

*Science*, April 21, 1893, p. 221.

A brief note regarding a newly discovered deposit of the so-called onyx in Lower California.

— A peculiar occurrence of beeswax.

*Science*, June 16, 1893, p. 331.

MERRILL, GEORGE P.—continued.

A brief note calling attention to deposits of supposed beeswax in the sands of the seashore near Portland, Oreg.

— The building-stone industry of the United States.

*Stone*, July, 1892, pp. 131-139, pls. 2; August, 1892, pp. 263-268, pls. 2, 1 figure in the text; September, 1892, pp. 369-374, pls. 3, 2 figures in the text.

— [Brief papers in *Stone*]. The marble region of Knoxville, Tenn., November, 1892, pp. 591-599, 1 map and 5 figures in the text. Remarks on prevalent methods of testing building stone, December, 1892, pp. 5-8. The strength and weathering qualities of roofing slates, January, 1893, pp. 135-139. The onyx deposits of Cave Creek, Ariz., February, 1893, pp. 204-205.

— Report on the Department of Geology in the U. S. National Museum, 1890.

*Rep. Smithsonian Inst.* (U. S. Nat. Mus.), 1890 (1891), pp. 243-249.

MERRILL, GEORGE P., and PACKARD, ROBERT L. On some basic eruptive rocks in the vicinity of Lewiston and Auburn, Androscoggin County, Me.

*Am. Geologist*, July, 1892, pp. 49-55, pl. 1.

The paper describes the mode of occurrence, and general chemical petrographic characters of some of the basic eruptives of the vicinity noted, and which, on structural grounds, are provisionally referred to the camptonites.

METCALF, MAYNARD M. Notes upon an apparently new species of *Octacnemus*, a deep-sea Salpa-like Tunicate.

*Johns Hopkins Univ. Circ.*, xii, No. 106, pp. 98-100, 6 figures.

*Octacnemus patagoniensis*, n. s. (?), dredged by the U. S. Fish Commission steamer *Albatross* off Port Otway, Patagonia, in 1,050 fathoms. This specimen will eventually be added to the Museum collection.

MONTANDON, A. L. Notes on American Hemiptera Heteroptera.

*Proc. U. S. Nat. Mus.*, xvi, No. 924, June 13, 1893, pp. 45-52.

This paper is based upon Museum material.

PACKARD, ROBERT L.

(See under GEORGE P. MERRILL.)

PILSBRY, HENRY A. Monograph of the recent Chitonida.

*Manual of Conchology* (Academy of Natural

## PILSBRY, HENRY A.—continued.

Sciences of Philadelphia), xiv, 1892, pp. 1-XXXIV, 1-350, pls. 1-63.

This work is based in part on material furnished by the National Museum, and also partly on the manuscripts prepared for the Smithsonian Institution by the late Dr. Philip Fearsall Carpenter, which were turned over to Mr. Pilsbry by the Institution to facilitate the preparation of the monograph.

## RATHBUN, MARY J. Catalogue of the crabs of the family Periceridae in the U. S. National Museum.

*Proc. U. S. Nat. Mus.*, xv, No. 901, August 6, 1892, pp. 231-277, pls. XXVIII-XL.

Based on 48 species, chiefly American, of which 15 are new: *Libinia mexicana*, *L. spinimana*, *L. Macdonaldi*, *Periceera atlantica*, *P. triangulata*, *P. contigua*, *Macrocheloma tenuirostris*, *Othonia rotunda*, *O. Nicholai*, *O. carolinensis*, *Mittrax pilosus*, *M. sinensis*, *M. braziliensis*, *M. Hemphilli*, *M. bahamensis*.

## RATHBUN, RICHARD. Report upon the inquiry respecting Food-fishes and the Fishing-grounds.

*Rep. U. S. Fish Com.*, 1889 to 1891 (1893), pp. 97-171.

## — Report on the Department of Marine Invertebrates in the U. S. National Museum, 1890.

*Rep. Smithsonian Inst.* (U. S. Nat. Mus.), 1890 (1891), pp. 223-229.

## RIDGWAY, ROBERT. The Humming Birds.

*Rep. Smithsonian Inst.* (U. S. Nat. Mus.), 1890 (1891), pp. 233-383, pls. 1-XLVI, 47 figures in the text.

The subject of this memoir is treated as follows: Introduction, Early history, Names and their origin, Geographical distribution, Migrations, Habits, Abundance of individuals, Actions and attitudes, Manner of flight, Disposition, Intelligence, Nests and eggs, Voice, Food, Characters and relationships (with a summary of osteological and anatomical characters, prepared by Mr. F. A. Lucas), Variations, Head ornaments, Colors of the plumage, Cause of the changeable hues of humming birds, Brief descriptions of some of the more brilliantly colored kinds, and Humming Birds of the United States, with a key to the genera of humming birds occurring in the United States, Mexico, Cuba, and the Bahamas.

The first part of this treatise, as the titles of the chapters indicate, is of a popular character, intended to interest the general reader, and form an introduction to the study of this most wonderful and beautiful family of American birds. The second part is devoted to the scientific discussion and description of the seventeen species of humming birds which have

## RIDGWAY, ROBERT—continued.

been found within the borders of the United States. A key to all the genera of humming birds found in North America and the West Indies will enable the student to detect any addition to our fauna which he is likely to meet.

— *Zonotrichia albicollis* in California.

*Auk*, ix, No. 3, July, 1892, p. 302.

Notes the capture of an adult specimen in spring plumage by Mr. L. Belding, at Stockton, Cal., April 22, 1892, being the third Pacific coast record of the species.

## — Spring arrivals at Washington, D. C.

*Auk*, ix, No. 3, July, 1892, pp. 307-308.

Records the date of first appearance in the vicinity of Washington of 37 species of spring migrants during the season of April 3 to May 4, inclusive.

— Descriptions of two new forms of *Basileuterus rufifrons*, from Mexico.

*Proc. U. S. Nat. Mus.*, xv, No. 895, July, 1892, p. 119.

*Basileuterus rufifrons Jouyi* and *Basileuterus rufifrons Lugesii* are described.

## — The systematic position of Humming Birds. A reply to Dr. Shufeldt's "Discussion."

*Pop. Sci. News*, xxvi, No. 11, November, 1892, pp. 164-165.

## — Shufeldt on the anatomy of Humming Birds and Swifts.

*Am. Naturalist*, December, 1892, pp. 1040-1041.

Reply to a criticism of "The Humming Birds" by Dr. Shufeldt, in the *American Agriculturist* for October, 1892, pp. 869-870.

## — Description of two supposed new species of Swifts.

*Proc. U. S. Nat. Mus.*, xvi, No. 923, June 13, 1893, pp. 43-44.

*Ciactura Lawrencei*, p. 43, and *Cypseloides Cherviei*, p. 44.

## — Report on the Department of Birds in the U. S. National Museum, 1890.

*Rep. Smithsonian Inst.* (U. S. Nat. Mus.), 1890 (1891), pp. 195-198.

## RILEY, CHARLES V. The number of broods of the imported Elm-Leaf Beetle.

*Science*, xx, No. 492, July 8, 1892, p. 16.

A preliminary note recording the fact that on June 30, 1892, eggs laid by the second brood of beetles had been obtained at Washington.

## — Recent advances in dealing with insects affecting fruits.

*Proc. Am. Entomological Soc.*, 23d Session, September, 1891, pp. 32-42. (July, 1892.)

## RILEY, CHARLES V.—continued.

Discusses the use of the arsenites in the orchard, with specific directions; the combination of insecticides with fungicides; the gas treatment; the resin washes; the fluted scale, *Icerya purchasi*, Maskell; new injurious insects of a year; the apple maggot; insects which American pomologists would do well to be on their guard against; conclusions.

Partly reprinted in *Insect Life*, v, No. 1, pp. 16-19.

## — The first larval or post-embryonic stage of the Pea and Bean weevils.

*Canadian Entomologist*, v, XXIV, No. 7, August, 1892, pp. 185-186. (Also separate.)

A short note upon the curious temporary thoracic legs in *Bruchus fabae* (*obtectus*) and *B. pisi*, which serve them in entering the bean or pea and are then lost with the first molt. The classificatory significance of these hereditary post-embryonic structures is discussed.

— Some notes on the Margined Soldier-beetle (*Chauliognathus marginatus*).

*Canadian Entomologist*, v, XXIV, No. 7, August, 1892, pp. 186-187. (Also separate.)

Records and describes the eggs of this species hitherto unknown. As many as 300 are laid in a single mass. The first larva stage is also compared with the final stage.

## — Some interrelations of plants and insects.

*Proc. Biol. Soc. Wash.*, vii, May 28, 1892, pp. 81-104.

*Insect Life*, iv, No. 11-12, August, 1892, pp. 358-378, figs. 57-75.

Also as a separate.

Discusses the pollination of *Yucca filamentosa* by *Pronuba yuccasella*; the structural characteristics of *Pronuba*; the acts of pollination and oviposition, the development and transformations of *Pronuba*; the bogus *Yucca* moth; other species of *Prodoxus*; caprification of the figure. In generalizing from the facts, the author indicates three principal lines along which variation has proceeded; shows how these *Prodoxids* exemplify what he originally called "fortuitous variation;" and discusses the transmission of acquired characters through heredity.

## — Rose Saw-flies in the United States.

*Insect Life*, v, No. 1, September, 1892, pp. 6-11, figs. 1-2.

Observations upon the Bristly Rose-worm, *Cladius pectinicornis*, Fourcr.; the Banded Emphytus, or Curled Rose-worm, *Emphytus cinctus*, L.; and the American Rose-slug, *Monostegia rosea*, Harris. Life history of the three species compared and original observations given. All are amenable to treatment with hellebore.

## — New injurious insects of a year. Extracted from a paper entitled

## RILEY, CHARLES V.—continued.

"Recent Advances in Dealing with Insects Affecting Fruits," read before the American Pomological Society, September, 1891.

*Insect Life*, v, No. 1, September, 1892, pp. 16-19.

Forty-five hitherto unrecorded species, reported to the Department of Agriculture during one year as injuring various crops, are enumerated.

## — Further notes on the new Herbarium Pest.

*Insect Life*, v, No. 1, September, 1892, pp. 40-41.

The new herbarium pest, *Carphoxera ptelearia*, described in *Insect Life*, iv, pp. 108-113, was thought by Mr. R. McLachlan to be very like *Acidalia herbariata*, Fab., long known to injure herbarium specimens in Europe. By comparison of the imago of the two species, however, the author finds that the European moth is twice as large as the American species, more glossy, and differently marked in detail. In structural characters *Carphoxera ptelearia* is easily distinguished from *Acidalia herbariata* by the spatulate tubercles of the larvæ, by the lateral projection on the fifth abdominal joint of the pupa, and by its much smaller size, more pulverulent, less glossy scaling, and different markings in the imago.

## — Preservation of hard-wood handles.

*Scientific American*, LXVII, No. 14, October 1, 1892, p. 216.

Report upon an insect damaging hard-wood handles; probably one of the powder-post beetles of the genus *Lyctus*, species undetermined. Soaking the infested handles in kerosene is recommended as a remedy.

## — California Beer Seed.

*Scientific American*, LXVII, No. 14, October 1, 1892, p. 217.

Report upon a specimen of a fermenting principle, the action of which is due to a bacterium and a fungus, the species of which have not been definitely settled, though the former is probably *Dispora caucasica* and the latter *Saccharomyces kefur*.

— An Australian *Scymnus* established and described in California. Paper read before the Rochester meeting of the Association of Economic Entomologists, August, 1892.

*Scientific American*, LXVII, No. 18, October 29, 1892, p. 275; *Insect Life*, v, No. 2, November, 1892, pp. 127-128.

An Australian Coccid-feeding Coccinellid brought over by Mr. Albert Koebler in 1888-'89, and subsequently lost sight of, has turned up in southern California and been described by Dr. F. E. Blaisdell under the name *Scymnus lophanthæ*, as an American species.

RILEY, CHARLES V.—continued.

— *Galeruca xanthomelana* polygonentica at Washington. Read before the Entomological Club of the American Association for the Advancement of Science, at Rochester, N. Y., August, 1892.

*Canadian Entomologist*, v, XXIV, No. 10, November, 1892, pp. 282-286.

Shows that while *Galeruca xanthomelana*, according to Prof. John B. Smith's experiments, is single-brooded at New Brunswick, N. J., it is normally double-brooded at Washington, and by exception produces a third and even a fourth generation there. Discusses the bearing of these facts in the light of climatic influence in relatively short periods.

— An additional note on the Bean Weevil.

*Canadian Entomologist*, v, XXIV, No. 10, November, 1892, pp. 291-299.

In a note in the August, 1892, number of the *Canadian Entomologist* the author stated that the eggs of the Bean Weevil "are preliminarily laid upon the bean pod in the field, but chiefly if not entirely upon those which are already matured and ripening." The present note records the fact that the eggs hitherto taken for those of the common Bean Weevil, without much doubt, those of another *Bruchus*, either *Bruchus quadrimaculatus* or *B. scutellaris*, and that the eggs of the Bean Weevil are thrust into an aperture made by the jaws of the parent weevil along the ventral suture, or else laid in clusters on the inside of the pod wherever this is sufficiently ripe to cause a partial opening.

— Coleopterous larvæ with so-called dorsal prolegs.

*Proc. Ent. Soc. Wash.*, 11, No. 3, December, 1892, pp. 319-324, figs. 22-23. (Also separate.)

Shows that two kinds of larvæ with supposed dorsal prolegs, referred to by Herbert Osborn and others at the Indianapolis (1890) meeting of the American Association for the Advancement of Science, belong to *Mordellistena*, and to some Cerambycid, and that the "prolegs" are but abnormally developed tubercles to facilitate motion within the hollow stems. Cites authorities and records the larva of *Mordellistena pustulata* in dry stalks of *Xanthium strumarium*; of *M. unicolor* in stems of *Ambrosia artemisiifolia*; of *M. nubilata* from stems of *Triodia cupressæ*; full transformations of *M. floridensis* in stems of *Uniola paniculata*; and of *Obreuca schammii* in stems of cottonwood.

— What the Department of Agriculture has done and can do for apiculture.

*Proc. 23d Ann. Meeting of the North American Bee-keepers' Association*, December 27-29, 1892.

RILEY, CHARLES V.—continued.

Reprinted in the *Canadian Bee Journal* and various other apicultural journals.

A review of past work in apiculture, with recommendations for the future. The address signals the fact that the first introduction of Italian bees into the United States was due to the Department of Agriculture, and touches upon the work of the apicultural stations at Aurora, Ill., in 1885, and at Michigan Agricultural College in 1891, summarizing the results of experiments upon foul brood, the relation of bees to fruit, spraying with the arsenites as affecting bees, selection in breeding, etc. Recommendations follow that the Department of Agriculture secure the introduction and domestication of desirable foreign races of bees, experiment in the crossing and mingling of races already introduced, in artificial fertilization, the true causes of disease, etc.

— New species of Prodoxidae.

*Proc. Ent. Soc. Wash.*, 11, No. 3, December, 1892, pp. 312-319, figs. 15-21.

Includes technical descriptions of the following new species: *Pronuba synthetica* (larva, chrysalis, and imago); *Prodoxus pulverulentus*. *P. y-inversus*, *P. reticulatus*, *P. coloradensis*, and *P. sordidus*.

— On certain peculiar structures of Lepidoptera.

*Proc. Ent. Soc. Wash.*, 11, No. 3, December, 1892, pp. 305-312, figs. 13-14. (Also separate.)

