
SECTION I.

REPORT UPON THE CONDITION AND PROGRESS OF THE U. S.
NATIONAL MUSEUM DURING THE YEAR
ENDING JUNE 30, 1887,

BY

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FIFTIETH CONGRESS, FIRST SESSION.

Concurrent resolution adopted by the House of Representatives July 23, 1888, and by the Senate October 1, 1888.

Resolved by the House of Representatives (the Senate concurring), That there be printed of the Report of the Smithsonian Institution and of the National Museum for the years ending June 30, 1886 and 1887, in two octavo volumes for each year, 16,000 extra copies of each, of which 3,000 copies shall be for the use of the Senate, 6,000 copies for the use of the House of Representatives, and 7,000 copies for the use of the Smithsonian Institution.

REPORT UPON THE CONDITION AND PROGRESS OF THE U. S. NATIONAL MUSEUM DURING THE YEAR ENDING JUNE 30, 1887.

A.—GENERAL CONSIDERATIONS.

The report now presented relates to the period between June 30, 1886, and July 1, 1887. Before the completion of the report the Museum had suffered the loss of him who had been for ten years its official head, and who, from the very beginning of the Museum work of the Smithsonian Institution, had been its chief administrator and promoter. Although it is proper that any extended statement concerning Professor Baird and his relation to the Museum should be reserved for the report for the year in which his death occurred, it seems to be proper to refer in this place to the beginning of his protracted illness, in the fall of 1886, and to the year of sadness which followed, in which none of his assistants and associates could possibly feel the usual enthusiasm or interest in the work in which he had always been their leader as well as their director and counselor.

The work of the Museum was carried forward during the year in the customary way, and the amount of actual routine work accomplished has perhaps not been less than in previous years. There is, however, less of interest to chronicle in the way of new enterprises, and scarcely more will be attempted at this time than the customary statement of the progress of administrative routine.

One of the last official acts of the late Secretary was to request the Board of Regents, at its meeting on the 12th of January, 1887, to appoint two Assistant Secretaries of the Smithsonian Institution, who should relieve the Secretary of a portion of his official duties. By the appointment of Professor Langley to the position of Assistant Secretary in charge of Exchanges, Publications, and Library, and of myself as Assistant Secretary in charge of the National Museum, it was the definite purpose of the late Secretary to effect a return to the system of organization which existed at the time of his first connection with the Smithsonian Institution in 1870, when the senior Assistant Secretary was officially in charge of the Library, and the junior Assistant Secretary—himself—in charge of the Museum collections. It was Professor Baird's earnest desire that, so far as the Museum was concerned, the appointment of its executive officer to an assistant secretaryship

should lead to the strengthening of the bond of union between the Institution and the National Museum, a bond which, although nominally the same as it was twenty-eight years ago, had, as a matter of fact, become somewhat less definite and intimate.

The relations of the Museum to the Interior Department, as they now exist, are undefined and complicated, and it is important that early steps should be taken to secure that definite control over the Museum, on the part of the Regents of the Smithsonian Institution, which in later years it became more and more evident that it was the desire of Professor Baird to emphasize.

On the 10th of February, 1887, Professor Baird relinquished his active administrative control of the Institution and the Museum into the hands of the senior Assistant Secretary, who was at that time designated Acting Secretary; and from that time forward his failing strength prevented him from further efforts in its behalf. In the midst of his illness, however, he found time in July to arrange for a collecting expedition from Wood's Holl to Nantucket, for the purpose of obtaining a collection of sharks, and the letter which he wrote at that time shows that the Museum was in his mind to the last.

During the same summer he took advantage of a long-cherished plan for sending a Museum expedition to the islands in the Gulf of St. Lawrence to search for the remains of the long extinct Great Auk, by sending two collectors upon the Fish Commission schooner *Grampus*, which went to that region for the purpose of investigating the fisheries.*

B.—THE MUSEUM STAFF.

Few changes have been made during the year in the arrangement of the Museum staff. Prof. O. C. Marsh, of Yale College, whose high reputation as a paleontologist is familiar to all, and who has for many years been in charge of the vertebrate paleontological work of the U. S. Geological Survey, was early in the year appointed curator of the department of Vertebrate Fossils. Mr. S. R. Koehler, of Roxbury, a well-known authority upon the art of engraving, and custodian of the Gray Collection in the Boston Museum of Fine Arts, has undertaken to give a portion of his time to the arrangement of the collections of engravings, and has been appointed acting curator of the section of Graphic Arts.

Mr. A. Howard Clark has been requested to undertake the editorial work in connection with the Proceedings and Bulletin of the Museum, by this arrangement relieving Dr. Bean, who, since 1875, has performed this duty in addition to that of curator of Fishes.

The thirty-one departments and sections now recognized in the Museum are administrated by twenty-six curators and acting curators, of whom nine receive salaries from the Museum appropriation, while

* A report upon the results of this expedition will be published in the report for 1888.

four are "honorary" or unpaid officers, detailed from the U. S. Fish Commission, one from the U. S. Navy, five from the U. S. Geological Survey, one from the Bureau of Ethnology, and two are volunteers.

THE SCIENTIFIC STAFF.

The scientific departments are now arranged as follows:

DIVISION OF ANTHROPOLOGY.

- I. Department of Arts and Industries, the Assistant Secretary acting as curator, with adjunct curatorships as follows:
 - Animal Products, R. Edward Earll, U. S. Fish Commission, acting curator.
 - Foods, Romyn Hitchcock, acting curator.
 - Fisheries, R. Edward Earll, acting curator.
 - Materia Medica, H. G. Beyer, M. D., U. S. Navy, honorary curator.
 - Textile Industries, Romyn Hitchcock, acting curator.
 - Historical Relics, A. Howard Clark, assistant curator.
 - Transportation, J. E. Watkins, honorary curator.
 - Graphic Arts, S. R. Koehler, acting curator.
 - Naval Architecture, J. W. Collins, U. S. Fish Commission, honorary curator.
- II. Department of Ethnology, Otis T. Mason, curator.
 - Department of American Aboriginal Pottery, W. H. Holmes, Bureau of Ethnology, honorary curator.
- III. Department of Archæology, Charles Rau, curator.

DIVISION OF ZOOLOGY.

- IV. Department of Mammals, F. W. True, curator.
- V. Department of Birds, Robert Ridgway, curator; Leonhard Stejneger, assistant curator.
 - Department of Birds Eggs, Charles E. Bendire, U. S. A., honorary curator.
- VI. Department of Reptiles and Batrachians, H. C. Yarrow, M. D., U. S. A., honorary curator.
- VII. Department of Fishes, Tarleton H. Bean, curator.
- VIII. Department of Vertebrate Fossils, O. C. Marsh, honorary curator.
- IX. Department of Mollusks, W. H. Dall, U. S. Geological Survey, honorary curator; R. E. C. Stearns, adjunct curator.
- X. Department of Insects, C. V. Riley, entomologist of the Department of Agriculture, honorary curator; J. B. Smith, assistant curator.
- XI. Department of Marine Invertebrates, Richard Rathbun, U. S. Fish Commission, honorary curator.
- XII. Department of Comparative Anatomy, F. W. True, curator; F. A. Lucas, assistant curator.
- XIII. Department of Invertebrate Fossils:
 - Paleozoic section, C. D. Walcott, U. S. Geological Survey, honorary curator.
 - Mesozoic section, C. A. White, U. S. Geological Survey, honorary curator.
 - Cenozoic section, W. H. Dall, U. S. Geological Survey, honorary curator.

DIVISION OF BOTANY.

- XVI. Department of Fossil Plants, Lester F. Ward, U. S. Geological Survey, honorary curator; F. H. Knowlton, assistant curator.
- XV. Department of Recent Plants, Lester F. Ward, U. S. Geological Survey, honorary curator; F. H. Knowlton, assistant curator.

DIVISION OF GEOLOGY.

- XVI. Department of Mineralogy, F. W. Clarke, chief chemist U. S. Geological Survey, honorary curator; William S. Yeates, assistant curator.
- XVII. Department of Lithology and Physical Geology, George P. Merrill, curator.
- XVIII. Department of Metallurgy and Economic Geology, Fred. P. Dewey, curator.

C.—THE CONDITION OF THE COLLECTIONS.

The general condition of the collections is fairly satisfactory; for, although greatly hampered by lack of room, and impeded by the increasing amount of unproductive routine, such as the examination of material for correspondents and the preparations for participation in exhibitions in other cities, the curators have succeeded in bringing the material under their charge more fully under control than it had hitherto been and in preventing any deterioration in its condition.

CENSUS OF THE COLLECTIONS.