The paper describes some of the remarkable structures of the species of *Pronuba* and *Prodoxus* under the heads: (1) The radiate bodies in the *receptaculum seminis* of *Pronuba* and *Prodoxus*; (2) *Pseudo-cenchri*; (3) The tegulae and the patagia. The radiate bodies referred to, if they occur at all in other insects, are never found in anything like the remarkable development in which they exist in the species of the family Prodoxidae. Their function seems to be to liberate the spermatozoa from the spermato-phores. In connection with two cenchri-like spots on the metathorax of *Pronuba synthetica*, the author discusses the cenchri of Lepidoptera and concludes that they are more likely organs of sound than of any other sense. In discussing the tegulae and patagia it is shown that much confusion on the part of authors in the use of these terms has existed, and the original definitions of Westwood and Kirby and Spence are held to be the proper guides.

— Report of the Entomologist.

*Rep. Sec. Agric.* 1892, Washington, Government Printing Office, 1893, pp. 153-180.

Contains the following titles: Introduction, pp. 153, 154; The work of the season, pp. 154-167; Work of the field agents, pp. 167-170; The Pea and Bean Weevils (*Bruchus pisi*, L. and *B. obtectus*, Say), pp. 170-172; The Sugar-beet Web-worm, *Loxostege sticticalis*, Linn., pp. 172-

## RILEY, CHARLES V.—continued.

175; The Shot-borer or Pin-borer of the Sugar Cane (*Xyleborus perforans*, Woll), pp. 175-178; The Insectary of the Division, 178-179.

Also printed as a separate under the title "Report of the Entomologist for 1892." Washington, 1893, with table of contents, plates and index.

— Note on *Loxostege macluræ*, n. s.

*Insect Life*, v, No. 3, January, 1893, pp. 157-158.

A supplementary note to an article by Miss Mary E. Murtfeldt on this insect, characterizing the species, hitherto undescribed.

## — Insect communities. A lecture delivered at the Brooklyn Institute, February 3, 1893.

*Brooklyn Daily Eagle*, February 4, 1893.

Habits of some social insects, and the polity of the hive of the honey bee. Refers to instincts of many social insects, and concludes that instinctive and inevitable actions on the part of insects are associated with others which result from the possession of intelligence, of conscious reasoning and reflective powers.

"Just among the mammalia, the higher intellectual development, as in man, is physiologically correlated with the longest period of dependent infancy; that this helpless infancy has been, in fact, a prime influence in the origin, through family, clan, tribe, and state, of organized civilization; so in the insect world we find the same physiological correlation between the highest intelligence and dependent infancy, and are justified in concluding that the latter is in the same way the cause of the high organization and division of labor, the cause and explanation which so baffled Darwin in the application of his grand theory of evolution to social insects."

## — Hickory wood carved by worms.

*Scientific American*, March 11, 1893, p. 148.

A popular account of *Scolytus caryæ*, Riley (*S. spinosus*, Say), with illustrations of a particularly fine specimen of its work, and that of *Saperda discoidæ*, which is almost always associated with it.

— The genus *Dendrotettix*.

*Insect Life*, v, No. 4, April, 1893, pp. 254-256.

A characterization of *Dendrotettix longipennis*, new genus and species. The paper was read by title before the Entomological Society of Washington, March 9, 1892.

## — Report on a small collection of insects made during the Death Valley Expedition.

*North Am. Fauna*, May, 1893, pp. 235-255.

Also separate, published by the Division of Ornithology and Mammalogy of the U. S. Department of Agriculture.

## RILEY, CHARLES V.—continued.

A list of the species of Coleoptera, Lepidoptera, Hymenoptera, Orthoptera, and Neuroptera, collected by Mr. Albert Koebele during the expedition, with conclusions drawn from the same. Also comprises reports with descriptions of new species from P. R. Uhler on the Hemiptera, and from S. W. Williston on the Diptera.

## — (Editor.) Reports of the United States Commissioners to the Universal Exposition of 1889 at Paris. Vol. v. Agriculture, 1891, pp. 1-935, pls. 1-78, figs. 1-219.

Report as expert commissioner of the eighth group, and as representative of the Department of Agriculture. Part I contains: Report on agriculture, vine cultivation, etc., including a report on field trials of machinery. Part II contains: Report on the agricultural exhibit and agricultural products of the United States. Besides the introductory chapter, the following articles by the editor are contained in Part I: Agronomy and agricultural statistics; Organization, methods, and appliances of agricultural instruction; Field trials of machines, and Vine cultivation. By C. V. Riley and Amory Austin: Farm improvements and agricultural work; Exhibitions of live stock. Part II contains chapters by the editor entitled: Brief history of the exhibit; Injurious and beneficial insects in the United States.

## — Parasitism in insects. Annual address of the president.

*Proc. Ent. Soc. Wash.*, II, No. 4, June, 1893, pp. 397-431. Also separate, pp. 1-35.

A general consideration of the subject of parasitism among arthropods. As a useful working system the author divides insect parasites into: I. Parasites proper, or those which can not exist apart from the host; II. Fatal parasites, which as a rule involve the death of the host; and III. Inquilinous parasites, including those insects which sponge on the labors of other insects. These primary divisions permit of subdivision, and the subject is dealt with in detail under the following subheads: Animals affected; the parasites among insects, dealt with by orders; the derivative origin of insect parasitism; effects of the parasitic life: economic bearing of parasitism: conclusions.

— Is *Megastigmus* phytophagic?

*Proc. Ent. Soc. Wash.*, II, No. 4, June, 1893, pp. 359-363.

The author presents facts gathered from Herman Borries, of Denmark, the writings of Parfitt, Mayr and Wachtl, and his own observations, and concludes that while there is every reason to believe that the genus is essentially parasitic, some of its species may be phytophagic.

RILEY, CHARLES V. Further notes on Yucca insects and Yucca pollination.

*Proc. Biol. Soc. Wash.*, VIII, June 20, 1893, pp. 41-54, pl. IX. Also separate, author's edition.

Supplementary to the author's previous paper on "Some Interrelations of Plants and Insects," in Volume VII of the same Proceedings.

Summarizes the observations of Prof. William Trelease and D. W. Coquillett on the habits of *Pronuba maculata* in pollinating *Yucca whipplei*; also the former's observations on the habits of *Pronuba synthetica* on *Yucca brevifolia*. Records a black variety (*aterrima* Trelease) of *Pronuba maculata*, confined to the *graminifolia* variety of *Y. whipplei*, and extends the range of *Pronuba yuccae-sella* to the Pacific coast. Describes *Prodoxus intricatus* n. s. from *Yucca guatemalensis* and characterizes the hitherto unknown male of *Prodoxus intermedius* and the larvæ of *P. coloradensis* and *P. cinereus*. The larva of *P. cinereus* is remarkable in that it bears on its ventral plate two stout, brown decurved horns, resembling those of the larva of *Trogosita*. Mentions the only other known instances of similar anal hooks in Lepidopterous larvæ, viz. in *Alucita kellicottii*, Fish, another Pterophorid, undescribed, and the larva of *Hadena stipata*, Morr., and argues that these structures, approaching as they do, those which are common to many boring Coleopterous larvæ, are independent consequences of habit and environment, and show the relative valuelessness of larval characters for taxonomic purposes.

— Reports of observations and experiments in the practical work of the division.

*Bull. Div. Ent., No. 30, U. S. Dept. Agric.*, Washington, June, 1893, pp. 1-67.

Contains the reports of the field agents of the Division of Entomology, with letter of transmittal and introductory summary by C. V. Riley.

— Report on the Department of Insects in the U. S. National Museum, 1830.

*Rep. Smithsonian Inst. (U. S. Nat. Mus.)*, 1830 (1891), pp. 219-221.

RILEY, CHARLES V., and HOWARD, L. O. The first larval stage of the Pea Weevil.

*Insect Life*, IV, No. 11-12, August, 1892, p. 392.

The pea weevil, as well as the bean weevil, passes through a post-embryonic stage, during which it possesses false legs, which are afterwards lost.

— On the nomenclature and oviposition of the Bean Weevil.

*Insect Life*, v, No. 1, September, 1892, pp. 27-33.

In Dr. Horn's revision of the Bruchidae the Bean weevil is given as *Bruchus obsoletus*.

RILEY, CHARLES V., and HOWARD L. O.—continued.

Say, but the authors consider that the Bean weevil is distinct from *obsoletus*. Say found *obsoletus* on a species of *Astragalus*, from which he also obtained *Apion segnipès*.

Mr. Schwarz has found a *Bruchus* in connection with this very *Apion segnipès* on *Tephrosia virginiana*, near Washington, and this *Bruchus* agrees fully with Say's description of *B. obsoletus*. All who have gone over the synonymy carefully will admit that *B. obtectus*, Say, which precedes *B. obsoletus* in the descriptions, is more plainly referable to our Bean weevil. The synonymy of the species from *B. obtectus* Say (1831) to *B. subarmatus* Janson (1889) is given. Its habits of oviposition in the field are discussed, and it is found that the eggs are invariably placed in the pod.

— The Australian enemies of the red and black scales.

*Insect Life*, v, No. 1, September, 1892, pp. 41-43.

Records the observations of Mr. D. W. Coquillett on the condition of *Oreus chalybeus* and *O. australis*, introduced from Australia for the purpose of destroying *Aspidiotus aurantii* and *Lecanium oleæ*.

— A curious Chrysalis.

*Insect Life*, v, No. 2, November, 1892, p. 131.

A brief note upon the remarkable Bombycid chrysalis of *Saturnia arnobia*, Westwood, found by Mr. Good in West Africa.

— The Glassy-winged Sharpshooter (*Homalodisca coagulata*, Say).

*Insect Life*, v, No. 3, January, 1893, pp. 150-154, fig. 10.

From the peculiar effect of its punctures on young cotton bolls, and also from its power of rapidly and forcibly ejecting minute drops of liquid, this insect derives its name of "Sharpshooter" in the South. A single application of kerosene emulsion to young poplar growth along the borders of cotton fields about the second week in May is recommended.

— Food-plants of North American species of *Bruchus*.

*Insect Life*, v, No. 3, January, 1893, pp. 165-166.

A table of the food-plants of various species of *Bruchus*, compiled from Riley's records, those of the Division of Entomology, and from other sources.

— An interesting Water Bug (*Rheumatobates Rileyi*, Bergroth.)

*Insect Life*, v, No. 3, January, 1893, pp. 189-193, figs. 18-20.

Detailed description of this curious Hydro-metrid, with figures by O. Heideman, who cap-

## RILEY, CHARLES V., and HOWARD, L. O.—continued.

tured specimens of both sexes near Washington. Two forms of male occur, those with normal and those with abnormal and incrassated hind legs.

— The Orange Aleyrodes (*Aleyrodes citri*, n. s.).

*Insect Life*, v, No. 4, April, 1893, pp. 219-226, figs. 23-24.

This is perhaps the most important of the family Aleyrodidae, infesting oranges in Florida and Louisiana and greenhouses further north. It is described and figured in detail, and its habits and life-history, natural enemies and remedies, are discussed.

## — The pear-tree Psylla.

*Insect Life*, v, No. 4, April, 1893, pp. 226-230, figs. 25-29.

A careful and critical review of Bulletin 44, Cornell University Experiment Station, by Mark V. Slingerland, some of the author's figures being reproduced by permission.

## — Editorials and notes.

*Insect Life*, iv, Nos. 11-12, August, 1892; v, Nos. 1-4, September, 1892, to April, 1893.

See table of contents of each number of *Insect Life*.

## — Correspondence of the Division of Entomology, U. S. Department of Agriculture.

*Insect Life*, iv, No. 11-12, August, 1892; Nos. 1-4, September, 1892, to April, 1893.

Selected letters from correspondents, with replies.

## ROSE, JOSEPH NELSON. List of plants collected by Dr. Edward Palmer in 1890 on Carmen Island.

*Contrib. U. S. Nat. Herbarium*, 1, September, 1892, pp. 129-134.

An account of Carmen Island is given, with a list of the species. Five species and a variety are described as new. This paper is based upon Museum material.

— A new *Tabebuia* from Mexico and Central America.

*Botan. Gaz.*, xvii, December, 1892, pp. 418-419.

*Tabebuia Donnell-Smithii* is described and figured. This tree is the *Primavera* or white mahogany of commerce, and for a number of years has been extensively brought into the eastern markets from Mexico. This paper is based upon Museum material.

— *Agave angustissima*.

*Garden and Forest*, vi, January, 1893, pp. 5-6.

## ROSE, J. N.—continued.

An account of the rediscovery of this little-known plant, with a fuller description and illustrations. This paper is based upon Museum material.

## — Undescribed species from Guatemala.

*Botan. Gaz.*, xi, June, 1893, pp. 198, 206, 207.

Three new species are described from J. Donnell Smith's third distribution of Guatemalan plants. This paper is based upon Museum material.

## ROSE, J. N., and CANBY, WILLIAM M. George Vasey: A biographical sketch.

*Botan. Gaz.*, xviii, May, 1892, pp. 170-183, with portrait.

## ROSE, J. N., and COULTER, JOHN M. Notes on North American Umbelliferae.

*Botan. Gaz.*, xviii, February, 1892, pp. 54-56.

A list of the Umbelliferae in Mr. John Donnell Smith's distribution is given, and one new species and a new genus are described. The latter is figured. This paper is based upon Museum material.

## — New and little-known plants collected on Mount Orizaba in the summer of 1881.

*Proc. Am. Acad. Arts and Sci.*, xxviii, June, 1893, pp. 118-119.

Two new species of Mexican Umbelliferae are described by Mr. Henry L. Seaton. This paper is based upon Museum material.

ROSE, J. N. (and others). List of plants collected by the U. S. Fish Commission steamer *Albatross* in 1887-'91 along the western coast of America.

*Contrib. U. S. Nat. Herbarium*, 1, September, 1892, pp. 129-134.

A list of the plants of Cedros Island and Galapagos Island, with a description of one new species. This paper is based upon Museum material.

## SCLATER, PHILIP LUTLEY. Lucas on explorations in Labrador.

*Ibis*, iv, No. 15, p. 453.

Editorial review of paper in *Rep. Smithsonian Inst.* (U. S. Nat. Mus.), 1889, p. 709.

— Ridgway on the genus *Sittasomus*.

*Ibis*, iv, No. 15, p. 457.

Editorial review and criticism of paper in the *Proc. U. S. Nat. Mus.*, xiv, p. 597.

## — Stejneger on the cubital coverts of the Paradise Birds.

*Ibis*, iv, No. 15, p. 463.

Editorial notice of paper in the *Proc. U. S. Nat. Mus.*, xiv, p. 499.

SCLATER, PHILIP LUTLEY. Mr. P. L. Jouy's collection.

*Ibis*, IV. No. 16, p. 577.

Editorial notice of the acquiring of the collection of Korean and Tsushima birds by the National Museum, with brief reference to the more important species mentioned

— Stejneger on Mr. Henson's collection from Yezo, Japan.

*Ibis*, v. No. 18, pp. 272-273.

Editorial notice and commentary on paper in *Proc. U. S. Nat. Mus.*, xv, p. 289.

SCOLLICK, J. W. On the making of gelatin casts.

*Proc. U. S. Nat. Mus.*, xvi, No. 926, June 13, 1893, pp. 61-62.

Describes a method of making casts of invertebrates, combs of fowls, etc.

SHUFELDT, ROBERT W. More inspirational archaeology.

*Religio-Philosophical Journ.*, 3, No. 11, Chicago, August 6, 1892, p. 166.

A study of the Indian pests in the collection of the U. S. National Museum, pointing out the fraud of certain parties who claimed to have discovered one, assisted by spirit influence, near Unadilla, N. Y. Written at the request of a member of the Society of Psychical Research of London.

— A maid of Walpai.

*Proc. U. S. Nat. Mus.*, xv, No. 889, August 4, pp. 29-31, pl. 1.

A popular description of the life of one of the young girls of the Wolpai Pueblo of Arizona.

— The evolution of house-building among the Navajo Indians.

*Proc. U. S. Nat. Mus.*, xv, No. 902, August 2, 1892, pp. 279-282, pls. XLI-XLIII.

An account which goes to show the progressive changes which have taken place in the building of primitive Indian houses, due to the advances of civilization. Plates give figures of the original "hogan" and the modified houses now built by the Navajoes, from photographic views by the author.

— Review of some recent publications of the U. S. National Museum.

*Science*, xx, No. 498, New York, August 19, 1892, pp. 106-107.

— A discussion of Mr. Ridgway's notions in regard to the systematic position of the Humming Birds.

*Pop. Sci. News*, xxvi, No. 9, Boston, September, 1892, p. 131.

— Studying birds with an opera glass.

*Observer*, III, No. 9, Portland, Conn., September, 1892, pp. 283-284.

SHUFELDT, R. W. A comparative study of some Indian homes.

*Pop. Sci. Monthly*, xli, No. 6, New York, October, 1892, pp. 798-810, 5 figures.

Compares the houses built by the Moquis, the Acomas, the Apaches, the Navajoes, and other puebloan and field Indians of Arizona and New Mexico.

— Ridgway on the Humming Birds.

*Nature*, No. 1194, vol. 46, London, September 15, 1892, p. 465.

A brief criticism of Mr. Ridgway's work on "The Humming Birds."

— Ridgway on the anatomy of Humming Birds and Swifts.

*Am. Naturalist*, Philadelphia, October, 1892, pp. 869-870.

— Scientific Taxidermy.

*Great Divide*, VII, No. 4, Denver, Colo., December, 1892, pp. 197-198.

This article is illustrated by the reproduction of a photograph of the polar bear, one of the mounted specimens in the collection of the U. S. National Museum. The article comments upon the progress being made in the science of taxidermy at the National museums in Washington.

— On the vernacular name of the genus *Harporhynchus*.

*Science*, xx, No. 54, New York, December 9, 1892, p. 333.

— The systematic position of the Humming Birds: A rejoinder to Mr. Ridgway.

*Pop. Sci. News*, xxvii, No. 1, Boston, January, 1893, pp. 3-4.

— *Sitta canadensis* appearing in numbers in the District of Columbia.

*Auk*, No. 1, January, 1893, p. 88.

— Comparative notes on the Swifts and Humming Brds.

*Ibis*, v, No. 17, Art. VII, London, January, 1893, pp. 84-100, 6 figures in the text. This paper is based upon Museum material.

— Notes on Palæopathology.

*Pop. Sci. Monthly*, xlii, No. 5, New York, March, 1893, pp. 679-684, 2 figures in the text.

Palæopathology is a word coined by the author to indicate the science which takes into consideration the study of the evidences of accidents and diseases in the fossil remains of animals, and comparing them with those affecting the corresponding tissues in existing forms. Fossil fractures are figured and described.



SHUFELDT, ROBERT W. A chapter on snakes.

*Great Divide*, Denver, Colo., March, 1893, pp. 16-17, 5 figures in the text.

A popular description of harmless and poisonous snakes of this country and elsewhere, as well as characters by which they may be distinguished. Reference made to many specimens collected by the author and now in the U. S. National Museum.

— On the classification of the Longipennes.

*Am. Naturalist*, XXVII, No. 315, Philadelphia, March, 1893, pp. 233-237.

It proposes a suborder for the Longipennes, to be divided into three families, viz. the Laridae, the Stercorariidae, and the Rhyncopidae. The Laridae to be divided into subfamilies, viz. the Larinae and the Sterninae. The study is based upon an examination of the osteological material in the National Museum and in the author's own collection.

— The Chionididae. A review of the opinions on the systematic position of the family.

*Auk*, X, No. 2, New York, April, 1893, pp. 158-165.

Proposes the following classification: Suborder, *Chionides*; family, Chionididae; genera, *Chionarchus*, *Chionis*; species, *Chionarchus minor*, *Chionis alba*. Tshi paper is based upon Museum material.

— Ridgway on the anatomy of the Humming Birds and Swifts: A rejoinder.

*Am. Naturalist*, XXVII, No. 316, Philadelphia, April, 1893, pp. 267-271.

— Comparative osteological notes on the extinct bird *Ichthyornis*.

*Journ. Anatomy and Physiology*, XXVII, new series, VII, Part III, Art. 2. London, April, 1893, pp. 336-342.

Critically compares *Ichthyornis* with *Larus*, *Sterna* and allied forms, and points out the fact that there are a number of osteological resemblances between the skulls of *Ichthyornis* and *Rhynchops*, and a great many more than we find between *Ichthyornis* and *Sterna*, as was supposed to be the case by Marsh.

This paper is based upon Museum material.

— Humming Birds and Swifts again.

*Pop. Sci. News*, XXVII, No. 5, Boston, May, 1893, p. 75.

— Queer Beasts.

*National Tribune*, XII, No. 44, (whole No. 616), Washington, D. C., June 1, 1893, p. 8.

A popular illustrated article describing a number of the fossil remains of animals in the collections of the U. S. National Museum and elsewhere, and other matters pertaining thereto.

SIMPSON, CHARLES TORREY. Collecting notes.

*Nautilus*, VI, No. 4, August, 1892, pp. 37-40.

— Notes on the Unionidae of Florida and the Southeastern States.

*Proc. U. S. Nat. Mus.*, XV, No. 911, October 28, 1892, pp. 405-436, pls. XLIX-LXXIV.

The above paper attempts an outline of the natural system of classification of the Unionidae and of their distribution in North America. The species of the region in question are compared and arranged in groups, illustrated with outline figures, and a large number are reduced to synonymy. *Unio sublaridus* Simpson, *U. singleyanus* (Marsh. MS.), and *U. ferriati* (Marsh. MS.), are described as new.

— On a revision of the American Unionidae.

*Nautilus*, VI, No. 7, November, 1892, pp. 78-80.

— A new *Anodonta*.

*Nautilus*, VI, No. 12, April, 1893, pp. 134-135.

*Anodonta Marcsoniana*, from Arizona, described as new.

— *Unio coruscus*, *sublaridus*, etc.

*Nautilus*, VI, No. 12, April, 1893, pp. 143-144.

— On the relationships and distribution of the North American Unionidae, with notes on the west coast species.

*Am. Naturalist*, XXVII, No. 316, April, 1893, pp. 353-358.

In this paper a more elaborate statement is made of the distribution and relationship of our North American naiades, and an attempt is made to trace the origin of the Pacific Coast forms.

— A review of von Ihering's classification of the Unionidae and Mutelidae.

*Nautilus*, VII, No. 2, June, 1893, pp. 17-21.

— A reply to Prof. Wheeler.

*Nautilus*, VII, No. 2, June, 1893, pp. 22-23.

SMITH, HUGH M. Report on a collection of fishes from the Albemarle region of North Carolina.

*Bull. U. S. Fish Com.*, 1891, pp. 185-200. This paper is based in part upon Museum material.

SMITH, JOHN B. Revision of the genus *Cucullia*; revision of the Dicopinae; revision of *Xylomiges* and *Morissonia*.

*Proc. U. S. Nat. Mus.*, XV, No. 890-892, August 8, 1892, pp. 33-86, pls. II-III. This paper is based upon Museum material.

STANTON, TIMOTHY W. The faunas of the Shasta and Chico formations.

*Bull. Geol. Soc. Am.*, iv, June 1893 pp. 245-256.

A brief discussion of the cretaceous fossils of the Pacific Coast region, based mainly on collections from the Sacramento Valley, in northern California. It is shown that the Shasta and Chico formations are closely related faunally, having many species in common, and they are therefore regarded as parts of one continuous series. This paper is based upon Museum material.

STEARNS, ROBERT E. C. Death Valley Expedition, Part II, No. 5. Report on mollusks.

*North Am. Fauna*, No. 7, May, 1893, pp. 269-283, 2 figures in the text.

*Fluminicola Merriami*, Pilsbry and Beecher, and *Annicola micrococcos*, Pilsbry, are described as new, and the existence in a living state of *Trypania clathrata*, Stm., is announced.

— Preliminary descriptions of new mollusean forms from west American regions, etc.

*Nautilus*, vi, No. 8, December, 1892, pp. 85-89.

*Tranilla regina*, *Chlorostoma gallina*, var. *multiflora*, *Bulinulus Habeli*, *Onchidium Lesliei*, *Littorina (Tectarius) galapagiensis*, *Nitidella incerta*, and *Littorina (Tectarius) atypus* are described as new.

— Description of a new species of *Nassa* from the Gulf of California.

*Nautilus*, vii, No. 1, May, 1893, pp. 10-11. *Nassa brunneostoma* described as new.

STEJNEGER, LEONHARD. Notes on a collection of birds made by Harry V. Henson in the Island of Yezo, Japan.

*Proc. U. S. Nat. Mus.*, xv, No. 904, August 6, 1892, pp. 289-359, pl. XLV.

New species and subspecies described: *Parus Hensoni*, p. 342, and *Hyppipites amaretis Hensoni*, p. 347. Four additions to the Japanese fauna are noted, viz: *Hemichelidon griseisticta*, *Otocorys alpestris*, *Falco rusticolus*, and *Urinator pacificus*. Species new to the Island of Yezo are *Turdus obscurus*, *Cichloselys sibiricus*, *Tringa canutus*, *Terekia cinerea*, and *Nettion formosa*. Sixty-five species are noted in the present paper, twenty-eight of which are discussed critically, and are accompanied by copious notes and emendations of synonymy.

Changes in nomenclature are as follows: *Podiceps nigricans* (Scop.) for the Little Grebe, in place of *P. auritus*  $\gamma$  (L.), *P. fluviatilis*, Trnstell, minutus, Lath., or *philippensis*, Bonaterre, *Ceryle lugubris* (Temm.) is retained for the name of the Japanese bird which is considered distinct from the Himalayan, which it is proposed to call *C.*

STEJNEGER, LEONHARD—continued.

*guttulata*, as *C. guttata* of Vigors is preoccupied. The name *Cichloselys* is restricted to the Siberian thrush as being the only species of the group requiring a separate name. *Monticola manilla* (Bodd.) is provisionally adopted for the eastern form of the Rocky Mountain thrush which is distinguished from the European bird by size, color, and wing-formula. *Cyanoptila bella* (Hay) for the Blue and Black Flycatcher, *C. yanomelena* and *C. gularis* being both untenable. *Poliomyia ferruginea* (Gmel.) in place of *P. luteola* Pallas, or *P. mugimaki* of Temminck, *Troplexis* (new genus) is substituted for *Trospheena*, preoccupied. *Sturnia violacea* (Bodd.) takes precedence over *pyrrhogenys* of Temm. & Schleg. *Sturnus cineraceus*, Temm., is placed in the genus *Acrithothes*. An exhaustive study of the two forms of Pied wagtails of Japan is given; all the various stages of plumage are described and further distinguished by a tabular synopsis, plate XLV illustrating the wing feathers of *Motacilla lugens*.

— Two additions to the Japanese Avifauna, including description of a new species.

*Proc. U. S. Nat. Mus.*, xv, No. 906, September 16, 1892, pp. 371-373.

*Tringa Temminckii* (Leisl.) and *Acanthopneuste ijima* Stejn., the latter being now described for the first time.

— Supplementary remarks on the genus *Pitta*.

*Auk*, x, No. 2, April, 1893, pp. 181-184.

A critical review of Mr. Elliott's paper on the genus *Pitta*, Vieillot, with a discussion as to the dates of publication of Vieillot's "Analyse" and the fourth volume of the "Nouveau Dictionnaire d'Histoire Naturelle."

— Report on the Department of Reptiles and Batrachians in the U. S. National Museum, 1890.

*Rep. Smithsonian Inst.* (U. S. Nat. Mus.), 1890 (1891), pp. 201-203.

— Preliminary description of a new genus and species of Blind Cave Salamander from North America.

*Proc. U. S. Nat. Mus.*, xv, No. 894, August 4, 1892, pp. 115-117, pl. IX.

Described as a new genus, *Typhlotriton*; as a new species, *T. spelæus*, from Rock House Cave, Mo. Type, U. S. National Museum, No. 17903.

— Diagnosis of a new California lizard.

*Proc. U. S. Nat. Mus.*, xvi, No. 944, advance sheet, May 27, 1893, p. 467.

Described as a new species, *Xantusia Henshawi*, from Witch Creek, Cal. Type, U. S. National Museum, No. 20339.

STEJNEGER, LEONHARD. Skeletons of Steller's Sea-cow preserved in the various museums.

*Science*, XXI, February 10, 1893, p. 81.

Correcting an article by Prof. B. W. Evermann in a previous number of the same journal.

— Notes on the generic name *Chirotes*.

*Science*, XXI, March 24, 1893, pp. 157-158.

Shows that *Bipes* Latr. has priority over *Chirotes* Cuv. Full synonymy of the genus.

— Annotated list of the reptiles and batrachians collected by the Death Valley Expedition in 1891, with description of new species.

*North Am. Fauna*, No. 7, pp. 159-228, pls.

I-IV.

A full report upon the herpetological collections of the Death Valley Expedition, with interpolated field notes by Dr. C. Hart Merriam. One new genus name is proposed, viz, *Hemitheconyx*, for *Pseudodaelytus* Gray, preoccupied. New species and subspecies described: *Coleonyx brevis*, *Sceloporus Boulengeri*, *Sceloporus Orcutti*, *Phrynosoma cervause*, *Phrynosoma Goodei*, *Gerrhonotus seincicauda Palmeri*, *Hypsiglena texana*, *Bascanion flagellum frenatum*, *Pituophis catenifer deserticola*, *Bufo boreas nelsoni*, *Rana Fisheri*. All the types are in the National Museum.

SUCHETET, ANDRÉ. Les Oiseaux Hybrides rencontrés à l'état sauvage. Troisième partie. Les Passereaux.

*Mém. Soc. Zool. de France*, v, 1882, pp. 253-255. (Reprint, with new title-page and pagination, pp. 179-451.)

An elaborate treatise on wild hybrids, in which many specimens in the U. S. National Museum are mentioned.

TEST, FREDERICK C. Fish-cultural investigations in Montana and Wyoming. Annotated list of the reptiles and batrachians collected.

*Bull. U. S. Fish Com.*, 1891, pp. 57-59.

Report upon a collection made by Prof. B. W. Evermann in Montana and Wyoming, while investigating the rivers of those States.

TRUE, FREDERICK W. An annotated catalogue of the mammals collected by Dr. W. L. Abbott in the Kilima-Njaro region, East Africa.

*Proc. U. S. Nat. Mus.*, xv, No. 915, October 26, 1892, pp. 445-480, pls. LXXV-LXXX.

— Report on the Department of Comparative Anatomy in the U. S. National Museum, 1890.

*Rep. Smithsonian Inst.* (U. S. Nat. Mus.), 1890 (1891), pp. 231-232.