The recent extensions of the collections are indicated by the accompanying table. No enumeration was made in 1885, and the variation between the tables for 1884 and 1886 exhibits the increase during eighteen months, from December, 1884, to June, 1886.

Table showing yearly increase in the collections in the National Museum, 1882-1887.

Name of department.	1882.	1883.	1884.	1885.	1885-'86.	1886-'87.
Arts and industries:						
Materia medica.....		4,000	4,442		4,850	5,516
Foods.....		21,244	1,580		3,822	4,877
Textiles.....			2,000		3,064	3,144
Fisheries.....			5,000		3,870	10,078
Animal products.....			1,000		2,792	2,822
Naval architecture.....			600			
Historical relics.....					1,002	
Coins, medals, paper money, etc.....					1,055	13,634
Musical instruments.....					400	417
Modern pottery, porcelain, and bronzes.....					2,278	2,238
Paints and dyes.....					377	100
"The Catlin Gallery".....					500	500
Physical apparatus.....					250	251
Oils and gums.....					3197	198
Chemical products.....					3659	661
Ethnology.....			200,000		500,000	503,764
American aboriginal pottery.....			12,000		25,000	526,022
Prehistoric anthropology.....	35,512	40,491	45,252		65,314	101,659
Mammals (skins and alcoholics).....	4,660	4,920	5,694		7,451	7,811
Birds.....	44,354	47,246	50,350		55,945	54,987
Birds' eggs.....			40,072		44,168	648,173
Reptiles and batrachians.....			23,495		25,344	27,542
Fishes.....	50,000	65,000	68,000		75,000	100,000
Mollusks.....	733,375		400,000		8460,000	425,000
Insects.....	1,000		151,000		500,000	555,000
Marine invertebrates.....	11,781	14,825	200,000		350,000	450,000
Comparative anatomy:						
Osteology.....	3,535	3,640	4,214			
Anatomy.....	70	103	3,000		10,210	511,022
Palæozoic fossils.....		20,000	73,000		80,482	84,491
Mesozoic fossils.....			100,000		69,742	70,775
Cenozoic fossils.....			(Included with mollusks.)			

¹ No census of collection taken.

² Including paints, pigments, and oils. . . ⁷ Catalogue entries.

³ Duplicates not included.

⁴ Foods only.

⁵ Estimated.

⁶ 2,235 are nests.

⁷ Catalogue entries.

⁸ Including Cenozoic fossils.

⁹ Professor Riley's collection numbers 150,000 specimens.

Table showing yearly increase in the collections in the National Museum, etc.—Continued.

Name of department.	1882.	1883.	1884.	1885.	1885-'86.	1886-'87.
Fossil plants		4,624	17,291	.....	27,429	8,462
Recent plants					30,000	332,000
Minerals		14,550	16,610	.....	18,401	18,601
Lithology and physical geology	49,075	12,500	18,000	.....	20,647	21,500
Metallurgy and economic geology		30,000	40,000	.....	48,000	349,000
Living animals						
Total	193,362	263,143	1,472,600	.....	2,420,944	2,666,335

¹ Fossil and recent.² Exclusive of Professor Ward's collection.³ Estimated.⁴ In reserve series.

CATALOGUE ENTRIES.

The words "accession," "specimen," and "catalogue entry" are by no means synonymous. An *accession* may consist of several *classes* of objects, or may be a *single* specimen, or may include *several specimens of only one class*. A *specimen* is a single object. A *catalogue entry* represents one or more specimens of a class, and may include hundreds of individual objects. The number of catalogue entries during the year, as shown in the following table, is perhaps the best criterion of the importance of the accessions to the collections, since they represent the number of separate "lots" not only received but of sufficient value to be added to the collections. It frequently happens that material is received which is of no value and is therefore not entered on the catalogue.

Number and name of department.	Total number of entries.	Number and name of department.	Total number of entries.
I. Arts and industries:		IX. Mollusks	10,530
Materia medica	73	I. Insects	101
Textile industries	59	XI. Marine invertebrates ..	5,252
Foods	55	XII. Comparative anatomy:	
Animal products	425	Mammals	} 812
Philosophical instruments	1	Birds	
Fisheries	324	Reptiles and batrachians	
Chemical products	2	Fishes	
Musical instruments	17	XIII. Invertebrate fossils:	
Historical relics, coins, badges, etc	3,122	a. Paleozoic	1,036
II. Ethnology	2,308	b. Mesozoic	1,033
American aboriginal pottery	1,022	c. Cenozoic.*	
III. Archaeology	3,863	XIV. Fossil plants	9
IV. Mammals	417	XV. Recent plants	30
V. a. Birds	2,393	XVI. Minerals	875
b. Birds' eggs	355	XVII. Lithology and physical geology	442
VI. Reptiles and batrachians	130	XVIII. Metallurgy and economic geology	671
VII. Fishes	1,225	Total	36,695
VIII. Vertebrate fossils	13		

* Included under "Mollusks."

PROGRESS IN CLASSIFICATION AND ARRANGEMENT OF THE STUDY SERIES.

The final classification and arrangement of the material is a work of great moment, and the curator who makes progress in this direction is forwarding the legitimate objects of the Museum quite as much as if his whole time had been devoted to the acquirement of new material. Until a collection has been classified and arranged, it is of little or no use to visitors and students. Referring to the zoological collections, Professor Henry wrote in his report for 1856: "However valuable these collections may be in themselves, they are but the rough materials from which science is to be evolved, and so long as the specimens remain undescribed and their places undetermined in the system of organized beings, though they may serve to gratify an unenlightened curiosity, they are of no importance in the display of the laws of life."

The reports of the curators for the year give evidence of a steady forward movement in the work of classification and arrangement.

DEVELOPMENT OF THE EXHIBITION SERIES.

The general appearance of the exhibition halls has been somewhat improved during the year. The Grant relics have been placed in cases and have proved of much interest to the visitors. Considerable material has been gathered for the collection illustrating the graphic arts.

The east and west halls have been made attractive by the installation of the ethnological collection. The arrangement of Eskimo tools and implements is very satisfactory. The archæological collection is still exhibited in the upper floor of the Smithsonian building, and its arrangement is thorough and excellent. New cases have been constructed for the mammal collection, which is now being overhauled with a view to introducing a more satisfactory system of classification. The collection of birds still remains in the Smithsonian building, and although the hall, in which it is now, is entirely unfit for the purpose, no change for the better can be made until an additional building has been provided. There are now 7,000 specimens of birds on exhibition. The reptile collection is still stored away in the laboratory of the department on account of lack of room, a few casts of snakes and turtles, which are exhibited in the Smithsonian building, being the only representatives of this collection. The exhibition series of fishes, now numbering 34,000 specimens, is still unprovided with proper accommodations, and is installed temporarily in the Smithsonian building. The department of Mollusks has filled a few cases in the Smithsonian building with very interesting material, but nothing more can be done at present on account of lack of room. The same may be said in regard to the department of Insects, whose exhibit, when proper space can be provided, will probably become one of the most popular in the Museum. The osteological hall continues to present a very satisfactory appearance, which is enhanced by the effective method of labeling and installation

which has been adopted. The curators of the several divisions of the department of Invertebrate Fossils are still unprovided with exhibition space. An immense quantity of material in each of these sections is ready for exhibition, and a special effort will be made during the autumn to provide in some measure for their exigencies. The collections of fossil and recent plants are provisionally arranged upon the south balcony, where they are at all times accessible to students. The curator of Minerals is giving much attention to building up the collection of meteorites. Several new cases have been constructed for the lithological hall, which will afford some relief to the unavoidably crowded condition of this collection. In this hall is being gathered together a valuable collection of relief maps and models showing the geological features of various parts of the United States.

D.—REVIEW OF THE YEAR'S WORK IN THE SCIENTIFIC DEPARTMENTS.

DIVISION OF ANTHROPOLOGY.

DEPARTMENT OF ARTS AND INDUSTRIES.

It has seemed desirable to continue the existence of the so-called department of Arts and Industries, as a convenient means of grouping together a number of special collections not elsewhere assigned, although the scope of this department is much less extensive than it was before the organization of the department of Ethnology, to which properly belongs a very large proportion of the objects formerly assigned to the department of Arts and Industries.

In this department, under the charge of a number of special curators, are included at present the various technological collections, which are for the most part made up of materials derived from the civilized races of mankind.

In the hall containing the Fisheries collection very little has been done since its formal opening to the public in April, 1884. Its arrangement had at that time been so thoroughly completed that this section was considered to be more nearly in a finished condition than any other in the Museum, and there was little left to be desired in the way of additional material. The collection is still under the charge of Mr. R. Edward Earll, one of the assistants in the Fish Commission, who has been so much occupied by his regular official duties that he has had little time to devote either to this or to the other collection of which he has voluntarily assumed the care, that of the Animal Products, which was thoroughly adjusted after its return from the New Orleans Exposition in the spring of 1885.