TRUE, FREDERICK W. Report on the Department of Mammals in the U. S. National Museum, 1890.

*Rep. Smithsonian Inst.* (U. S. Nat. Mus.), 1890 (1891), pp. 189-193.

VASEY, GEORGE. Report of the Botanist for 1892.

*Rep. Sec. Agric.*, 1892, pp. 201-214.

Principally an account of the office work, publications, and experiments carried on by the Division of Botany.

— Grasses of the Pacific Slope.

*Bull. Div. Bot.*, No. 13, U. S. Dept. Agric., Part I, October, 1892; Part II, June, 1893.

One hundred species of the principal grasses of the Pacific slope are described and figured.

— Report on the Department of Botany in the U. S. National Museum, 1890.

*Rep. Smithsonian Inst.* (U. S. Nat. Mus.), 1890 (1891), pp. 237-239.

VERRILL, A. E. The Marine Nemereteans of New England and adjacent waters. Dinophilidae of New England.

*Trans. Conn. Acad. Sci.*, VIII, June and December, 1892, pp. 1-30, 411-458, pls. XXXIII-XXXIX.

Based partly on material collected by the U. S. Fish Commission between 1871 and 1887, which will be added to the Museum collection. Two new genera are described, *Nectonemertes* and *Hyalonemertes*. The new species are *Amphiporus multisarvus*, *A. heterosorus*, *A. tetrasorus*, *A. frontalis*, *A. mesosorus*, *A. cæcus*, *Tetrastemma roseum*, *Lineus bicolor*, *Micruva dorsalis*, *M. rubra*, *Nectonemertes mirabilis*, *Hyalonemertes atlantica*. New varieties: *Tetrastemma vermiculus* var. *catenulatum* and *T. dorsale* var. *unicolor*.

WALCOTT, CHARLES DOOLITTLE. Notes on the Cambrian rocks of Virginia and the southern Appalachians.

*Am. Journ. Sci.*, XLIV, July, 1892, pp. 52-57.

This paper is an account of fieldwork on the Cambrian rocks of Virginia in the vicinity of Balcony Falls and of their southwestward extension across Tennessee and into Georgia. It records the study of a large Middle Cambrian fauna in Tennessee and the identification of a Lower Cambrian horizon in Virginia and Tennessee.

— The North American Continent during Cambrian time.

*12 Ann. Rep. U. S. Geol. Surv.*, 1890-'91 (1892), pp. 523-568, 3 maps, and 1 page of sections and figures.

This is a memoir on the condition and development of the North American Continent dur-

## WALCOTT, CHARLES D.—continued.

ing Middle Paleozoic time. It is accompanied by three maps, one of which illustrates the relative amount of sedimentation within the typical geologic provinces of North America during Cambrian time. The second is a hypothetical map of the continent at the beginning of Lower Cambrian time, and the third is one of the same character, representing the continent at the beginning of Lower Silurian (Ordovician) time. Several important conclusions were arrived at. Among them are:

1. The pre-Cambrian Algonkian continent was formed of the crystalline rocks of the Archean nuclei, and broad areas of superjacent Algonkian rocks that were more or less disturbed and extensively eroded in pre-Cambrian time. Its area was larger than at any succeeding epoch until Mesozoic time.
2. At the beginning of Cambrian time three principal areas of sedimentation existed: (a) The Atlantic coast province, including various seas between the several pre-Cambrian ridges; (b) a narrow sea extending along the western side of the Paleo-Appalachian range, from the present site of Labrador to Alabama; (c) a broader sea on the western side of the continent, west of the Paleo-Rocky Mountain ranges, that extended from the southern portion of the present site of Nevada northward into British Columbia and probably toward the Arctic Circle, and south to the Paleo-Gulf of Mexico, and thus connecting with the Paleo-Appalachian Sea.
3. The Cambrian age began to invade the great interior continental area in late Cambrian time, and extended far to the north toward the close of the period, as indicated on Pl. XLV.
4. The depression of the continent in relation to sea level began in pre-Cambrian time and continued with few interruptions until the close of Paleozoic time.
5. The relative positions of the continental area and the deep seas have not changed since Algonkian time.
6. The sediments of Cambrian time were accumulated to a great extent in approximately shallow seas, except in portions of the Paleo-Rocky Mountain and Paleo-Appalachian seas.
7. The lower Cambrian fauna lived in the seas of the Atlantic coast province, the Paleo-Appalachian and the Paleo-Rocky Mountain seas.
8. The Middle Cambrian fauna of the Atlantic basin is not known to have penetrated into the Paleo-Appalachian or Paleo-Rocky Mountain seas, except in the case of a few species now found in Alabama and probably eastern New York. The portion of the fauna occupying the same relative stratigraphic position in the group is essentially the same as the Paleo-Appalachian and Paleo-Rocky Mountain sections.
9. The Upper Cambrian fauna was distributed over the broad interior continental area and in the Paleo-Appalachian and Paleo-Rocky

## WALCOTT, CHARLES D.—continued.

Mountain seas, but it has not been recognized by the same genera and species in the Atlantic coast province, the fauna of the latter being more closely allied to that of the Upper Cambrian of the eastern side of the Atlantic basin.

## — Notes on the Cambrian rocks of Pennsylvania and Maryland, from the Susquehanna to the Potomac.

*Am. Journ. Sci.*, XLIV, 1892, pp. 469-482.

This paper is a continuation of the study of the Cambrian rocks of the Appalachian range north of Virginia, between the Potomac and the Susquehanna rivers. It records the discovery of the Middle Cambrian fauna in a series of quartzites that extend from Harpers Ferry on the Potomac to South Mountain in Pennsylvania, and which also occur in York County, Pa., on the Susquehanna. It was also discovered that a series of limestone shales several thousand feet in thickness belong to the Lower Cambrian series.

## — Report on the Department of Paleozoic Fossils in the U. S. National Museum, 1890.

*Rep. Smithsonian Inst. (U. S. Nat. Mus.)*, 1890 (1891), pp. 233-234.

## WARD, LESTER F. [Abstract of] The plant-bearing deposits of the American Trias.

*Proc. Am. Assoc. Adv. Sci.*, XL (Washington meeting), 1891, pp. 287-288.

Abstract of paper of same title published in *Bull. Geol. Soc. Am.*, III, 1891, pp. 23-31.

## — [Abstract of] Principles and methods of geologic correlation by means of fossil plants.

*Proc. Am. Assoc. Adv. Sci.*, XL (Washington meeting), 1891, pp. 288-289.

Abstract of paper of same title in *Am. Geologist*, IX, 1892, pp. 34-47.

## — [Abstract of] The science and art of Government.

*Proc. Am. Assoc. Adv. Sci.*, XL (Washington meeting), 1891, pp. 420-421.

A paper read in abstract before Section I (Economics and Statistics) of the American Association for the Advancement of Science, at its Washington meeting, in August, 1891. Published in *Science*, xviii, November 20, 1891, p. 281.

## — [Abstract of] A national university; its character and purpose.

*Proc. Am. Assoc. Adv. Sci.*, XL (Washington meeting), 1891, pp. 421-422.

A paper read in abstract before Section I (Economics and Statistics) of the American Association for the Advancement of Science, at

## WARD, LESTER F.—continued.

its Washington meeting, in August, 1891. Published in *Science*, XVIII, November 20, 1891, p. 281.

- Notice of "The Paleontology of the Cretaceous formation on Staten Island; by Arthur Hollick, New York, 1892," in *Trans. N. Y. Acad. Sci.*, Vol. XI, New York, 1892.

*Am. Journ. Sci.*, 3d series, XLIV, New Haven, September, 1892, p. 259.

- Notice of "Untersuchungen über fossile Hölzer Schwedens; von H. Conwentz;" in *Kongl. svenska Vetenskaps-Akademiens*, Bandet 24, No. 13.

*Am. Journ. Sci.*, 3d series, XLIV, New Haven, September, 1892, p. 260.

- [Review of] Weismann's new essays.

*Public Opinion*, XII, Washington and New York, September 10, 1892, p. 559.

Short review of Weismann's essays upon heredity and kindred biological problems, Vol. II. Authorized translation, Oxford, 1892. The second essay is criticized as embodying a *reductio ad absurdum*. The concluding essay on *Amphimixis* is highly commended.

- Notice of "Albirupean studies;" by P. R. Uhler; in *Trans. Md. Acad. Sci.*, 1892, pp. 185-201.

*Am. Journ. Sci.*, 3d series, XLIV, New Haven, October, 1892, pp. 333-334.

- Notice of "The fossil flora of the Bozeman coal field, by F. H. Knowlton;" in *Proc. Biol. Soc., Washington*, VII, Washington, July, 1892, pp. 153-154.

*Am. Journ. Sci.*, 3d series, XLIV, New Haven, October, 1892, p. 834.

- Notice of "Paléontologie Végétale (Ouvrages publiés en 1890) par R. Zeiller," from l'Annuaire Géologique Universel, VII, 1890, Paris, 1892, pp. 1115-1157.

*Am. Journ. Sci.*, 3d series, XLIV, New Haven, October, 1892, pp. 334-335.

- Notice of "Sylloge Fungorum Fossilium hucusque cognitorum; auctore A. Meschinelli. Patavii, 1892;" from Saccardo's Sylloge Fungorum, X.

*Am. Journ. Sci.*, 3d series, XLIV, New Haven, October, 1892, p. 335.

- Notice of "I Tronchi du Bennettitee dei Musei Italiani. Notizie storiche, geologiche, botaniche; dei Professori Senatore G. Capellini e Conte E. Solms-Laubach;" from serie V, tomo II, della

## WARD, LESTER F.—continued.

Mem. Real. Acad. Sci. Ist. di Bologna, Bologna, 1892.

*Am. Journ. Sci.*, 3d series, XLIV, New Haven, October, 1892, pp. 335-336.

- Notice of "Ueber den gegenwärtigen Standpunkt unserer Kenntniss von dem Vorkommen fossiler Glacialpflanzen; von A. G. Nathorst;" from the Bihang till svenska Vet.-Akad. Handlingar, Band 17, Afd. 111, No. 5, Stockholm, 1892.

*Am. Journ. Sci.*, 3d series, XLIV, New Haven, October, 1892, p. 336.

- The psychologic basis of social economics.

*Ann. Am. Acad. Political and Social Science*, III, Philadelphia, January, 1893, pp. 72-90.

The distinction is pointed out between what is described as animal or biologic and human or psychologic economy. The former is carefully formulated, explained, and illustrated, and it is shown that the current political economy as well as the individualistic philosophy of Herbert Spencer and his disciples is primarily founded upon it. Examples of the profligality of nature are given to show that it is not economical, and a sharp contrast is shown between nature's methods and those of rational man. The fundamental defect of all systems of economics is thus shown to be that they rest upon biology or the law of unregulated nature, instead of upon psychology or the law of mind. A true system of economics will be based upon the latter, which is antithetical to the former and is economical in the correct sense of the word.

- Nomenclature of the Rock Creek region.

*Am. Anthropologist*, VI, Washington, January, 1893, p. 45.

A list of the names furnished to the committee of the Anthropological Society appointed to suggest to the District Commissioners appropriate names for localities and objects in the District of Columbia. These names were given to the various streams, bluffs, ridges, and valleys on account of the discovery at or near these places of rare or interesting plants during many years of botanical exploration, which resulted in the publication of the Guide to the Flora of Washington and Vicinity. (*Bull. U. S. Nat. Mus.*, No. 22, 1881.) Some of them were either mentioned in the text of that work or recorded in the map accompanying it, but the greater part were taken from the author's unpublished notes.

- The psychologic basis of social economics.

*Proc. Am. Assoc. Adv. Sci.*, XLI, 1892; Salem, 1892, pp. 301-321.

## WARD, LESTER F.—continued.

Address of the Vice-President of Section 1, Economic Science and Statistics, delivered at Rochester, August 17, 1892. This paper is the same in substance as that published in the *Annals of the Academy of Political and Social Science* at Philadelphia, for January, 1893, except that in the latter certain paragraphs were omitted to reduce its length.

## — The new botany.

*Science*, XXI, New York, January 27, 1893, pp. 43-44.

A plea for the establishment of post-graduate chairs in the leading American universities for the study of botany from all points of view, especially from the paleontological side, for the working out of the phylogeny of plants in America.

— Notice of "Additions to the Paleobotany of the Cretaceous Formation on Staten Island, by Arthur Hollick;" in *Trans. N. Y. Acad. Sci.*, XIII, New York, 1892, pp. 1-12, pls. 1-IV.

*Am. Journ. Sci.*, 3d series, XLV, New Haven, May, 1893, p. 437.

— Notice of "The organization of the fossil plants of the coal measures, Part XIX, by W. C. Williamson;" in *Phil. Trans. Roy. Soc.*, London, CLXXXIV, B, 1893, pp. 1-38, pls. 1-IX.

*Am. Journ. Sci.*, 3d series, XLV, New Haven, May, 1893, pp. 437-438.

## — Notice of "Fossil plants as tests of climate," by A. C. Seward. London, 1892.

*Am. Journ. Sci.*, 3d series, XLV, New Haven, May, 1893, p. 438.

## — Notice of "Flora Tertiaria Italica; auctoribus A. Meschinelli et X. Squinabol." Patavii, 1893.

*Am. Journ. Sci.*, 3d series, XLV, New Haven, May, 1893, pp. 438-439.

— Notice of "The correlation of early Cretaceous floras in Canada and the United States," by Sir William Dawson; in *Trans. Roy. Soc. Canada*, X, Section IV, pp. 79-93.

*Am. Journ. Sci.*, 3d series, XLV, New Haven, May, 1893, p. 439.

— Notice of "A new Taniopteroid fern and its allies," by David White, in *Bull. Geol. Soc. Am.*, IV, 1893, pp. 119-132, pl. 1.

*Am. Journ. Sci.*, 3d series, XLV, New Haven, May, 1893, pp. 439-440.

## WARD, LESTER F. Frost freaks of the Dittany.

*Botan. Gaz.*, XVII, Bloomington, Ind., May, 1893, pp. 183-186, pl. XIX.

Describes remarkable forms of frost crystals observed on plants of *Cunila mariana*, December 5, 1892, near Accotink, Va., with illustrations.

## — Dr. Newberry's work in Paleobotany.

*Trans. N. Y. Acad. Sci.*, XII, New York, May, 1893, pp. 162-163

Abstracted from a letter to Prof. H. L. Fairchild, dated 1893. Embodied in a memoir of Prof. John Strong Newberry, by Herman LeRoy Fairchild.

## — Note on fossil Cycads from South Dakota.

*Science*, XXI, New York, June 30, 1893, p. 355.

Brief account of a collection of six fossil cycadean trunks, purchased by the U. S. National Museum from owners near Hot Springs, S. Dak., who found them on the surface of the ground, overgrown with lichens. They were very large, and exhibit certain peculiar and remarkable features.

## — Discussion of a paper by Dr. E. A. Ross, entitled "A New Canon of Taxation," read, August 24, 1892, at Chattanooga, N. Y.

*Publications of the American Economical Association*, VIII, No. 1, 1893, pp. 50-51.

Part of report of the Proc. Am. Economic Assoc. Fifth meeting.

Emphasizes the importance of considering the social as well as the fiscal effect of a tax, and of giving to laws an attractive character, whereby the person taxed will be induced through interest to act for the good of society.

WATKINS, JOSEPH ELFRETH. The log of the *Sarannah*.

*Rep. Smithsonian Inst.* (U. S. Nat. Mus.), 1890 (1891), pp. 611-639, pls. CLI-CLVI.