The section of Naval Architecture is also under the charge of an honorary curator attached to the Fish Commission, who has been con-

stantly absent from the city, and there is little to report in the way of addition or change.

The section of Transportation, closely related to that of Naval Architecture, is under the charge of Mr. J. E. Watkins, of Philadelphia, who continues to act as honorary curator, and whose plans were described at length in his report presented last year. Owing to lack of space in the exhibition halls, no new steps have been taken in the development of the collection, although there are known to be numerous important objects which can be secured whenever arrangements shall have been made for their reception.

The absence in Japan of Mr. Romyn Hitchcock has necessitated a suspension of operations in the sections of Foods and Textile Industries.

The collections of Musical Instruments and Ceramics have received a number of important additions.

The Materia Medica collection is still under the charge of Dr. H. G. Beyer, U. S. Navy, who has been carrying forward with great industry the general plans adopted at the time of the establishment of this section in 1881, and who reports that up to the present time the arrangement and labeling of 1,970 specimens had been completed. Dr. Beyer has carried on a number of experiments in pharmaco-physiology and has published several papers. This work of investigation has been carried on chiefly at the laboratories of the Naval Museum of Hygiene in Washington, and of Johns Hopkins University. Incidentally Dr. Beyer had devoted a considerable amount of time to devising methods for preservation of the perishable animal and vegetable substances of which the bulk of the Materia Medica collection is composed, and reports that he has found bichloride of mercury to be the most satisfactory germicide. Seventy-three entries have been made in the catalogue during the year. The total number of specimens registered is 5,516, there being 3,488 in the exhibition series and 500 duplicates.

The collection of historical and personal relics, coins, medals, engraved portraits, and similar objects, is gradually increasing, though without direct effort, and Mr. A. Howard Clark, for some time attached to the Museum, has begun the work of cataloguing and arranging them. It would appear that no part of the work is more attractive to the visitor than that in which are displayed the personal relics of Washington, Franklin, Jefferson, and the other statesmen and soldiers identified with the early history of the nation, and its interest has been greatly increased during the year by the addition of the Grant collection of objects, including the swords and military and civil testimonials belonging to General U. S. Grant. These had been purchased by Mr. W. H. Vanderbilt, and by him given to Mrs. Grant in trust to hold during the lifetime of General Grant, and at his death, or sooner, at her option, to become the property of the United States Government. In accordance with Mrs. Grant's request, the transfer of this collection was made by

Mr. Vanderbilt in 1885, and a copy of his letter to the President of the United States transmitting the deed of trust is here given :

640 FIFTH AVENUE, *January 20, 1885.*

DEAR SIR: I purchased the articles of historical interest belonging to General Grant and gave them to Mrs. Grant in trust, to hold during the life-time of the general, and at his death, or sooner, at her option, they to become the property of the Government. They consist of his swords, memorials of his victories, from the United States and cities, and tributes to his fame and achievements from Governments all over the world. In their proper place at Washington they will always be secure, and will afford pleasure and instruction to succeeding generations. This trust has been accepted by Mrs. Grant, and the disposition of the articles is in conformity with the wishes of the general. I transmit to you herewith the deed of trust. Mrs. Grant informs me that she prefers to close the trust at once and send the memorials to Washington. May I ask, therefore, that you will designate some official representing the proper department to receive them, and direct him to notify Mrs. Grant of the arrangements necessary to perfect the transfer and deposit in such of the Government buildings as may be most suitable?

Yours, respectfully,

W. H. VANDERBILT.

His Excellency CHESTER A. ARTHUR,
President of the United States.

The matter was formally brought to the attention of Congress by the President of the United States in a message dated February 3, 1885, a copy of which follows :

To the House of Representatives :

I take especial pleasure in laying before Congress the generous offer made by Mrs. Grant to give to the Government, in perpetual trust, the swords and military and civil testimonials lately belonging to General Grant. A copy of the deed of trust, and of a letter addressed to me by Mr. W. H. Vanderbilt, which I transmit herewith, will explain the nature and motives of this offer.

Appreciation of General Grant's achievements and recognition of his just fame have in part taken the shape of numerous mementoes and gifts which, while dear to him, possess for the nation an exceptional interest. These relics, of great historical value, have passed into the hands of another, whose considerate action has restored the collection to Mrs. Grant as a life trust, on the condition that at the death of General Grant, or sooner, at Mrs. Grant's option, it should become the property of the Government. * * * In the exercise of the option thus given her Mrs. Grant elects that the trust shall forthwith determine, and asks that the Government designate a suitable place of deposit and a responsible custodian for the collection.

The nature of this gift and the value of the relics which the generosity of a private citizen, joined to the high sense of public regard which animates Mrs. Grant, has thus placed at the disposal of the Government, demand full and signal recognition on behalf of the nation at the hands of its representatives. I therefore ask Congress to take suitable action to accept the trust and to provide for its custody, at the same time recording the appreciative gratitude of the people of the United States to the donors. * * *

CHESTER A. ARTHUR.

EXECUTIVE MANSION, *February 3, 1885.*

In the mean time the collection was placed in charge of the War Department until definite action had been taken by Congress, and on August 5, 1886, the following resolution was adopted and became a law :

Whereas Julia Dent Grant and William H. Vanderbilt, by deed of trust executed on the tenth day of January, eighteen hundred and eighty-five, presented to the

United States certain swords, medals, paintings, bronzes, portraits, commissions, and addresses and objects of value and art presented by various Governments in the world to General Ulysses S. Grant as tokens of their high appreciation of his illustrious character as a soldier and a statesman: Therefore,

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That the United States accept, with grateful acknowledgment, the said property and articles more fully described in the schedule attached to said deed of trust, to be held by the United States and preserved and protected in the city of Washington for the use and inspection of the people of the United States.

SEC. 2. That the said property and articles be placed under the custody of the Director of the National Museum, and he is hereby directed to receive the same for safe keeping therein.

Approved August 5, 1886.

The collection was transferred to the National Museum in November, 1886. A complete catalogue of the objects in this collection is given in the list of accessions, under No. 18528.

During the year has been commenced the formation of a collection of moneys of the world, exhibiting the metallic and paper currency in use at the present time, and the moneys of the ancient world. Several thousand specimens have been received by gift and loan, and a considerable number of them have been put on exhibition. In preparing the labels an attempt has been made to show the monetary standard of different nations and give the origin of each denomination.

The principal activity in this department has been in the promotion of the collection of Graphic Arts, for which provision was made in the general plan of classification proposed six years ago, and materials for which have since been accumulating so rapidly that it has become necessary to make some provision for their installation. In December, 1882, Mr. S. R. Koehler, of Boston, was invited to undertake the installation of an exhibition collection, illustrating the method of lithography, which had been presented to the National Museum by Mr. Louis Prang, and the preparation of a manual in connection with the same. At that time Mr. Peter Moran, of Philadelphia, was preparing for the Museum a series of plates illustrating the process of etching, and a set of etcher's tools. This was to form a basis for the etching collection. The Heliotype Company, the Photo-Engraving Company of New York, and several other firms and individuals, had tendered their co-operation. The Director of the United States Mint has offered to illustrate the art of die cutting, and Ringler & Co., of New York, have in hand the illustration of the process of electrotyping.

An excellent nucleus for a collection representing the graphic arts seemed to be available, but active steps towards its installation were materially retarded by the preparation of exhibits for the London Fisheries Exhibition in 1883, and for the New Orleans and other expositions in 1884. Matters did not take any definite shape until December 11, 1886, when Mr. Koehler was appointed acting curator of the section of Graphic Arts.

Offers of several collections additional to those already mentioned have recently been made. Hoen & Co., of Baltimore, are preparing an exhibit of the lithocautic process. Mr. Charles Henry Hart, of Philadelphia, has given a number of specimens of work of the earlier American engravers. Messrs. Thomas Hovenden, Stephen Parrish, Peter Moran, James D. Smillie, Charles H. Miller, Alfred Kappes, Henry Farrer, and F. Juangling, of New York, have promised to contribute etchings and drawings. Mr. W. J. Linton, of New Haven, presents a collection of proofs, including both his own work and that of some English wood engravers. He has also promised a number of fac-similes of old work, collected by himself. The Century Company offers a technical collection—blocks, tools, etc.—drawings showing the various styles employed in designing for engravings, some of the process work done for them, and a series of proofs chronologically arranged. Harper & Brothers promise specimens of their work dating from the organization of their house, if possible. Mr. J. W. Osborne, of Washington, has a large and very interesting collection of early attempts in various processes, many of the specimens being undoubtedly unique, and this he wishes to present to the Museum if assured that it would be properly cared for. The Photogravure Company has offered to make a technical exhibit.