## — (Editor). Proceedings and Addresses. | Celebration | of the | Beginning | of the | Second Century | of the | American Patent System | at Washington City, D. C., | April 8, 9, and 10, 1891. | Published by the Executive Committee | Washington, D. C.:—Press of Gedney &amp; Roberts Co. | 1892.

8 vo., pp. 1-v (1) 1-554.

## — Catalogue of the exhibit of the Pennsylvania Railroad Company at the World's Columbian Exposition. pp. 1-158.

WATKINS, J. ELFRETH—continued.

— Report on the Section of Transportation and Engineering in the U. S. National Museum, 1890.

*Rep. Smithsonian Inst.* (U. S. Nat. Mus.), 1890 (1891), pp. 159-162.

WHITE, CHARLES ABLATHAR. Report on the Department of Mesozoic Fossils in the U. S. National Museum, 1890.

*Rep. Smithsonian Inst.* (U. S. Nat. Mus.), 1890 (1891), pp. 235-236.

WILLIAMSON, Mrs. M. BURTON. An annotated list of the shells of San Pedro Bay and vicinity, with a description of two new species by W. H. Dall.

*Proc. U. S. Nat. Mus.*, xv, No. 898, August 4, 1892, pp. 179-219, pls. XIX-XXII.

This paper comprises a list prepared by Mrs. Williamson, with notes on the species from various collectors. *Vitrinella Williamsoni*, *Ocula barbarensis*, *Amphissa bicolor* are described by Mr. Dall as new, and many species of the region are figured for the first time. Based partly upon Museum material.

WILSON, THOMAS. [Anthropological notes in the *American Naturalist*.] Man and the Mylodon. No. 407, July, 1892, pp. 629-631. Importance of the science and of the department of prehistoric anthropology. No. 308, August, 1892, pp. 681-690; No. 310, October, 1892, pp. 809-816. International Congress of Americanists. No. 315, March, 1893, pp. 300-305; No. 318, June, 1893, pp. 579-581. Language *v.* anatomy in de-

WILSON, THOMAS—continued.

termining human races. No. 318, June, 1893, pp. 581-582. The Nephrite of New Zealand. No. 318, June, 1893, pp. 582-583.

— Ancient Etruria.

*Am. Antiquarian*, xv, No. 1, pp. 25-32.

— Anthropology at the Paris Exposition in 1889.

*Rep. Smithsonian Inst.* (U. S. Nat. Mus.), 1890 (1891), pp. 641-680, pls. CLVII-CLXIII, fig. 99.

— Report on the Department of Prehistoric Anthropology in the U. S. National Museum, 1890.

*Rep. Smithsonian Inst.* (U. S. Nat. Mus.), 1890 (1891), pp. 179-187.

WOOLMAN, ALBERT J. Report of an examination of the rivers of Kentucky, with list of fishes obtained.

*Bull. U. S. Fish. Com.*, 1890, pp. 249-283. This paper is based in part upon Museum material.

— A report upon the rivers of central Florida, tributary to the Gulf of Mexico, with list of the fishes inhabiting them.

*Bull. U. S. Fish. Com.*, 1890, pp. 293-302.

WORTH, JOUN. The lives and loves of North American birds.

*Nineteenth Century*, April, 1893, pp. 586-605.

A review of *Special Bulletin* No. 1, of the U. S. National Museum, entitled "Life Histories of North American Birds," by Capt. Charles Bendire.

## APPENDIX VIII.

### LECTURES AND MEETINGS OF SOCIETIES.

The course of Saturday lectures for the season of 1892-'93 was as follows:

- March 25.—The Human Body. By Dr. D. S. Lamb.  
April 1.—The Anthropology of the Brain. By Dr. D. Kertoot Slute.  
April 8.—Status of the Mind Problem. By Prof. Lester F. Ward.  
April 15.—The Elements of Psychology. By Maj. J. W. Powell.  
April 22.—The Evolution of Inventions. By Prof. Otis T. Mason.  
April 29.—The Races of Men. By Dr. Daniel G. Brinton.  
May 6.—The Earth, the Home of Man. By W. J. McGee.  
May 13.—Primitive Industries. By Dr. Thomas Wilson.

At the meeting of the American Ornithologists' Union, which was held from November 15 to November 17, 1892, the following papers were presented:

1. Birds of Lewis and Clarke in 1892. By Dr. Elliott Coues.
2. Summer Birds of Indiana and Clearfield Counties, Pennsylvania. By W. E. Clyde Todd.
3. The Geographical Distribution of the Genus *Megascops* in North America. By E. M. Hasbrouck.
4. Summer Birds of Prince Edward Island. By Jonathan Dwight, jr.
5. A Partial List of the Birds of White Head Island, Maine. By Arthur H. Norton.
6. The Origin and Geographical Distribution of North American Birds. By Dr. J. A. Allen.
7. The Life Areas of North America, considered especially in relation to their Classification and Nomenclature. By Dr. J. A. Allen.
8. The Fly-catchers of the *Myiarchus mexicanus* and *M. cinerascens* groups. By Dr. J. A. Allen.
9. Notes on Birds observed in Cuba. By Frank M. Chapman.
10. Remarks on the origin of West Indian Bird-life. By Frank M. Chapman.
11. A Review of the Faunal Literature of North America. By Frank M. Chapman.
12. Some Eccentricities in Geographical Distribution. By D. G. Elliot.
13. Habits of the Knot (*Tringa canutus*) in Massachusetts. By George H. Mackay.
14. Migration of *Charadrius dominicus* in Massachusetts in 1892. By George H. Mackay.
15. The Autumnal Plumage of the Hooded Warbler. By William Palmer.
16. Food-habits of the Common Crow. By Walter B. Barrows.
17. A Preliminary investigation of the Food-habits of *Ampelis cedrorum*. By F. E. L. Beal.
18. Notes on *Helminthophila chrysoptera*, *pinus*, *leucobronchialis*, and *lawrencei* in Connecticut. By John H. Sage.
19. Additions to the List of Manitoban Birds. By Ernest E. Thompson.
20. Feeding and Breeding habits of the Manitoban Icteridae. By Ernest E. Thompson.



21. Feeding-habits of the Pinewood Woodpeckers. By Ernest E. Thompson.
22. The Distribution of the Genus *Harporhynchus*. By T. S. Palmer.
23. Exhibition of specimens of the Imperial Woodpecker. By T. S. Palmer.

The papers read before the National Academy of Sciences, at its annual meeting in April, 1893, are indicated below :

- I. On the Systematic Relations of the Ophidia. By Prof. E. D. Cope.
- II. Biographical Memoir of Gen. Montgomery C. Meigs. By H. L. Abbott.
- III. On the Nature of Certain Solutions, and on a new means of investigating them. By M. C. Lea.
- IV. The Relations of Allied Branches of Biological Research to the Study of the Development of the Individual, and the Evolution of Groups. By Prof. A. Hyatt.
- V. The Endosiphonoidea (Endoceras, etc.), considered as a new order of Cephalopods. By Prof. A. Hyatt.
- VI. A New Type of Fossil Cephalopods. By Prof. A. Hyatt.
- VII. Results of Recent Researches upon Fossil Cephalopods of the Carboniferous. By Prof. A. Hyatt.
- VIII. Biographical Memoir of Julius Erasmus Hilgard. By Prof. E. W. Hilgard.
- IX. Monograph of the Bombycine Moths of America, North of Mexico: Part I—Notodontidæ. By Dr. A. S. Packard.
- X. Intermediary Orbits. By G. W. Hill.
- XI. The Relations between the Statistics of Immigration and the Census Returns of the Foreign-born Population of the United States. By Richmond Mayo-Smith.
- XII. Statistical Data for the Study of the Assimilation of Races and Nationalities in the United States. By Richmond Mayo-Smith.
- XIII. Telegraphic Gravity Determinations. By Dr. T. C. Mendenhall.
- XIV. Comparison of Latitude Determinations at Waikiki. By Dr. T. C. Mendenhall.
- XV. A One-volt Standard Cell. By H. S. Carhart.
- XVI. Fundamental Standards of Length and Mass. By Dr. T. C. Mendenhall.
- XVII. Peptonization in Gastric Digestion. By R. A. Chittenden.

## APPENDIX IX.

### DOCUMENTS RELATING TO THE WORLD'S COLUMBIAN EXPOSITION.

AN ACT to provide for celebrating the four hundredth anniversary of the discovery of America by Christopher Columbus by holding an international exhibition of arts, industries, manufactures, and the products of the soil, mine, and sea in the city of Chicago, in the State of Illinois.

Whereas, it is fit and appropriate that the four hundredth anniversary of the discovery of America be commemorated by an exhibition of the resources of the United States of America, their development, and of the progress of civilization in the New World; and

Whereas, Such an exhibition should be of a national and international character, so that not only the people of our Union and this continent, but those of all nations as well, can participate, and should therefore have the sanction of the Congress of the United States: Therefore,

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,* That an exhibition of arts, industries, manufactures, and products of the soil, mine, and sea shall be inaugurated in the year eighteen hundred and ninety-two, in the city of Chicago, in the State of Illinois, as hereinafter provided.

SEC. 2. That a commission, to consist of two commissioners from each State and Territory of the United States and from the District of Columbia and eight commissioners at large, is hereby constituted to be designated as the World's Columbian Commission.

SEC. 3. That said commissioners, two from each State and Territory, shall be appointed within thirty days from the passage of this act by the President of the United States, on the nomination of the governors of the States and Territories, respectively, and by the President eight commissioners at large and two from the District of Columbia; and in the same manner and within the same time there shall be appointed two alternate commissioners from each State and Territory of the United States and the District of Columbia and eight alternate commissioners at large, who shall assume and perform the duties of such commissioner or commissioners as may be unable to attend the meetings of the said commission; and in such nominations and appointments each of the two leading political parties shall be equally represented. Vacancies in the commission nominated by the governors of the several States and Territories, respectively, and also vacancies in the commission at large and from the District of Columbia may be filled in the same manner and under the same conditions as provided herein for their original appointment.

SEC. 4. That the Secretary of State of the United States shall, immediately after the passage of this act, notify the governors of the several States and Territories, respectively, thereof and request such nominations to be made. The commissioners so appointed shall be called together by the Secretary of State of the United States in the city of Chicago, by notice to the commissioners, as soon as convenient after the appointment of said commissioners, and within thirty days thereafter. The said commissioners, at said first meeting, shall organize by the election of such officers and the appointment of such committees as they may deem expedient, and for this purpose the commissioners present at said meeting shall constitute a quorum.

SEC. 5. That said commission be empowered in its discretion to accept for the purposes of the World's Columbian Exposition such site as may be selected and offered and such plans and specifications of buildings to be erected for such purpose at the expense of and tendered by the corporation organized under the laws of the State of Illinois, known as "The World's Exposition of Eighteen hundred and ninety-two:" *Provided*, That said site so tendered and the buildings proposed to be erected thereon shall be deemed by said commission adequate to the purposes of said exposition: *And provided*, That said commission shall be satisfied that the said corporation has an actual bona fide and valid subscription to its capital stock which will secure the payment of at least five millions of dollars, of which not less than five hundred thousand dollars shall have been paid in, and that the further sum of five million dollars, making in all ten million dollars, will be provided by said corporation in ample time for its needful use during the prosecution of the work for the complete preparation for said exposition.

SEC. 6. That the said commission shall allot space for exhibitors, prepare a classification of exhibits, determine the plan and scope of the exposition, and shall appoint all judges and examiners for the exposition, award all premiums, if any, and generally have charge of all intercourse with the exhibitors and the representatives of foreign nations. And said commission is authorized and required to appoint a board of lady managers of such number and to perform such duties as may be prescribed by said commission. Said board may appoint one or more members of all committees authorized to award prizes for exhibits, which may be produced in whole or in part by female labor.

SEC. 7. That after the plans for said exposition shall be prepared by said corporation and approved by said commission, the rules and regulations of said corporation governing rates for entrance and admission fees, or otherwise affecting the rights, privileges, or interests of the exhibitors or of the public, shall be fixed or established by said corporation, subject, however, to such modification, if any, as may be imposed by a majority of said commissioners.

SEC. 8. That the President is hereby empowered and directed to hold a naval review in New York Harbor, in April, eighteen hundred and ninety-three, and to extend to foreign nations an invitation to send ships of war to join the United States Navy in rendezvous at Hampton Roads and proceed thence to said review.

SEC. 9. That said commission shall provide for the dedication of the buildings of the World's Columbian Exposition in said city of Chicago on the twelfth day of October, eighteen hundred and ninety-two, with appropriate ceremonies, and said exposition shall be open to visitors not later than the first day of May, eighteen hundred and ninety-three, and shall be closed at such time as the commission may determine, but not later than the thirtieth day of October thereafter.

SEC. 10. That whenever the President of the United States shall be notified by the commission that provision has been made for grounds and buildings for the uses herein provided for and there has also been filed with him by the said corporation, known as "The World's Exposition of eighteen hundred and ninety-two," satisfactory proof that a sum not less than ten million dollars, to be used and expended for the purposes of the exposition herein authorized, has in fact been raised or provided for by subscription or other legally binding means, he shall be authorized, through the Department of State, to make proclamation of the same, setting forth the time at which the exposition will open and close, and the place at which it will be held; and he shall communicate to the diplomatic representatives of foreign nations copies of the same, together with such regulations as may be adopted by the commission, for publication in their respective countries, and he shall, in behalf of the Government and people, invite foreign nations to take part in the said exposition and appoint representatives thereto.

SEC. 11. That all articles which shall be imported from foreign countries for the sole purpose of exhibition at said exposition, upon which there shall be a tariff or

customs duty, shall be admitted free of payment of duty, customs fees, or charges under such regulations as the Secretary of the Treasury shall prescribe; but it shall be lawful at any time during the exhibition to sell for delivery at the close of the exposition any goods or property imported for and actually on exhibition in the exposition buildings or on its grounds, subject to such regulations for the security of the revenue and for the collection of the import duties as the Secretary of the Treasury shall prescribe: *Provided*, That all such articles when sold or withdrawn for consumption in the United States shall be subject to the duty, if any, imposed upon such articles by the revenue laws in force at the date of importation, and all penalties prescribed by law shall be applied and enforced against such articles, and against the persons who may be guilty of any illegal sale or withdrawal.

SEC. 12. That the sum of twenty thousand dollars, or as much thereof as may be necessary, be, and the same is hereby, appropriated, out of any moneys in the Treasury not otherwise appropriated, for the remainder of the present fiscal year and for the fiscal year ending June thirtieth, eighteen hundred and ninety-one, to be expended under the direction of the Secretary of the Treasury for purposes connected with the admission of foreign goods to said exhibition.

SEC. 13. That it shall be the duty of the commission to make report from time to time, to the President of the United States of the progress of the work, and, in a final report, present a full exhibit of the results of the exposition.

SEC. 14. That the commission hereby authorized shall exist no longer than until the first day of January, eighteen hundred and ninety-eight.

SEC. 15. That the United States shall not in any manner, nor under any circumstances, be liable for any of the acts, doings, proceedings or representations of the said corporation organized under the laws of the State of Illinois, its officers, agents, servants, or employes, or any of them, or for the service, salaries, labor, or wages of said officers, agents, servants, or employes, or any of them, or for any subscriptions to the capital stock, or for any certificates of stock, bonds, mortgages, or obligations of any kind issued by said corporation or for any debts, liabilities, or expenses of any kind whatever attending such corporation or accruing by reason of the same.