Arrangements have been made with the School of Drawing and Painting at the Museum of Fine Arts at Roxbury, Massachusetts, for a set of students' drawings illustrating various technical methods, and a selection of the best drawings will be made. The Art Students' League, in New York, will probably make a similar contribution. Among the latest accessions to this section is a machine said to have been invented and used by Joseph Saxton for engraving on copper plate.

DEPARTMENT OF ETHNOLOGY.

The additions to the ethnological collections have this year been of extraordinary value, and are described in the appended report of Professor Mason upon the work of his department. Nearly 2,500 entries have been made in the ethnological catalogue, and the work of classifying and arranging the great accumulations of the past has been actively continued. The results of the curator's labors in this direction will be more fully seen, as soon as certain proposed re-arrangements in the exhibition halls have made it possible to assign additional space and to construct more suitable exhibition cases. Special attention has been paid to the entire Eskimo collection, which is an exceedingly rich one, and probably unsurpassed even by the famous one of similar nature in the Ethnographic Museum at Copenhagen. In this work the curator has been assisted by Lieut. T. Dix Bolles, U. S. Navy, who, having been stationed for some years on the northwest coast, was familiar with the customs of the Eskimo race and especially well suited for this work. In this connection Lieutenant Bolles has prepared an

exhaustive catalogue of the Eskimo collection in the National Museum, with indications of the localities in which the specimens were obtained. This geographical list is published in Section III of this report. It will be especially serviceable to collectors in the Arctic regions, who will be able at a glance to determine whether or not certain forms of implements are represented in the national collection.

Mr. L. M. Turner, formerly a Signal Service observer in Alaska and Labrador, has prepared for the use of this department an elaborate manuscript report relating to the Eskimo objects collected by himself and now in the Museum.

Paymaster E. B. Webster, U. S. Navy, also an experienced Alaskan traveler, was for six months detailed by the Navy Department for service in the National Museum, and rendered valuable assistance to the curator of ethnology.

Among the studies in progress in this department two have been brought to completion, and the results have been published in Section III of this report in the form of illustrated papers upon "The Human Beast of Burden" and "Cradles of the American Aborigines."

The methods of classification and arrangement now experimentally employed in the National Museum have given rise to much discussion, as it was but natural that they should, since they are so thoroughly unlike those employed in any of the other museums of the world. The conditions of growth and the character of the collections in the Museum have been from the start peculiar, and the adoption of novel means of administration was found to be necessary. In the first separate report upon Museum work, published in 1881, certain suggestions were made which became the subject of vigorous criticism on the part of some of the scientific journals. Passing reference has been made to this matter in previous reports, and it is probable that a full discussion of the subject may be undertaken hereafter. During the present year a very interesting debate has taken place in the columns of "Science" in regard to the proper method of arrangement of ethnological collections. The discussion was opened by Dr. Franz Boas, a German ethnologist, now a resident of New York, and was participated in by Professor Mason, Major J. W. Powell, and Mr. William H. Dall.

SECTION OF AMERICAN ABORIGINAL POTTERY.

Mr. W. H. Holmes, the curator of this department, has completed his studies of the wonderful pottery collection from Chiriqui, in Nicaragua. He reports that much valuable new material has been acquired, especially noteworthy having been that obtained through the agency of the Bureau of Ethnology, in the collections purchased from Dr. Edward Palmer and Mr. W. E. Curtis.

Col. James Stevenson, of the Geological Survey, has transferred to this department a series of Pueblo pottery, ancient and modern, collected by himself in 1881, and Dr. Cyrus Thomas, of the Bureau of

Ethnology, made some collections of pottery in the Mississippi Valley and the eastern states. A number of interesting pieces of Mexican and Peruvian work has been acquired by exchange.

The catalogue records show that 1,022 entries have been made during the year.

DEPARTMENT OF ARCHÆOLOGY.

The report of the curator, Dr. Charles Rau, consists chiefly of a geographical review of the principal accessions. Among these may be mentioned as especially valuable the collection of Mr. Thomas Wilson, made in Europe, embracing drift and cave relics of the paleolithic age, objects belonging to the neolithic age and the bronze period, and specimens of Etruscan and Roman origin.

The curator is writing a work upon North American antiquities, to be entitled, "The Typical Forms of North American Prehistoric Relics of Stone and Copper in the U. S. National Museum."

There have been 3,863 entries made in the catalogue during the year. The total number of specimens is 101,659, of which a large proportion has been received through Major J. W. Powell, director of the Bureau of Ethnology of the Smithsonian Institution.

The failing health of the curator has made it necessary for him to be absent during a portion of the year, and but little has been accomplished beyond the necessary routine work of the Department.

During the year the Museum was so fortunate as to secure a valuable accession from Easter Island, comprising two of the celebrated stone images, a large number of painted and carved slabs from the rock houses, and a choice collection of objects illustrating the ancient and modern history of the island. The last-named specimens have been lent to the Museum by Paymaster William J. Thomson, U. S. Navy.

Professor Baird made frequent attempts to secure specimens of the archæology of this island, and in 1885 received from Commodore John G. Walker, Chief of the Bureau of Navigation, the gratifying intelligence that the U. S. S. *Mohican* would be sent to Easter Island to relieve some American sailors who had been reported as castaways there. This expedition met with signal success. The *Mohican* anchored in Cook Bay in December, and spent twelve days there. A thorough survey of the island was made, and everything was secured which would enable the explorers to make a thorough report.

The specimens were brought to Panama by the *Mohican*. The Panama Railroad Company kindly forwarded the collections across the Isthmus to Aspinwall, and they were brought to Washington in the U. S. S. *Galena*.

Easter Island is a small volcanic projection, 12 miles long and 4 miles wide, isolated from all other habitable parts of the globe, the nearest land being about 2,000 miles away.

The Easter Island images are the most interesting of the archæological enigmas. There are over 600 of them on this island. Formerly

they stood in groups of six to twelve on platforms of hewed stone facing the sea; but in later years they have been thrown down during the civil strife among the natives. Most of them are to be found on hill-sides at the eastern end of the island. They were hewn out of volcanic tufa in the center of an extinct volcano, and transported over its sides, sometimes 3 or 4 miles, to their destination. The island is almost treeless, and the wonder is how savages could remove objects fragile as these, weighing from 3 to 30 tons each, over a country so rugged. The images exhibited in the National Museum, together with many other objects of ethnological interest, were procured during a twelve-days' visit.

There are now about 400 people living on the island, and they are of pure Polynesian stock. They know nothing whatever of the erection of these images, and it is quite possible that they are the descendants of a later migration. The following brief description of the objects in this collection may be found interesting:

No. 1. Stone image, weighing about 3 tons and about 8 feet in height by 4 in width, showing head, shoulders, and bust, but only outline of arms, the latter not distinct from the body, but a slightly raised surface carved straight down the side, with the forearms placed across the stomach at right angles, fingers touching and slightly interlaced. Below this point the general shape of the monolith is square.

No. 2. Block of red tufa, or calcareous rock, porous and brittle, slightly oval shaped, square on top, with slightly convex base. Supposed to be a crown for image.

No. 3. Image (head and shoulders) composed of or cut from substance resembling sandstone, measuring about 26 inches across shoulders and about 40 in height. Mouth small, lips very thin, nose and ears well defined and abnormally large. Eyes are simply deep recesses.

Nos. 4 and 5. Stone slabs, with hieroglyphics in reddish-brown and white color traced upon them. Average thickness about 3 inches. Length and width about 4 feet by 2.

Nos. 6, 7, and 8. Stone slabs, similar to, but smaller than, the above, and hieroglyphics more indistinct.

No. 9. Stone slab slightly larger and heavier than Nos. 4 or 5, with diagonal and horizontal lines.

No. 10. Small, irregular-shaped porous stone, with an indistinct hieroglyphic cut into it. Weighs about 25 pounds.

No. 11. Stone about three times as large as No. 10, having numerous hieroglyphics cut into it. Weight about 60 pounds.

No. 12. Small stone of about the same size and weight as No. 10, on which is a rude carving representing a human head and features.

Nos. 13, 14, 15, and 16. Small slabs, seemingly of iron ore, very brittle. No tracings, carvings, or hieroglyphics anywhere visible.

DIVISION OF ZOOLOGY.

DEPARTMENT OF MAMMALS.

The most important work has been the commencement of a re-arrangement of the exhibition hall. The cases previously in use were found unsuitable, and others of a new model have been substituted. An exceedingly fine series of buffalo skins and skeletons from Montana has been added to the collection, as the result of the expedition sent out under the leadership of Mr. Hornaday.

Among the most valuable accessions may be mentioned the gifts of Dr. J. C. Merrill, U. S. Army; Mr. John Gundlach, Mr. C. B. Cory, and Mr. Anastasio Alfaro. The Zoological Society of Philadelphia and the Central Park Menagerie of New York have presented several animals in captivity. From the old world accessions have been received from Mr. E. Hargitt, and from the Fish Acclimatization Society of Ballarat. Among aquatic mammals obtained, may be mentioned a skeleton of an adult male West India monk seal, *Monachus tropicalis*, purchased from Mr. H. A. Ward. Capt. M. A. Healy, of the U. S. Revenue Marine, presented three skins of the ribbon seal, *Phoca fasciata*. The U. S. Fish Commission secured some harbor seals off Wood's Holl, Massachusetts. Specimens of porpoise were presented by Lieut. Commander H. E. Nichols, U. S. Navy, and skeletons of the common dolphin, pygmy sperm whale, and short-finned blackfish were received from Mr. Bayley T. Barco, keeper of the U. S. Life-Saving Station at Dam Neck Mills, North Carolina. In this connection reference should be made to the continuance by the Superintendent and officials of the U. S. Life-Saving Service of their courteous co-operation in notifying the Museum of the stranding of cetaceans and in attending to the shipment of specimens to Washington.

Specimens representing 27 species have been added to the exhibition series during the year. There are now 752 specimens in the exhibition series and 4,088 in the study series. The alcoholic series numbers 2,971.

The curator, Mr. F. W. True, has been occupied most of the time available for study in completing his "Review of the Species of the Family *Delphinida*." He has also made a special study of the color variations of the puma, *Felis concolor*.

DEPARTMENT OF BIRDS.

The accessions received by this department during the year have been numerous and important, and the curator, Mr. Robert Ridgway, has made in his report special mention of 59 as being of peculiar interest. The amount of literary work accomplished is exemplified by the fact that 92 papers, based upon the collection, have been published during the year. Of this number, 59 were written by the curator and assistant curator, Dr. Leonhard Stejneger.

Mr. Ridgway has completed his series of analytical keys to North American birds, which is being issued by a Philadelphia publisher under

the title "A Manual of North American Birds." The assistant curator has continued his researches in Japanese ornithology, and reports upon several families have been already completed. These studies are of great importance, and are based on what is believed to be the richest collection of Japanese birds extant. The assistant curator has also worked up an interesting collection of birds from the island of Kanai, one of the Hawaiian group. That portion of the collection for which suitable provision has been made, is reported to be in excellent condition, and it is expected that during the next year it will be practicable to improve the condition of the exhibition series, which is suffering for want of insect-proof cases. The total number of specimens in this department is estimated to be 54,987, of which 40,875 belong to the reserve series, 7,000 are on exhibition, and 7,112 have been assigned to the duplicate series.

SECTION OF BIRDS' EGGS.

The collection of birds' eggs and nests was first properly arranged in 1884 by Capt. Charles E. Bendire, U. S. Army, who has since that year been acting as honorary curator. At that time the total number of eggs entered on the catalogue was 40,072, of which 8,000 beautifully prepared specimens have been contributed by Captain Bendire. There are now in the collection 45,938 specimens of eggs and 2,235 nests. An exhibition of birds' eggs would be of popular interest. Among the most generous contributors to the collection during the past year were Lieut. H. C. Benson, U. S. Army; Lieut. G. M. Stoney, U. S. Navy; Dr. A. K. Fisher, Department of Agriculture; Col. N. S. Goss; Capt. B. F. Goss; Mr. H. W. Henshaw; Mr. William Brewster; Mr. Loren W. Green, and Mr. J. Parker Norris.

The accessions for the year number 1,208 specimens, which have been classified and arranged. Measurements and records of 7,125 specimens have been made, and 235 nests have been mounted, labeled, and arranged for exhibition. A portion of the reserve series of eggs, which now includes 32,899 specimens, has also been relabeled and classified according to the nomenclature of the check-list recently published by the American Ornithologists' Union.

DEPARTMENT OF REPTILES AND BATRACHIANS.

Active work in this department, under the honorary curatorship of Dr. H. C. Yarrow, U. S. Army, has been confined chiefly to the preservation of new material and general routine work. The laboratory rooms have been closed during the fire-proofing of the west end of the Smithsonian building.

Some interesting accessions have been received during the year, notably of Korean serpents presented by Dr. N. McP. Ferebee, U. S. Navy; Mr. C. J. Herring; and Mr. D. Ridgway, of Wheatland, Indiana; and to this gentleman the Museum is indebted for previous co-operation.

Lieut. Commander H. E. Nichols, U. S. Navy; Ensign W. E. Safford, U. S. Navy, and Charles H. Townsend sent large collections. Hon. V. O. King, U. S. consul-general at Bogota, United States of Colombia, sent a large and valuable general collection, including some interesting species of snakes.

The curator has published a paper on the "Recurrence of Symptoms of Poisoning after Snake-bites." He has also prepared a paper entitled "Poisonous Reptiles of the United States." Prof. E. D. Cope, for several years a collaborator of the Smithsonian Institution, prepared a "Catalogue of the Reptiles and Batrachians of Central America and Mexico." This is now in the hands of the printer and will be published as Bulletin 32 of the U. S. National Museum.

Professor Cope has also prepared a monograph of the Batrachians of North America, the manuscript of which has been sent to the printer, and which will be published as Bulletin 34, U. S. National Museum.

The collection of reptiles is in good condition, and now includes 27,542 specimens.

DEPARTMENT OF FISHES.

The annual rate of increase of specimens in the collection of fishes continues to be exceedingly large. In 1882, Dr. T. H. Bean, the curator, reported that the collection contained not less than 50,000 specimens, and in the present year the total number is estimated at 100,000. The recent increase is largely due to the U. S. Fish Commission, which has contributed twelve of the most important accessions received during the year, while many other interesting contributions have been made by agents of the Fish Commission in various parts of the country. The officers of the Navy Department have, as usual, co-operated zealously with the interests of this department, and five very interesting collections have been received in this way. The curator has, during the year, been relieved of his duties as editor of the "Proceedings" and "Bulletins," a duty which he undertook many years ago.

The literary work of this department has been extensive, and in the bibliography there are noticed no less than thirty-six papers which have been published during the year, based upon the collection.

The curator is engaged in several investigations, one of the most important of which has for its object the publication of a synopsis of the Salmon family of North America, their study and identification.

There are now 34,000 specimens of fishes in the exhibition series, 41,000 in the reserve series, and 25,000 duplicates.

Dr. Bean, at the request of Professor Baird, accompanied the U. S. Fish Commission schooner *Grampus* in its cruise along the middle and southern Atlantic coast with a view to investigating the spring mackerel fishery, in the months of April and May. A report of this expedition will be published by the U. S. Fish Commission,

DEPARTMENT OF MOLLUSKS (INCLUDING CENOZOIC INVERTEBRATE FOSSILS).

From the report of Dr. W. H. Dall, curator of this department, it will be seen that seventy-five accessions were received during the year, including some 32,000 specimens. Some are of great extent and value, those perhaps most worthy of mention being the series of deep-sea mollusks dredged by the U. S. S. *Blake* and presented by Prof. Alexander Agassiz, the types of a report on the mollusks of the *Blake* expedition by Mr. Dall, and a valuable series of mollusks dredged in the Gulf of Mexico and the Bahamas, presented by Dr. W. H. Rush, U. S. Navy. The curator has made a special study of the mollusks of the *Blake* collection. The investigation of the mollusks from later Tertiary beds of South Florida is still in progress. Mr. Dall has also made studies upon a collection of mollusks obtained by the Jeannette Expedition at Bennett Island, has carried on his work upon the general Floridian and Gulf fauna, and on the geology of South Florida, besides working up several collections made by L. M. Turner in Labrador, by Nicholas Grebnitzki in Bering Sea, and by himself in several parts of northern Alaska.

Dr. R. E. C. Stearns, the adjunct curator, has been engaged, in addition to his regular work, in the study of the fossil *Tryonias*, of *Teredo*, and of the *Phoridae*.

Very notable advances have been made in the arrangement and cataloguing of the mollusca, as is shown by the fact that 10,530 catalogue entries have been made, which represent the final classification of about 32,000 specimens.

DEPARTMENT OF INSECTS.

Progress has been made in the arrangement of the collections of insects. The curator, Prof. C. V. Riley, states in his report that the arrangement of the Lepidoptera from the *Rhopalocera* to the end of the *Arctiida* has been completed; the material embracing the order of *Diptera* has been separated into families. The collection of *Arachnida* has been re-arranged. The work of labeling and separating the duplicate material in the suborder *Heteroptera* has been completed.