SEC. 16. That there shall be exhibited at said exposition by the Government of the United States, from its Executive Departments, the Smithsonian Institution, the United States Fish Commission, and the National Museum, such articles and materials as illustrate the function and administrative faculty of the Government in time of peace and its resources as a war power, tending to demonstrate the nature of our institutions and their adaptation to the wants of the people; and to secure a complete and harmonious arrangement of such a Government exhibit, a board shall be created to be charged with the selection, preparation, arrangement, safe-keeping, and exhibition of such articles and materials as the heads of the several Departments and the directors of the Smithsonian Institution and National Museum may respectively decide shall be embraced in said Government exhibit. The President may also designate additional articles for exhibition. Such board shall be composed of one person to be named by the head of each Executive Department, and one by the directors of the Smithsonian Institution and National Museum, and one by the Fish Commission, such selections to be approved by the President of the United States. The President shall name the chairman of said board, and the board itself shall select such other officers as it may deem necessary.

That the Secretary of the Treasury is hereby authorized and directed to place on exhibition, upon such grounds as shall be allotted for the purpose, one of the life-saving stations authorized to be constructed on the coast of the United States by existing law, and to cause the same to be fully equipped with all apparatus, furniture, and appliances now in use in all life-saving stations in the United States, said building and apparatus to be removed at the close of the exhibition and re-erected at the place now authorized by law.

SEC. 17. That the Secretary of the Treasury shall cause a suitable building or buildings to be erected on the site selected for the World's Columbian Exposition for the Government exhibits, as provided in this act, and he is hereby authorized and directed to contract therefor, in the same manner and under the same regulations as for other public buildings of the United States; but the contracts for said building or buildings shall not exceed the sum of four hundred thousand dollars, and for the remainder of the fiscal year and for the fiscal year ending June thirtieth, eighteen hundred and ninety one, there is hereby appropriated for said building or buildings, out of any money in the Treasury not otherwise appropriated, the sum of one hundred thousand dollars. The Secretary of the Treasury shall cause the said building or buildings to be constructed as far as possible, of iron, steel, and glass, or of such other material as may be taken out and sold to the best advantage; and he is authorized and required to dispose of such building or buildings, or the material composing the same, at the close of the exposition, giving preference to the city of Chicago, or to the said World's Exposition of eighteen hundred and ninety-two to purchase the same at an appraised value to be ascertained in such manner as he may determine.

SEC. 18. That for the purpose of paying the expenses of transportation, care, and custody of exhibits by the Government and the maintenance of the building or buildings hereinbefore provided for, and the safe return of articles belonging to the said Government exhibit, and for the expenses of the commission created by this act, and other contingent expenses, to be approved by the Secretary of the Treasury, upon itemized accounts and vouchers, there is hereby appropriated for the remainder of this fiscal year and for the fiscal year ending June thirtieth, eighteen hundred and ninety-one, out of any money in the Treasury not otherwise appropriated, the sum of two hundred thousand dollars, or so much thereof as may be necessary: *Provided*, That the United States shall not be liable, on account of the erection of buildings, expenses of the commission or any of its officers or employees, or on account of any expenses incident to or growing out of said exposition for a sum exceeding in the aggregate one million five hundred thousand dollars.

SEC. 19. That the commissioners and alternate commissioners appointed under this act shall not be entitled to any compensation for their services out of the Treasury of the United States, except their actual expenses for transportation and the sum of six dollars per day for subsistence for each day they are necessarily absent from their homes on the business of said commission. The officers of said commission shall receive such compensation as may be fixed by said commission, subject to the approval of the Secretary of the Treasury, which shall be paid out of the sums appropriated by Congress in aid of such exposition.

SEC. 20. That nothing in this act shall be so construed as to create any liability of the United States, direct or indirect, for any debt or obligation incurred, nor for any claim for aid or pecuniary assistance from Congress or the Treasury of the United States in support or liquidation of any debts or obligations created by said commission in excess of appropriations made by Congress therefor.

SEC. 21. That nothing in this act shall be so construed as to override or interfere with the laws of any State, and all contracts made in any State for the purposes of the exhibition shall be subject to the laws thereof.

SEC. 22. That no member of said commission, whether an officer or otherwise, shall be personally liable for any debt or obligation which may be created or incurred by the said commission.

(Public—No. 81.) Approved, April 25, 1890.

JOINT RESOLUTION authorizing the Secretary of the Smithsonian Institution to send articles illustrative of the life and development of the industries of women to the World's Columbian Exposition.

*Resolved by the Senate and House of Representatives of the United States of America in Congress assembled.* That the Secretary of the Smithsonian Institution be, and he hereby is, authorized to prepare and send, for exhibition in the Woman's Building of the World's Columbian Exposition, any article now in his custody, or on exhibition in the National Museum, illustrative of the life and development of the industries of women.

(Public resolution—No. 17.) Approved, March 3, 1893.

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WORLD'S COLUMBIAN EXPOSITION.

GOVERNMENT EXHIBIT: For the selection, purchase, preparation, transportation, installation, care and custody, and return of such articles and materials as the heads of the several Executive Departments, the Smithsonian Institution and National Museum, and the United States Fish Commission may decide shall be embraced in the Government exhibit, and such additional articles as the President may designate for said Exposition, and for the employment of proper persons as officers and assistants to the Board of Control and Management of the Government exhibit, appointed by the President, of which not exceeding ten thousand dollars may be expended by said Board for clerical services one hundred and fifty thousand seven hundred and fifty dollars; of which sum fifty thousand dollars shall be immediately available, *Provided*, That the sum of eight thousand dollars or so much thereof as may be necessary, may be expended under the supervision of the board of Control of the United States Government exhibit in the collection, preparation, packing, transportation, installation, and care while exhibited of articles loaned or donated by the colleges of agriculture and mechanic arts in the several States for the display in the agricultural building of the Exposition, of the means and methods of giving instruction in the so-called land-grant college of the United States, and for re-packing and returning this property at the close of the Exposition, the same to be taken from the sum apportioned to the Agricultural Department; and ten thousand dollars additional for special expenses attending the naval exhibit of the model of a battle ship.

WORLD'S COLUMBIAN COMMISSION: For the World's Columbian Commission, two hundred and eleven thousand three hundred and seventy-five dollars, of which sum ninety-three thousand one hundred and ninety dollars shall be used for the Board of Lady Managers; and twenty-five thousand dollars of the last sum is hereby made immediately available; and ten thousand dollars of the appropriation for the Board of Lady Managers shall be paid in souvenir coins of the denomination of twenty-five cents, and for that purpose there shall be coined at the mints of the United States silver quarter dollars of the legal weight and fineness, not to exceed forty thousand pieces, the devices and designs upon which shall be prescribed by the Director of the Mint, with the approval of the Secretary of the Treasury; and said silver coins shall be manufactured from uncurrent subsidiary silver coins now in the Treasury; and all provisions of law relative to the coinage, legal-tender quality, and redemption of the present subsidiary silver coins shall be applicable to the coins herein authorized to be issued; and a sum not exceeding five thousand dollars may be used by the Director-General in his discretion for incidental and contingent expenses of his office.

To enable said Commission and the Board of Lady Managers to give effect to and execute the provisions of section six of the act of Congress approved April twenty-fifth, eighteen hundred and ninety, authorizing the World's Columbian Exposition, and appropriating money therefor, relating to committees, judges, and examiners for the Exposition, and the granting of awards, five hundred and seventy thousand

eight hundred and eighty dollars, or so much thereof as in the judgment of the Lady Managers may be necessary, of which sum twenty-five thousand dollars shall be immediately available: *Provided*, That of this sum one hundred thousand dollars shall be devoted to the payment of judges, examiners, and members of committees to be appointed by the Board of Lady Managers, as authorized by said section. *And Provided further*, That said sum of five hundred and seventy thousand eight hundred and eighty dollars shall be a charge against the World's Columbian Exposition, and that of the moneys appropriated for the benefit of the World's Columbian Exposition, amounting to two million five hundred thousand dollars, under the act of August fifth, eighteen hundred and ninety-two, five hundred and seventy thousand eight hundred and eighty dollars shall be retained by the Secretary of the Treasury until said World's Columbian Exposition shall have furnished to the satisfaction of the Secretary of the Treasury, full and adequate security for the return and repayment, by said World's Columbian Exposition to the Treasury, of the sum of five hundred and seventy thousand eight hundred and eighty dollars, on or before October first, eighteen hundred and ninety-three; and until such security shall have been furnished by said World's Columbian Exposition, this appropriation, or any portion thereof, shall not be available.

That section three of the act in aid of the Columbian Exposition, approved August fifth, eighteen hundred and ninety-two, is hereby amended to read as follows:

“SEC. 3. That not to exceed fifty thousand bronze medals and the necessary dies therefor, with appropriate devices, emblems and inscriptions commemorative of the said Exposition celebrating the four hundredth anniversary of the discovery of America by Christopher Columbus, shall be prepared under the supervision of the Secretary of the Treasury; and the Bureau of Engraving and Printing, under the supervision of the Secretary of the Treasury, shall prepare plates and make therefrom not to exceed fifty thousand impressions for diplomas at a total cost not to exceed one hundred and three thousand dollars. Said medals and diplomas shall be delivered to the World's Columbian Commission, to be awarded to exhibitors in accordance with the provisions of said act of Congress approved April twenty-fifth, eighteen hundred and ninety, and there is hereby appropriated from any moneys in the Treasury not otherwise appropriated, the sum of one hundred and three thousand dollars, or so much thereof as may be necessary, to pay the expenditures authorized by this section”

And every person who within the United States or any Territory thereof, without lawful authority, makes, or willingly aids or assists in making, or causes or procures to be made, any dies, hub, plate, or mold, either in steel or of plaster, or any other substance whatsoever, in the likeness or similitude as to the design, or inscription thereon, of any die, hub, plate, or mold, designated for the striking of the medals and diplomas of award for the World's Columbian Exposition, as provided in section three of the act approved August fifth, eighteen hundred and ninety-two, or conceals or shall have in his possession, any such die, hub, plate, or mold hereinbefore mentioned, with intent to fraudulently or unlawfully use the same for counterfeiting the medals and diplomas hereinbefore mentioned, or who shall fraudulently or unlawfully have in his possession or cause to be circulated any duplicate or counterfeit medal or diploma not authorized by the Secretary of the Treasury, shall upon conviction thereof be punished by a fine of not more than five thousand dollars, and be imprisoned at hard labor not more than ten years or both, at the discretion of the court.

(Public—No. 124.) Sundry Civil Act Approved March 3, 1893.

## WORLD'S COLUMBIAN EXPOSITION.

GOVERNMENT EXHIBIT: For the selection, purchase, preparation, and arrangement of such articles and materials as the heads of the several Executive Departments, the Smithsonian Institution and National Museum, and the United States Fish Commission may decide shall be embraced in the Government exhibit, and such additional articles as the President may designate for said Exposition, and for the employment of proper persons as officers and assistants to the Board of Control and Management of the Government exhibit, appointed by the President, of which not exceeding five thousand dollars may be expended, by the said Board for clerical services the sum of three hundred and fifty thousand dollars is hereby appropriated for the service of the fiscal year ending June thirtieth, eighteen hundred and ninety-two; and any moneys heretofore appropriated in aid of said Government exhibit may be used in like manner and for like purposes: *Provided*, That all expenditures made for the purposes and from the appropriation specified herein shall be subject to the approval of the said Board of Control and Management, and of the Secretary of the Treasury, as now provided by law.

WORLD'S COLUMBIAN COMMISSION: For the World's Columbian Commission, ninety-five thousand five hundred dollars, of which sum thirty-six thousand dollars shall be used for the Board of Lady Managers.

For expenses connected with the admission of foreign goods to the Exposition, as set forth in section twelve of the act creating the Commission, approved April twenty-fifth, eighteen hundred and ninety, twenty thousand dollars;

For contingent expenses of the World's Congress Auxiliary of the World's Columbian Exposition, two thousand five hundred dollars.

And the several sums herein appropriated for the World's Columbian Exposition shall be deemed a part of the sum of one million five hundred thousand dollars, the limit of liability of the United States on account thereof fixed by the act of April twenty-fifth, eighteen hundred and ninety, authorizing said Exposition.

(Public—No. 143.) From Sundry Civil Act. Approved March 3, 1891.

## WORLD'S COLUMBIAN EXPOSITION.

GOVERNMENT EXHIBIT: For the selection, purchase, preparation, transportation, installation, care and custody, and arrangement of such articles and materials as the heads of the several Executive Departments, the Smithsonian Institution, and National Museum, and the United States Fish Commission may decide shall be embraced in the Government exhibit, and such additional articles as the President may designate for said Exposition, and for the employment of proper persons as officers and assistants to the Board of Control and Management of the Government exhibit, appointed by the President, of which not exceeding five thousand dollars may be expended by said Board for clerical services, four hundred and eight thousand two hundred and fifty dollars: *Provided*, That all expenditures for the purposes and from the appropriation specified herein shall be subject to the approval of the said Board of Control and Management and of the Secretary of the Treasury, as now provided by law.

WORLD'S COLUMBIAN COMMISSION: For the World's Columbian Commission, two hundred and thirty thousand dollars of which sum one hundred and ten thousand dollars shall be used for the Board of Lady Managers: *Provided*, That all expense of administration and installation in the Woman's building shall be paid by the World's Columbian Exposition: *Provided* That the salaries of the Director-General and Secretary of the Commission shall not exceed eight thousand dollars and three thousand dollars respectively per annum, and a sum not exceeding five thousand dollars may be used by the Director-General in his discretion for incidental and contingent



expenses of his office, and there shall not be more than two meetings of the World's Columbian Commission or of the Board of Lady Managers during the fiscal year eighteen hundred and ninety-three.

And the sums herein appropriated for the World's Columbian Exposition shall be in full of the liability of the United States on account thereof: *Provided*, That the Government Exhibits at the World's Columbian Exposition shall not be opened to the public on Sundays.

That the Secretary of War be, and he hereby is, authorized at his discretion to detail for special duty in connection with the World's Columbian Exposition, such officers of the Army as may be required, to report to the general commanding the Department of the Missouri, and the officers thus detailed shall not be subject to loss of pay or rank on account of such detail, nor shall any officer or employee of the United States receive additional pay or compensation because of service connected with said Exposition from the United States or from said Exposition.

(Public—No. 202.) From Sundry Civil Act. Approved August 5, 1892.

## APPENDIX X.

### DOCUMENTS IN RELATION TO THE COLUMBIAN HISTORICAL EXHIBITION IN MADRID, 1892.

No. 1.

#### ACT OF CONGRESS PROVIDING FOR THE REPRESENTATION OF THE UNITED STATES AT THE COMMEMORATION OF THE FOURTH CENTURY OF THE DISCOVERY OF AMERICA.

[PUBLIC—No. 62.]