Many important accessions have been received from the correspondents and agents of the entomological division of the Department of Agriculture, and conspicuous among them is the valuable collection made by Mr. Albert Koebele, in California, including several thousand specimens. Mr. E. A. Schwarz presented about 300 specimens of Coleoptera. In all, 102 accessions have been received during the year, representing, exclusive of the collection of the assistant curator, Mr. J. B. Smith (which has become the property of the Museum), at least 10,000 specimens. The exhibition series now includes 7,878 specimens (2,637 species), besides a large number of drawings. There have been made 101 entries in the catalogue of the department during the year.

Work has been continued by the curator and his assistant in the study of the *Noctuidæ*,* and the latter has investigated the Museum material in the lepidopterous family *Saturniidae*, and also the genus *Callimorpha*.†

DEPARTMENT OF MARINE INVERTEBRATES.

Mr. Richard Rathbun, the curator of this department, reports that advances have been made in the permanent arrangement of the general reserve collection during the year, and that much material has been prepared for the display series. He has also during the year begun the preparation of a card catalogue of the identified material. This affords an excellent means of reference, and renders it possible to determine at a glance the presence or absence of a given species in the collection. During the summer of 1886 the curator completed, for the Fish Commission, a report upon the surface water temperatures of the Atlantic coast of the United States. The deep-water and littoral *Madreporaria* and *Hydracorallæ*, obtained by the U. S. Fish Commission steamer *Albatross* during 1884, 1885, and 1886, have been examined and identified. The determination of nearly all of the corals of the genera *Madrepora*, *Porites*, and *Synareæa* has been completed, and reports based thereupon have been prepared for publication in the Proceedings of the Museum. Mr. Rathbun is now engaged upon a revision of the star-fishes belonging to *Asterias* and the allied genera; and a description of the species *Heliaster*, with photographic plates of all the known forms, has been completed.

The accessions of the year number fifty-five, the largest and most important consisting of the material brought in by the Fish Commission steamer *Albatross* during the summer and fall of 1886, and the collection of 484 specimens of sponges and 266 specimens of corals, made by Dr. G. Brown Goode in Bermuda, in 1877, for the Wesleyan University at Middletown, Connecticut, and now sent to the National Museum in exchange.

There have been made 5,252 entries in the catalogue of this department, of which 996 represent Crustacea, 2,611 Worms, 130 Bryozoa and Ascidians, 1,412 Echinoderms and Cœlenterates, and 103 Sponges and Protozoans.

Thirty-one sets of duplicate series of marine invertebrates from the collections of the U. S. Fish Commission were sent to colleges and schools in various parts of the United States, and special sets were prepared for the Museum of Comparative Zoology at Harvard College and for the American Museum of Natural History in New York.

DEPARTMENT OF COMPARATIVE ANATOMY.

The collections in this department are under the care of Mr. F. W. True, assisted by Mr. F. A. Lucas, and are increasing very rapidly. The catalogue shows 468 entries of birds, 330 of mammals, 10 of reptiles

* See Proc. U. S. Nat. Museum, vol. 10, pp. 450-479.

† See Proc. U. S. Nat. Museum, vol. 10, pp. 338-352.

and batrachians, and 4 of fishes. The mammalian series is at present much the largest, and that of alcoholic birds, important for anatomical purposes, contains many forms.

Reference to the statement of work accomplished by the osteological preparator* will show the number of specimens which have been prepared or mounted. The Zoological Society of Philadelphia and the Central Park Menagerie in New York have generously continued to send specimens of animals which have died in captivity.

Among the principal accessions may be mentioned a gorilla, *Gorilla savagei*, obtained from the Museum d'Histoire Naturelle in Paris, a fine example of Caribbean seal, *Monachus tropicalis*, and a small whale, *Kogia breviceps*,† which was secured through the co-operation of Capt. B. T. Barco, of the life-saving station at Dam Neck Mills, in Virginia. Numerous skeletons and skulls of the American buffalo, *Bison americanus*, and of other mammals and of birds, were added to the collection as a result of the successful expedition sent out by the Institution to Montana under the charge of Mr. William T. Hornaday.

The exhibition series now includes nearly 500 specimens.

DEPARTMENT OF INVERTEBRATE FOSSILS (PALEOZOIC).

The work of this department, under the curatorship of Mr. C. D. Walcott, of the U. S. Geological Survey, has made marked progress. Thirty-six accessions, aggregating 4,009 specimens, have been received and, for the most part, identified. Many of these accessions consisted of materials gathered by officers of the U. S. Geological Survey during the summer of 1886, and duly transferred to the custody of the Museum by Major Powell, the Director of the Survey. Dr. R. R. Gurley has been designated to act as assistant, and the curator reports rapid progress in the classification and arrangement of the material. He further states that a very good representative collection for exhibition will be ready as soon as exhibition cases can be supplied. Mr. Walcott has continued his studies upon the Cambrian faunas of North America, and during the year has published in the American Journal of Science a memoir relating to the classification of this system.

DEPARTMENT OF INVERTEBRATE FOSSILS (MESOZOIC).

Dr. C. A. White, of the U. S. Geological Survey, continues his work upon the collection of mesozoic fossils. He states that during the year he has been enabled to complete the card catalogue of all the Museum materials in his custody. The entire collection is now ready for exhibition, and it is unfortunate that no space is at present available for this important and carefully identified material. The accessions during the year numbered twelve, and 1,033 entries were made in the catalogue.

* See page 40.

† See report of Department of Mammals.

DIVISION OF BOTANY.

FOSSIL AND RECENT PLANTS.

The collections of fossil and recent plants continue under the care of Mr. Lester F. Ward, of the U. S. Geological Survey, assisted by Mr. F. H. Knowlton. Much of the material in the collection of fossil plants is in the hands of Prof. Leo Lesquereux, of Columbus, Ohio, for determination, but nothing has recently been published by him. Mr. Knowlton has been carrying on an investigation of the microscopical structure of the wood and lignite of the Potomac formation. The results of his work are to be published in one of the bulletins of the U. S. Geological Survey.

The collection of fossil plants now contains 8,462 specimens.

The collection of recent plants has been greatly enriched during the year, notably by the addition of the material collected by Dr. Edward Palmer in southwestern Mexico. This includes about eight hundred species, of which one fifth are new to science. Mr. Pringle made valuable contributions to the fauna from Mexico, and from Mr. S. Applegate was received a small collection of Alaskan plants. Much interesting material which was exhibited at the New Orleans Exposition, has been added through the courtesy of the Government of Costa Rica.

The herbarium of the late Mr. O. E. Pearce has been received during the year. This includes over 600 finely mounted species, together with a large number of duplicates. Other collections of interest and value were received from Dr. J. C. McCormick, Mr. J. W. Johnson, and Prof. Alfred Dugès.

Active work in this department has been mainly confined to the determination of the material received. It is estimated that there are 32,000 specimens in the collection. Thirty entries have been made in the catalogue during the year.

DIVISION OF GEOLOGY.

DEPARTMENT OF MINERALS.

The honorary curator, Prof. F. W. Clarke, chief chemist of the U. S. Geological Survey, reports satisfactory growth in the collections under his charge.

The mineral collection received some remarkable specimens of quartz, stibnite, and amber from the Educational Museum at Tokio, Japan. A collection of 74 specimens of Swedish minerals collected by L. J. Igelström was purchased.

Among the important accessions to the series of gems were those from Mr. C. S. Bement, of Philadelphia, Mr. Thomas Wilson, of Washington, and Mrs. Spencer F. Baird. From the Treasury Department was received a collection of 133 small diamonds and 150 pearls, which were presented in 1840 to President Van Buren by the Imaum of Muscat.

The collection of meteorites now numbers about 301 "falls," of which 141 have been obtained during the year.

The celebrated collection of Prof. C. U. Shepard, jr., numbering 101 specimens, has been deposited during the year.

Researches have been made by Professor Clarke, and under his direction, upon the micas, the natural borates, and the tourmalines belonging to the Museum collection.

There are now 3,238 specimens on exhibition, 5,404 in the study series, and 8,530 duplicates, which, together with the Willcox collection of minerals and the Shepard collection of meteorites, make a total of 18,601 specimens in the care of this department.

DEPARTMENT OF LITHOLOGY AND PHYSICAL GEOLOGY.

Mr. George P. Merrill, curator, has devoted the greater part of his time to the arrangement of the exhibition and reserve series, both of which have been greatly extended during the year. Of the reserve series 5,687 specimens are on exhibition, 2,720 of which are examples of building stones, while 1,893 belong to the educational series of rocks and rock-forming minerals. Mr. Merrill has had permission to do a portion of his work in the petrographical laboratory of the Johns Hopkins University in Baltimore, and has there examined several hundred microscopical slides of the sections of rocks, and has thus been enabled to arrange a large mass of hitherto unclassified material which had been accumulating for several years. Mr. Merrill has, at his own cost, made expeditions to California and Montana, and has gathered much desirable material, described in the accession list accompanying this report (Section v). In his report he makes mention of 13 accessions received during the year, which are of special value. The total number of specimens in his department is estimated at 21,500.

DEPARTMENT OF METALLURGY AND ECONOMIC GEOLOGY.

The time of the curator, Mr. Fred. P. Dewey, has been in part devoted to the preparation of a preliminary descriptive catalogue of the collections.

The accessions of the year have consisted chiefly of material sent for examination and report, and 186 specimens have been examined. Six hundred and seventy-one entries have been made in the catalogue. There are now about 49,000 specimens in the collection, of which 18,000 are on exhibition.

E.—REVIEW OF THE ADMINISTRATIVE WORK.

PROGRESS OF GENERAL AND INCIDENTAL WORK.

TRANSPORTATION AND STORAGE.

Of the total number of boxes, packages, barrels, tanks, etc., received during the year, which was 38,367, no less than 3,798 contained material for the Museum.

The registrar, Mr. S. C. Brown, continues to act as transportation clerk for the Smithsonian Institution.

During the year 436 boxes and packages have been entered on the storage records. The temporary storing of material, it may be noted,

is of very great convenience to the curators, who, upon the arrival of bulky accessions, may not be prepared to receive them immediately into their laboratories.

LIBRARY.

Mr. John Murdoch* has furnished the following statement concerning the operations of the library.

The work of the library has been carried on according to essentially the same methods as during the preceding years.

The total number of publications (exclusive of regular periodicals) added to the library during the year was 1,511—391 volumes of more than 100 pages, and 1,120 pamphlets. Of these, 237 volumes and 711 pamphlets were retained for the use of the Museum from the accessions of the Smithsonian Institution. The remainder were obtained as usual by gift, and less frequently by purchase. As in previous years, the chief donor to the library was Prof. S. F. Baird, to whom the library is indebted for 17 volumes and 109 pamphlets. Next in importance as contributors are Mr. Robert Ridgway, 49 pamphlets; Mr. W. H. Dall, 46 pamphlets; the Smithsonian Institution, 14 volumes, 18 pamphlets; Prof. J. O. Westwood, of Oxford, England, 27 pamphlets (a complete set of his shorter archaeological writings); and the United States Fish Commission, 3 volumes and 19 pamphlets.

During the year 4,350 books were borrowed from the library, and 4,396 returned.

The card catalogue by authors has been continued, and 1,647 titles have been added to it during the year. A catalogue by subjects is a great desideratum, but it is impossible to begin it with the force now at command.

The condition of the sectional libraries remains practically unchanged since the last report.

The covering of pamphlets with the binders, described in the last report, has been continued, and 2,111 have been covered during the year. On June 24 we received a supply of Randolph pamphlet-boxes of the standard quarto and octavo sizes. It is intended to keep the covered pamphlets in these, grouping together, for instance, all the pamphlets by the same author in one of these boxes, which then forms practically a book, and can be put in its proper place on the shelf.

On the establishment of the Smithsonian reading-room, soon after April 1, the current volumes of nearly all the important periodicals not belonging to the sectional libraries, were transferred to it. This affords a long-desired opportunity for the display of the recent numbers of these publications, and as the periodicals in the reading-room are not allowed to circulate until the volume is complete, all readers have an opportunity of consulting them.

No changes were made in the force employed in the library until April 1. At this date, in consequence of the reorganization of the

* Appointed Librarian of the Smithsonian Institution April 1, 1887.

Smithsonian library, Mr. F. W. True resigned the position of librarian, and the assistant librarian, Mr. Murdoch, became librarian of the Smithsonian Institution, in charge also of the Museum library, with Mr. N. P. Scudder as assistant librarian.

The chief need of the library is more room for the storage of the files of periodicals. The room now available is scarcely sufficient to provide for the regular growth of the series now kept, and want of room is a serious hindrance to the acquisition of the files of important periodicals.

DISTRIBUTION OF DUPLICATES, AND EXCHANGES.

The policy of the Smithsonian Institution in reference to the distribution of its duplicate material has frequently been emphasized in its annual reports. It has always been the desire of the Institution to utilize this material by sending it to colleges, museums, and individuals, either as a gift or in exchange, and thus to extend as widely as possible the means of diffusing a knowledge of the natural history of this country. In the Smithsonian report for 1859* Professor Henry wrote: "The object of the Institution in obtaining so large a number of duplicates is that they may be distributed for the advancement of knowledge to persons who may be engaged in original investigations in natural history, and also to colleges for the purpose of education." In the same place he says: "Although the primary object of the Institution is not educational, yet the Museum is arranged with special reference to the study of the elements of different branches of science; and the distribution of the extra specimens will furnish the means of diffusing a knowledge of natural history more generally throughout the country."

During the last few years each department in the Museum has been under the care of a specialist, but in former years, when the Secretary of the Institution acted as the sole keeper of the Museum, the collections, as soon as they were received, were sent away to various specialists, who undertook to identify the specimens, which were duly returned, labeled, to the Institution.

Thus in the early days of the Museum the value of the collections depended in large part upon the willingness of specialists to co-operate, and to them distributions of material were of course most readily made. Professor Henry, in the annual report for 1861† states that up to that time 80,000 specimens had thus been distributed. He adds: "When it is considered that all these have been named and labeled by naturalists admitted to be of the highest authority in their respective departments, and that all have thereby the character and value of types, it will be readily understood how much their systematic and judicious distribution by the Institution all over the world must conduce to the advancement of science."

As a result, however, of the more thorough organization of the Museum at the present time, the determination of material is for the most part

*Page 50.

†Page 63.

performed within the walls of the Museum, and therefore extraneous co operation is no longer so necessary a feature of the work of the establishment.

The applications for specimens this year numbered 83, most of which were filled, besides 46 which remained on file from previous years. The distributions for this year consist for the most part of material sent as gift to needy colleges and museums, or in exchange for material received. These amounted to 327 packages, among which were included 3,460 specimens of marine invertebrates (32 sets), 1,573 rocks, 1,462 birds, 1,168 minerals, 1,029 mollusks, 555 paleozoic fossils, 543 ethnological objects, 165 ores, 148 birds' eggs, 133 mammals, 106 reptiles, 94 fishing implements, and 84 fishes. Forty-nine boxes and one package, containing materia medica specimens, animal products, pottery, and fossil plants, were also included in the distribution. In addition to this, 13 sets of plans and drawings of Museum cases and bottles, 95 photographs of Museum specimens, and 9 musical instruments were also given or lent.

Among the most important distributions of the year have been those of the buffalo heads, skins, and skeletons which formed a part of the result of the Smithsonian exploration into Montana, and which were presented to corporations and individuals who had materially assisted in bringing the expedition to success. A large number of axolotls, for the most part presented to the Museum by Dr. R. W. Shufeldt, U. S. Army, were given away to various applicants for purposes of study.

FOREIGN EXCHANGES.

A collection of 112 specimens (105 species) of birds and 24 mammal skins was sent to the museum of the municipal library in Kurrachee, India, in exchange for collections of drugs, reptiles, and mammals received. A skull and 11 bones of *Ithyina* together with additional skeletons of mammals and birds and some insects, were sent to M. Beauregard, of the Museum of Natural History in Paris, in exchange for 18 mammal skeletons and a small series of insects received. Fourteen pieces of Chiriqui pottery were sent to M. Lauth, director of the establishment of Sèvres, France, in exchange for material received; and a bust of Osceola and a Sioux head-dress were transmitted to the minister of public instruction for the Trocadero Museum in Paris, in part exchange for a valuable collection of Sèvres porcelain received from the French Government. The negotiations which for some time have been pending with the Annecy Musée, Haute-Savoie, have been completed during this year by the transmission of a collection of ethnological objects and a series of fossils in exchange for a collection of minerals, rocks, etc., received last year. A buffalo-skin was sent to Dr. Tor Helliesen, curator of the zoological department of the Stavanger Museum in Norway. A sea-lion skin was sent to the Bergen Museum in Norway. A small and varied collection of fossils, moa bones,

etc., was received from Mr. S. H. Drew, of Wanganui, New Zealand, and in exchange an equivalent in ethnological material has been sent. A series of the bones of *Rhytina* was sent to Mr. J. W. Clark, of the Museum of Zoology and Comparative Anatomy at Cambridge, England, in part exchange for some valuable skeletons received at the close of the London Fisheries Exhibition in 1883. An exchange of mammal skins has been made with Prof. Tycho Tullberg, of Upsala, Sweden.