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,* That the following sums, or so much thereof as may be necessary, be, and the same are hereby, appropriated, out of any money in the Treasury not otherwise appropriated, for the objects hereinafter expressed, for the service of the fiscal year eighteen hundred and ninety-two, namely:

COLUMBIAN HISTORICAL EXPOSITION AT MADRID: For the expense of representation of the United States at the Columbian Historical Exposition to be held in Madrid in eighteen hundred and ninety-two in commemoration of the four hundredth anniversary of the discovery of America, fifteen thousand dollars, or so much thereof as may be necessary, to be expended under the direction and in the discretion of the Secretary of State; and the President is hereby authorized to appoint a commissioner-general and two assistant commissioners, who may, in his discretion, be selected from the active or retired list of the Army or Navy, and shall serve without other compensation than that to which they are now entitled by law, to represent the United States at said exposition; that it shall be the duty of such commissioners to select from the archives of the United States, from the National Museum, and from the various Executive Departments of the Government such pictures, books, papers, documents, and other articles as may relate to the discovery and early settlement of America and the aboriginal inhabitants thereof; and they shall be authorized to secure the loan of similar articles from other museums and private collections, and arrange, classify, and install them as the exhibit of the United States at the said exposition; that the President is authorized to cause the detail of officers from the active or retired list of the Army and Navy, to serve without compensation other than that to which they are now entitled by law, as assistants to said commissioners; and the said commissioners shall be authorized to employ such clerical and other assistance as may be necessary, subject to the approval of the Secretary of State.

Approved May 13, 1892.

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In the Sundry Civil appropriation bill, approved August 5, 1892, an appropriation was made in the following words:

COLUMBIAN HISTORICAL EXPOSITION AT MADRID: For expenses of representation of the United States at said exposition, ten thousand dollars.

DECREE OF THE QUEEN REGENT OF SPAIN CONCERNING THE COMMEMORATION OF THE FOURTH CENTURY OF THE DISCOVERY OF AMERICA.

Atendiendo á las razones que Me ha expuesto el Presidente del Consejo de Ministros;

En nombre de Mi Augusto Hijo el Rey D. Alfonso XIII, y como Reina Regente del Reino,

Veugo en decretar lo siguiente:

ARTICULO 1. La Comisión nombrada por el segundo de los Reales decretos de 28 de Febrero de 1888, con ocasión de los festejos acordados por el Gobierno para conmemorar el cuarto Centenario del descubrimiento del Nuevo Mundo, y de la cual forman parte las más altas representaciones del Estado, continuará funcionando como hasta aquí, y poniendo por obra las resoluciones que haya adoptado ya, ó que en lo sucesivo adopte.

ART. 2. Habrá, por separado, en adelante, una Junta directiva del Centenario, compuesta de los tres individuos del Gobierno que más eficazmente puedan intervenir en su celebración, de varios miembros de la Comisión referida, y de las personas que se designarán después, la cual ha de atender, en primer término, á la ejecución de los proyectos que dieron especial materia al primero de los decretos antes citados, ejecución encargada entonces á los Ministros de Estado, Guerra y Ultramar. Al propio tiempo servirá de vínculo esta Junta entre el Gobierno en su conjunto, la Comisión ya existente, y cuantas Corporaciones ó Sociedades coadyuven voluntariamente al mayor lustre del Centenario.

ART. 3. La Exposición de objetos americanos de que trata el art. 2.º del referido primer decreto, no se extenderá ya á aquellos que en la actualidad caracterizan la cultura de los pueblos de América, ni á otros ningunos de la misma región que sean de posterior fecha á la mitad del siglo XVI. Limitarése, por tanto, ahora á presentar de la manera más completa que sea posible, según preceptuaba la prierá parte de dicho art. 2.º, el estado en que se hallaban por los días del descubrimiento, y de las principales conquistas europeas, los pobladores de América, agrupando al efecto cuantos objetos concurren á dar idea del origen y progreso de su relativa cultura.

ART. 4. Todo lo demás dispuesto por virtud del artículo que lleva este mismo número en el primer decreto mencionado permanece en su vigor, con exclusión de la misión marítima que el anterior artículo prevenía.

ART. 5. Juntamente con la Exposición definida en el tercer artículo de este decreto, se celebrará otra, en Madrid también, la cual ha de comprender las manifestaciones todas del trabajo y la cultura peninsular, desde principios de la restauración visigoda hasta la segunda mitad del siglo XVI.

ART. 6. El Gobierno adoptará por sí, y desde luego, cuantas disposiciones sean necesarias para que una y otra Exposición cuenten con edificios públicos capaces y bajo todos conceptos apropiados al caso.

ART. 7. Habiéndose asimismo de celebrar el próximo Congreso de Americanistas en España, el Gobierno de S. M., á quien ha quedado confiada la designación de ciudad y de edificio, acuerda que tenga aquél lugar en la provincia de Huelva y su monasterio de Santa Maria de la Rábida, inmediato á Palos de Moguer.

ART. 8. De conformidad con la precedente resolución, el Gobierno tomará sin demora también las medidas indispensables para la consolidación, restauración, apropiación y embellecimiento posible del autecitado monasterio y sus alrededores, baciendo por igual manera más accesible el embarcadero de Palos, á fin de facilitar las visitas que ha de atraer la conmemoración del grande acontecimiento en aquellos sitios comenzado.

ART. 9. La Junta directiva, como la Comisión establecida tiempo hace, tendrá por Presidente al del Consejo de Ministros, y su Vicepresidente será asimismo miembro de la última.

ART. 10. Formarán parte de esta Junta los Ministros de Estado, Fomento y Ultramar, directamente obligados á ejecutar sus acuerdos, el Alcalde de Madrid y los dos Secretarios de la Comisión varias veces citada, sin contar otros miembros de ella que por distintos conceptos sean llamados. Serán particularmente invitados á compartir los trabajos de la Junta el Ministro Plenipotenciario de Portugal y una de las Repúblicas hispano-americanas. De igual modo se invitará á los Presidentes de la Unión Ibero-americana, desde su fundación, á los que actualmente lo sean del Ateneo Científico, Literario y Artístico de Madrid, del Fomento de las Artes, de la Cámara de Comercio, del Círculo de la Unión Mercantil y el de la Sociedad de Escritores y Artistas. Con idéntico derecho que los demás tomarán asimismo parte en las deliberaciones de dicha Junta, cuando lo solierten, los Alcaldes de Granada, Valladolid, Barcelona y Huelva, y el Presidente de la Sociedad Colombina Onubense. Cuando no asuma su representación correspondiente cualquiera de las personas antecitadas, podrá hacer sus veces la que legítimamente le sustituya en sus funciones.

ART. 11. El Gobierno agregará á esta Junta en lo sucesivo á los representantes autorizados de cualesquiera otras corporaciones que contribuyan á las fiestas del Centenario.

ART. 12. Tendrá la Junta dos Secretarios y dos Vicesecretarios, escogidos fuera de las mencionadas categorías, pero con voz y voto como los demás.

ART. 13. La Junta directiva se dividirá en cuatro Secciones: una que el Ministro de Estado presidirá, y ha de tener á su cargo las necesarias gestiones para que de América y Europa se remita á Madrid el mayor número posible de los objetos que requiere la Exposición de Arqueología y de Historia americana, así como todo lo concerniente á su organización; otra, de que será Presidente el Ministro de Fomento, que á la preparación de los lugares y edificios públicos consagrados á Exposiciones y festejos, reunirá el especial encargo de estimular y disponer la Exposición del trabajo peninsular, durante las épocas ya determinadas; otra que, bajo la presidencia del Ministro de Ultramar, entenderá en todo lo referente al Congreso de Americanistas en Huelva y á los festejos oficiales que en aquella provincia se celebren, preparando y ordenando además el transporte á la Península de los objetos que de América se destinan á las Exposiciones; otra, por último, cuya presidencia desempeñará el Vicepresidente de la Junta directiva, y que ha de tomar á su cargo enanto tenga relación con las Corporaciones no oficiales que bajo cualquier forma tomen voluntaria parte en la conmemoración del Centenario.

ART. 14. Los dos Secretarios y los dos Vicesecretarios se repartirán entre estas cuatro Secciones. Se distribuirán asimismo los Vocales de la Junta directiva con la proporción posible entre las dichas Secciones, procurando que á cada cual pertenezcan los que representan elementos más congruentes á su especial encargo.

ART. 15. A cada Sección corresponde el nombramiento de Delegado general y Delegados especiales que hayan de estar al frente de las Exposiciones acordadas y de los demás actos y festejos que para la conmemoración del Centenario dispongan.

ART. 16. Las reuniones de la Junta directiva como la de la Comisión existente, se convocarán por su presidencia común, la cual deberá acordarlas siempre que los Presidentes de Secciones lo demanden.

ART. 17. Las fiestas de Huelva podrán dar principio el 3 de Agosto de 1892, al amanecer, y dilatarse hasta el 3 de Noviembre del mismo año. Las Exposiciones y festejos de Madrid empezarán con iluminación de los edificios públicos y de los particulares que lo tengan á bien en la noche del 11 al 12 de Setiembre del año citado.

ART. 18. La nueva Junta directiva, así como sus Secciones, disfrutarán en sus comunicaciones oficiales la franquicia postal y telegráfica que, tratándose de un servicio público, corresponde.

ART. 19. A la propia Junta queda especialmente sometida la reglamentación general de las Exposiciones y de los festejos combinados, y desde luego irá preparándola para su oportuna publicación.

ART. 20. Queda derogado el primero de los decretos de 28 de Febrero de 1888, en cuanto se oponga á las presentes disposiciones. También se entenderá modificado el segundo, si en algo se opone á ellas.

Dado en Palacio á nueve de Enero de mil ochocientos noventa y uno.

MARÍA CRISTINA.

El Presidente del Consejo de Ministros,  
ANTONIO CÁNOVAS DEL CASTILLO.

No. 3.

REPORT OF THE MINISTRY OF SPAIN TO THE QUEEN REGENT, CONCERNING THE COMMEMORATION OF THE FOURTH CENTURY OF THE DISCOVERY OF AMERICA.

[Translation.]

SEÑORA: In deference to the glorious past of the country, your majesty's previous ministry submitted for royal approval the two decrees of February 28, 1888, for an exposition to commemorate, in a worthy manner, the fourth centenary of the discovery of America. In order to carry out these plans, inspired by sincere sentiments, with the efficacy and rapidity which such enterprises demand, we have clearly traced, and indeed gone over, in great part, the road by which the desired end will be reached. But in spite of the good will of all, and for reasons which it would be idle to investigate at the present time, almost three years have gone by without anything having been prepared or even considered.

Some very important rules have been adopted, notwithstanding, and are about to be put into execution by the zealous commission appointed under the second of the aforementioned royal decrees. It will publish, without delay, scholarly volumes intended to illustrate minutely the history of the discovery and, in greater or lesser degree, cause the creation of works of art to contribute to the commemoration of that unparalleled exploit. But even though counting upon such efforts, and upon the special poetic award recently offered by the Royal Spanish Academy, and upon other interesting projects of private associations, there is still much to be done and the time is very short. In order to facilitate the carrying out of the work, the present decree is offered which, upon some points, alters the former provisions, but retains the essential bases and elaborates them.

It is well known that though Columbus tore away the veil which hid the New from the Old World, to our country belongs the honor. If the holy Christian religion illumines to-day the consciences of the human race from Cape Horn to the heart of Mexico it is due to the Spaniards. If Europeans enjoy the wealth of the rich American soil, they owe a debt of gratitude to the untiring labor and to the unyielding valor of our forefathers. For these reasons, though the event may be of international and cosmopolitan interest, it concerns above all the Spanish people on both hemispheres. So certain is this that foreign potentates repress the murmurings of their *amour propre*, and tacitly or expressedly accord to Spain the right to take the initiative in the commemoration of the event. And the peoples of the New World will admit, with greater reason even, that Spanish soil is like the fatherland of the Europeans in America, although they are not all descended from us, nor even speak our native tongue. But whilst we cannot refuse, without dishonor, to undertake the flattering task assigned us, it would, on the other hand, be presumptuous to try to compete with the gigantic national demonstration of pride and enthusiasm which have been displayed in other places than Spain. For many well known reasons we are unable, for the present, to enter into such costly rivalries.

The modesty of the people who have lost what once they held within their grasp, the destinies of the world, is suited to their dignity which might be compromised by vain ostentation,

This must have been the conviction of your majesty's former ministry when it did not think, as others did, that the fourth centenary of the discovery of America should be celebrated in Madrid by an international exposition. But what is now proposed goes still farther, and does not limit the exposition simply to an industrial exhibit by the Hispano-Americans, who recently proved, in their sumptuous structures at the Paris exhibition, their common and increasing prosperity. It is not obligatory, for this reason, that such a display should be made at the approaching centenary. Fortunately, we of the Peninsula and of America possess other elements which, together with those we may be able to borrow, for the purpose from foreigners, would be sufficient to form a basis for a demonstration appropriate to the occasion. No Hispano-American country can fail to possess, as does the mother country, in museums, and in the hands of private individuals, pre-Columbian relics and those contemporaneous with the discovery which, brought together, would excite their common remembrances with no slight benefit both as to science and art. Hence the Government of your majesty proposes to organize a simple exhibit of such articles, renouncing, for lack of sufficient means and time, any more arduous enterprise. From such an exposition might be gathered abundant fruits for the study of archaeology, anthropology, and above all of history, if, in view of the wishes of Spain and still more of the occasion which inspires them, other nations should concur, as there are many such possessing full collections of the desired objects.

The commission constituted in February, 1888, had begun to discuss another sort of exposition, and the present ministry has hastened to put it into execution. The plan is to collect the greatest number possible of the specimens of Iberian productions anterior to the discovery of America, from the time when the new nations of the Peninsula were being formed until, when triumphant within themselves, they sought and found vast territories beyond the seas in which to extend their power. By this means it will not only be possible but easy to compare the respective conditions of culture of conquered and conquerors at the time when they came together, without discriminating among the latter, between Spaniards and Portuguese, although at present they belong to separate and independent states. The fame of incomparable discoveries belongs to us in common, and Spain has always included Portugal in its present plans. No one is ignorant that the cathedrals, churches, museums and private galleries of the nobility of the Peninsula contain precious works of Iberian art collected during the long period referred to, and, perhaps, for the greater part unknown. It may be hoped, therefore, that this second exposition, combined with the first, will redound to the credit of both.

Meanwhile, it is an important fact that the present ministry does not forget that these two enterprises are not restricted by their official character, but will rather stimulate the zeal of private individuals, in general, and that of their several and independent centers of action. Anyone who wishes to do so may bring to the common treasury his intelligence and abilities with all the enthusiasm and freedom he possesses. But it cannot be denied that it is necessary that between the private individuals and the officials there should be established sufficient union as to render each other effectual assistance, and avoid, at least, disturbing each other in their respective efforts, so that the free actions of each may not degenerate into anarchy. And in fact it must be stated that this is not the least of the means, in virtue of which, the ministry now proposes to your majesty to appoint a committee of direction which shall concentrate, assist, and lend organic force to all the elements offered to the enterprise.

As a matter of course your majesty's ministry will still have the supreme control, because of its greater powers and its national character; but this will not interfere with any private efforts which coincide with the endeavors to obtain a good result.

The expositions alluded to and many of the larger entertainments will, of course, take place in Madrid; but the ministry also desires that the assistance of the committee of direction, as well as that of the existing commission, should be extended

to the provinces and cities desiring it, and above all to such as possess the clearest titles as prominent actors in the centenary celebration. Granada, Santa Fé, Valladolid, Barcelona, Sevilla and certain places in Huelva, all of which are doubtless included in the number, will to the best of their respective abilities join with Madrid in this laudable and patriotic manifestation. But it is impossible not to recognize that Huelva, with its never-to-be-forgotten though modest monastery of Santa Maria de la Rábida, and its neighboring coast, rather than port, of Palos de Moguer, where Columbus found asylum, resources and men to second and accompany him, and from which sailed the ships that first reached the New World, deserves on the part of the Government particular attention. It has been arranged that that place and that arm of the sea will be traversed, during the first days of the centenary celebration, by the members of the congress of Americanists who will celebrate in Huelva their ninth anniversary.

On the other hand, the committee appointed under the second of the decrees of 1888, so frequently cited, had already thought of commencing operations in those famous places on the occasion of the centenary. It is now the part of the Government to see that those intentions are extended and fulfilled. And when all the foregoing shall have been well considered, it will be clearly seen that there remains so much to be done to carry out the intentions of the former and of the present ministry, that assiduous and active work will be needed so as to combine all the elements into a useful and complete entirety. This is the object to be attained by the committee of direction which, in virtue of this decree, is to be appointed. In particular the ministers, who form an important part of the committee, from henceforward have no time to lose, knowing that, of necessity, they will have a most difficult and complicated part to perform. In these special duties the whole ministry will assist, whenever necessary, without extravagant expectations but without discouragement, should your majesty give your approval to the accompanying project of the royal decree.

Madrid, January 9, 1891.

Señora: A. L. R. P. de V. M.,

ANTONIO CÁNOVAS DEL CASTILLO.

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No. 4.

CLASSIFICATION FOR THE HISTORIC AMERICAN EXPOSITION, MADRID,  
1892.

I.—PRE-COLUMBIAN PERIOD.

FIRST GROUP.

*Caverns*.—Models, reproductions, plans, drawings, etc., of ancient American caves which may show indications of having served as habitations of Man.

*Monuments, etc.*—Models, reproductions, plans, drawings, etc., of the prehistoric monuments of America, from the menhir, to the dolmens, tumuli, and other megalithic monuments.

*Lake-dwellers*.—Models, reproductions, etc., of remains of lacustrine dwellings. (The representations of prehistoric monuments should be accompanied by the objects found in or near them or by reproductions.)

*Prehistoric arts, etc.*—*Paleolithic and neolithic periods*.—Arms and instruments of stone; instruments of horn and bone; ceramics; adornments and utensils of bone, ivory, marble, wood, stone, or any other substance; objects carved or engraved with stone instruments; stone hammers and mortars; fossils or bones of animals which serve to verify archaeological discoveries; copper and bronze objects; objects belonging to other sciences, such as geology and paleontology, which may serve to throw light upon the so-called prehistoric age of America.

## SECOND GROUP.

*Historic times.*

*Monuments of architecture.*—Models or reproductions of ancient American buildings, military, civic, religious, funereal, etc. Remains of walls, busts, capitals, architraves, friezes, cornices, etc. Polychromatic architecture. Architectonic monuments restored in models or in drawings and plans.

*Monuments of sculpture.*—Statues, pieces or fragments of the same, busts, reliefs, etc., including intaglio work.

*Monuments of painting.*—Paintings of all kinds.

*Monuments of engraving.*—Ineised designs of all kinds.

## THIRD GROUP.

*Industrial and fine arts.*

*Dress.*—Costumes and parts and accessories. Adornments.

*Weapons and arms.*—Offensive and defensive weapons of wood, copper, bronze, and iron.

*Gold and silver work.*—Gold and silver articles, necklaces, earrings, etc.

*Carving.*—Objects of bone, ivory, etc.

*Ceramics.*—Objects of clay of all kinds. Glass.

*Copper and bronze work.*—Copper and bronze objects of all kinds.

*Ironwork.*—Ironwork of all kinds.

*Woven goods.*—Woven tissues and the textile products used in their manufacture.

*Stone and marble work.*—All kinds of objects made of stone.

*Industrial and artistic materials.*—Instruments, machinery, manufactures, and everything relating to the production of industrial or artistic articles. Means of locomotion by land, river, or sea.

## FOURTH GROUP.

*Literary productions.*

*Epigraphy.*—Ancient inscriptions on different materials.

*Paleography.*—Documents, manuscripts, etc.

*Cartography.*—Plans, charts, diagrams, and everything relating thereto.

## FIFTH GROUP.

*Appendix to the first section.*

*Naval architecture, etc.*—Remains or models of vessels, objects, utensils, etc., used in voyages toward America previous to the Columbian period, classified according to antiquity.

## II.—COLUMBIAN AND POST-COLUMBIAN PERIOD.

## SIXTH GROUP.

*Nautical adjuncts to the Discovery of Columbus.*—Caravels, models, and reproductions or drawings of the same, parts, rigging, etc. Astrolabes and mathematical and nautical instruments which may have been used in the vessels of discovery. Sailing charts and maps.

## SEVENTH GROUP.

*Columbus relics.*—Objects which might have belonged to Columbus.

## EIGHTH GROUP.

*Fine arts.*

*Monuments of architecture* in post-Columbian architecture, the product of American art as well as that of the Spanish or other European nations.



*Monuments of sculpture* in America, of the post-Columbian period, the product of American, Spanish, or European art.

*Monuments of painting* of all kinds, American or European.

*Monuments of engraving* of all kinds, American or European.

#### NINTH GROUP.

*Industrial and artistic productions* of this historic period either of purely American art or of Spanish and European art, if the fruits thereof were realized in America, dividing this group into dress, armor, etc.

#### TENTH GROUP.

*American numismatics*.—Coins, paper money, and postage stamps, from earliest times down to 1892.

#### ELEVENTH GROUP.

*Scientific and literary productions*.—Charts, plans, and works of all kinds, in manuscript as well as printed, prepared since the discovery to the middle of the seventeenth century, or relating to the period of discovery, exploration, conquest, and colonization, American, Spanish, or belonging to other European nations.

### III.—APPENDIX.

#### TWELFTH GROUP.

*American ethnography*.—Portraits, photographs, models, dress, etc., belonging to the ancient American races still in existence; manikins, with the dress, arms, etc.; models of habitations, etc. In this group American craniography will form a special division.

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#### No. 5.

### CLASSIFICATION FOR THE HISTORIC EUROPEAN EXPOSITION, MADRID, 1891.

#### I.—FINE ARTS.

##### FIRST GROUP.

*Sculpture*.—Statues, figures and reliefs in metal, stone, wood, or marble. Medals, medallions, and seals. Cameos and glyphs.

*Painting*.—Diptyches, triptyches, and other paintings upon wood, canvas, parchment, or copper. Miniatures, codexes, and parchments. Drawings with pencil or pen. Mosaics, inlaid, or incrustated work.

*Engraving*.—Engravings and etchings.

#### I.—INDUSTRIAL ARTS.

##### SECOND GROUP.

*Fine metal work and jewelry*.—Reliquaries, chalices, tablets, paxes, shrines, etc. Crosses. Halos and coronas. Censers, candelabras, candlesticks, and lamps. Crosiers, clasps, amulets, and crosses for the neck. Fine metal work, repoussé, filigree, niellos, and enamels. Jewels and jewelry. Enamels. Objects of rock-crystal, and precious stone. Hilts of batons, swords, and poniards. Tobacco boxes, etc. Rings, brooches, etc.

## THIRD GROUP.

*Metal work.*—Figures, ornaments, etc., of iron work. Figures, ornaments, etc., of bronze, copper, or other metals, chiseled, repoussé, or molded.

## FOURTH GROUP.

*Panoply.*—Defensive arms, armor, cuirasses, helmets, and pieces of armor, shields, targets, bucklers, etc. Offensive arms, as swords, daggers, poniards, knives, maces, lances, halberds, partizans, pikes, javelins, arrows, crossbows, arquebuses, muskets, firelocks, pistols, pistolets, culverins, etc. Banners, flags, and other insignia.

## FIFTH GROUP.

*Apparel.*—Mitsers and sacerdotal vestments. Masks and jewels, male and female gala dresses. Badges and stars. Watches, fans, and lace. Toilet utensils and needlework.

## SIXTH GROUP.

*Tapestry.*—Altar ornaments, banners, and traveling cloaks. Woven cloths embroidered or painted.

## SEVENTH GROUP.

*Furniture.*—Chests of metal, marble, and wood. Boxes, buffets, chests, secretaries, etc.

## EIGHTH GROUP.

*Ceramics and Glassware.*—Earthenware, porcelain, terra cotta, glass, etc.

## NINTH GROUP.

*Artistic and Industrial Implements.*—Musical instruments. Instruments belonging to the arts and sciences. Bookbindings. Coaches, litters, sledges, and other vehicles.

## LIST OF MEDALS (DIPLOMAS) AWARDED TO THE UNITED STATES EXHIBITORS.

## GRAND DIPLOMA OF HONOR.

To the Government of the United States.

## GOLD MEDAL WITH DIPLOMA.

U. S. National Museum.  
Smithsonian Institution.  
Bureau of Ethnology of the United States, Washington, D. C.  
Mrs. Mary Hemenway, of Boston, Mass.  
Department of Archaeology and Paleontology of the University of Pennsylvania.  
Dr. George Brown Goode.  
Mr. William E. Curtis.  
Dr. J. Walter Fewkes.  
Geological Survey of the United States.  
U. S. Mint.  
Industrial School for adult Indians, Carlisle, Pa.  
Rear Admiral S. B. Luce.

## SILVER MEDAL WITH DIPLOMA.

U. S. Navy Department.  
Military Medical Museum.  
Prof. Thomas Wilson.  
Numismatic and Antiquarian Society, Philadelphia, Pa.  
Department of Public Instruction of the United States.  
Academy of Natural Sciences, Philadelphia, Pa.  
Peabody Museum of Archaeology.  
Mrs. Zelia Nuttall.  
Mr. Stewart Culin.  
Prof. Otis T. Mason.  
Mr. Walter Hough.  
Mr. W. H. Holmes.  
Mr. H. C. Mercer.  
Mr. James W. Ellsworth.  
U. S. Fish Commission.  
U. S. Census Office.  
Mrs. M. E. Stevenson.  
Mrs. M. M. Hazen.

## BRONZE MEDAL WITH DIPLOMA.

Society of the Sons of the American Revolution.  
Postal Department of the United States.  
Meteorological Survey of the United States.

## BRONZE MEDAL WITH DIPLOMA—cont'd.

Coast and Geodetic Survey of the United States.  
Warren K. Moorehead.  
Dr. James C. Welling.  
Dr. Cyrus Adler.  
Department of Agriculture.  
Forestry Division of the United States.  
Dr. John E. Younglove.  
Dr. W. J. Hoffman.  
H. H. Bancroft.  
Edwin E. Howell.

## HONORABLE MENTION.

S. Brownlow Gray.  
Pilgrims' Society (Plymouth).  
F. S. Perkins.  
Byron S. Dodge.  
C. N. Crounse.  
Dr. Hilborn T. Cresson.  
Dr. T. H. Bean.  
Walter C. Clephale.  
Col. Gates F. Thurston.  
Rev. Stephen G. Peet.  
Capt. John G. Bourke.  
Dr. Henry Carrington Bolton.  
J. C. Pilling.  
James Terry.  
Dr. Joseph Jones.  
Rev. J. Owen Dorsey.  
Dr. Cyrus Thomas.  
Prof. Edward S. Morse.  
James Mooney.  
H. W. Henshaw.  
Col. F. A. Seely.  
James Stevenson.  
Dr. C. Hart Merriam.  
Lieut. A. P. Niblack, U. S. Navy.  
Joseph Sabin.  
Houghton, Mifflin & Co.  
Charles Scribner's Sons.  
Charles S. Reynolds.  
Col. H. M. Flagler, U. S. Army.  
Alexander Brown.  
Dr. Franz Boas.  
Eben Norton Horsford.  
Dr. Frederiek Starr.  
Ellen Russell Emerson.  
Dr. R. H. Lamborn.  
Harper Brothers.  
Total, 80.

## LIST OF EXHIBITORS OF THE UNITED STATES OF AMERICA.

- U. S. National Museum, Washington,  
D. C.  
Smithsonian Institution, Washington,  
D. C.  
U. S. Mint.  
Society of the Sons of the American Rev-  
olution.  
Plymouth Pilgrim's Society, Massachu-  
setts.  
U. S. Navy Department.  
Bureau of Ethnology of the United  
States.  
Department of Public Instruction of  
the United States.  
Census Office of the United States.  
U. S. Coast and Geodetic Survey.  
Military Medical Museum, Washington,  
D. C.  
U. S. Fish Commission.  
U. S. Geological Survey.  
U. S. Meteorological Survey.  
U. S. Post-Office Department.  
Department of Agriculture.  
Forestry Division.  
Mrs. Hazen, widow of Gen. Hazen.  
Dr. G. Brown Goode.  
S. Brownlow Gray, Bermuda.  
School for Indian adults (industrial),  
Carlisle, Pa.  
F. S. Perkins.  
Byron E. Dodge, Michigan.  
C. M. Crouse, New York.  
Dr. Hilborn T. Cresson.  
Dr. John E. Younglove.  
Prof. Thomas Wilson.  
Mrs. Mary Hemenway, Boston, Mass.  
Historical-American Association, Wash-  
ington.  
American Folk-lore Society.  
Anthropological Society, Washington.  
Virginia Historic Society, Richmond.  
Department of Archaeology and Paleon-  
tology of the University of Pennsyl-  
vania.  
Numismatic and Antiquarian Society of  
Philadelphia.  
Academy of Natural Sciences, Philadel-  
phia.  
Museum of Comparative Zoology, Cam-  
bridge.  
Peabody Museum of Archaeology and  
Ethnology, Cambridge, Mass.  
Mrs. Zelia Nuttall.  
Dr. T. H. Bean, Washington.  
Walter C. Clephane, Washington, D. C.  
Col. Gates J. Thruston, Nashville, Tenn.  
Stewart Culin, Philadelphia.  
Rev. Stephen G. Peet, Avon, Ill.  
Dr. James C. Welling, Washington, D. C.  
John G. Bourke, captain Seventh Regi-  
ment, U. S. Army.  
Dr. Henry Carrington Boiton, New York.  
Dr. C. Hart Merriam, Washington, D. C.  
J. C. Pilling, Geological Survey.  
Prof. Otis T. Mason, U. S. National  
Museum.  
Walter Hough, U. S. National Museum.  
W. H. Holmes, Bureau of Ethnology.  
James Terry, New York.  
Dr. Joseph Jones, New Orleans, La.  
Rev. J. Owen Dorsey, Bureau of Eth-  
nology.  
Dr. Cyrus Thomas, Bureau of Eth-  
nology.  
Prof. Edward S. Morse, Salem, Mass.  
James Mooney, Bureau of Ethnology.  
H. W. Henshaw, Bureau of Ethnology.  
Col. F. A. Seely, Patent Office of the  
United States.  
Mrs. M. E. Stevenson, Bureau of Eth-  
nology.  
James Stevenson.  
Lient. A. P. Niblack, U. S. Army.  
Warren K. Moorehead, Xenia, Ohio.  
Joseph Sabin, New York.  
Houghton, Mifflin & Co., New York.  
Harper Brothers, New York  
Charles B. Reynolds, New York.  
Col. H. M. Flagler, U. S. Army.  
Alexander Brown, Norwood, Va.  
William E. Curtis, Chief of Latin-Ameri-  
can Department, World's Columbian  
Exposition, Chicago, Ill.  
Dr. Franz Boas, Worcester, Mass.  
Eben Norton Horsford.  
Frederick Starr.  
Ellen Russell Emerson.  
H. C. Mercer.  
Dr. R. H. Lamborn.  
Dr. Cyrus Adler.  
Dr. W. J. Hoffman.  
H. H. Baneroff.  
Edwin E. Howell.  
Charles Scribner's Sons, publishers, New  
York.