In addition to these exchanges correspondence has been carried on with several museums with a view to arranging exchanges. Prof. S. Hertenstein, of the Imperial Zoological Museum in St. Petersburg, Russia, has offered to send fishes and shells in exchange for American fishes. Dr. A. Strauch, director of that museum, has been invited to exchange Russian and Central Asiatic mammals for mammals from North, Central, and South America. An exchange of fishes is being arranged with Prof. T. Jeffery Parker, of the Otago University Museum, at Dunedin, New Zealand. Dr. Serrurier, director of the National Ethnological Museum of the Netherlands, in Leyden, has offered African ethnological material in exchange.

The arrival of specimens of tin-bearing material, together with systematic series representing the mode of occurrence and extraction, and of mammals, from L. Wray, esq., curator of the Perak Museum in the Straits Settlements, in exchange for mineralogical specimens, is awaited with much interest. Professor Bernardin, of the Commercial and Industrial Museum in the College of Melle, near Ghent, has been asked to send samples of commercial products. D. Morris, esq., assistant director of the Royal Gardens at Kew, in England, has made application for specimens of American woods. These will be put aside for that establishment as opportunity offers. Dr. Ernest Bayet, of Brussels, has requested an exchange of fossils, desiring quaternary and pliocene material. In behalf of the department of Mollusks this Museum has written to the director of the Cape Town Museum for a series of land, fresh-water, and marine shells of that region, offering in exchange any desired material. For the same department application for a series of Storms shells has been made to the director of the Brussels Museum. A letter has been addressed to Hon. St. John Larnack, minister of marine Wellington, New Zealand, asking for specimens in any department of zoology, an offer having been voluntarily made to send us any desiderata which could be supplied, in return for whitefish ova transmitted by the U. S. Fish Commission. M. Milne-Edwards, of the Museum of Natural History in Paris, has offered duplicate material from the dredgings of the *Travailleur*.

PUBLICATIONS.

The report on the operations of the Museum for 1884 was issued in October, 1886, as Smithsonian Report, Part II, and was the first bound volume published as a report on the Museum. This book consists of

ix+458 pages. A new feature of this report was the inclusion of scientific papers based upon collections in the Museum. These are six in number and bear the following titles :

- I. Throwing-sticks in the National Museum ; by Otis T. Mason ; 12 pages ; 17 plates.
- II. Basket-work of the North American Aborigines ; by Otis T. Mason ; 16 pages ; 64 plates.
- III. A study of the Eskimo bow in the U. S. National Museum ; by John Murdoch ; 10 pages ; 12 plates.
- IV. On a Spotted Dolphin, apparently identical with the *Prodelphinus doris*, Gray ; by Frederick W. True ; 8 pages ; 6 plates.
- V. The Florida Muskrat, *Neofiber Alleni*, True ; by Frederick W. True ; 6 pages ; 3 plates.
- VI. On the West Indian Seal, *Monachus tropicalis*, Gray ; by Frederick W. True and F. A. Lucas ; 5 pages ; 3 plates.

The manuscript of the report for 1885-'86, the first report embracing an entire fiscal year, has been sent to the Printing Office.

Mr. A. Howard Clark has been appointed editor of Proceedings and Bulletins. This work has for many years been well performed by Dr. T. H. Bean, in addition to his regular duties as curator of fishes.

The eighth volume of the Proceedings of the U. S. National Museum, for the year 1885, appeared in October. It contains 78 contributions in 40 signatures by 36 authors, 14 of whom are officers of the Museum. Twenty-five of the papers related to fishes, 22 to birds, 12 to marine invertebrates, 6 to mammals, 3 to rocks and minerals, 3 to physiological subjects, 2 to botany, and 1 each to ethnology, entomology, paleontology, metallurgy, and materia medica. The report is illustrated by 25 plates and 15 cuts. The Appendix contains circulars 32 and 33 of the National Museum, the former being "A classification of the materia medica collection of the U. S. National Museum" previously published by Dr. James M. Flint, U. S. Navy, and extended by Dr. Henry G. Beyer, U. S. Navy, and the latter entitled "Notes on the Preparation of Rough Skeletons, by Frederic A. Lucas."

The ninth volume of the Proceedings of the U. S. National Museum, 1886, has been issued only in signatures, of which a list is published in Section IV of this report. The bound volume will soon be ready for distribution.

Of the tenth volume of Proceedings of the U. S. National Museum, for the year 1887, only six signatures (the sixth dated May 17) had appeared up to the close of the fiscal year now being reported upon.

Bulletin 31, SYNOPSIS OF THE NORTH AMERICAN SYRPHIDÆ, by Samuel W. Williston, M. D., Ph. D., was issued in May, 1887, and contains xxx+335 pages. It is illustrated by 12 plates. The subject is discussed in three parts, of which the first is devoted to classification, the second to descriptions, and the third to habits, structural characters, geographical and geological distribution, and chronological list of genera.

Bulletin 32, CATALOGUE OF BATRACHIANS AND REPTILES OF CENTRAL AMERICA AND MEXICO, by Prof. E. D. Cope, is in type and ready for printing.

The manuscript for Bulletin 33, entitled CATALOGUE OF MINERALS AND SYNONYMS, by Thomas Egleston, as well as that for Bulletin 34, CATALOGUE OF BATRACHIANS AND REPTILES OF NORTH AMERICA, by Prof. E. D. Cope, has been sent to the Printing Office.

In Section IV of the report will be found a list of the publications of the Museum, and also a bibliography of the papers by officers of the Museum and by others whose writings have a bearing upon Museum material. The authors of these papers number 84, 32 of whom are connected with the Museum, 10 being honorary officers. The papers number 345, and are thus distributed under the following subjects:

Subjects.	By Museum officers.	By other investigators.	Total.
Textiles	1	0	1
Foods	1	0	1
Materia medica	7	0	7
Naval architecture.....	1	0	1
Fisheries	9	5	14
Ethnology.....	37	6	43
Antiquities	5	0	5
Mammals.....	12	1	13
Birds	59	37	96
Reptiles and batrachians.....	2	1	3
Fishes.....	5	20	25
Mollusks (including crustaceans).....	5	4	9
Insects	50	0	50
Invertebrates	5	3	8
Invertebrate fossils	11	1	12
Plants.....	12	0	12
Minerals.....	4	0	4
Lithology and physical geology	6	0	6
Exploration	2	0	2
Chemistry	3	0	3
Metallurgy	1	0	1
Physiology and histology	0	6	6
Taxidermy	2	1	3
Biography	5	0	5
General.....	15	0	15
Total	260	85	345

VISITORS.

The total number of visitors to the National Museum during the fiscal year ending June 30, 1887, was 216,562, giving a daily average of 691+, and to the Smithsonian building, 98,552, giving a daily average of nearly 315.

Table showing the number of visitors to the Museum and Smithsonian buildings since 1881.

Year.	New Museum building.	Smithsonian building.
1881	*150,000	.....
1882	†167,450	152,744
1883	202,188	104,823
1884	195,322	91,130
1885 (January-June)	107,365	60,428
1885-'86	174,225	88,960
1886-'87	216,562	98,552
Total number of visitors	1,213,117	596,637

* Estimated on basis of register.

† Estimated on basis of attendance from February 8 to December 31.

STUDENTS, LECTURES, AND MEETINGS OF SOCIETIES.

As in past years, the Museum has offered facilities to several students, who have in some instances rendered a partial equivalent by volunteer work upon the collections.

Mr. Walter H. Brown spent six weeks with the Department of Comparative Anatomy for the purpose of studying the methods of preparing and mounting osteological specimens.

In the Department of Insects volunteer service was rendered by Mr. S. Davis, of Washington, and Mr. W. H. Crane, of Cincinnati, whose assistance was utilized chiefly in the arrangement of the Diptera and in the synoptic collection of Coleoptera. Prof. P. R. Uhler, of Baltimore, having offered to arrange and name the insects of the family *Capsidae*, the material was sent to him for that purpose.

Paul Pelseneer, of the museum at Brussels, applied for certain species of pteropod mollusks for study. Certain Pacific specimens and copies of colored drawings, made from life by Mr. Dall while in the North Pacific, were lent to him.

Mr. Delano Ames, of Washington, served as a volunteer in the department of Marine Invertebrates during the months of May and June. Prof. A. E. Verrill, of Yale College, assisted by Misses A. J. and C. E. Bush, and Mr. Sanderson Smith, Prof. J. Walter Fewkes, of the Museum of Comparative Zoology, Cambridge, Massachusetts; Prof. S. I. Smith, of Yale College, Prof. L. A. Lee, of Bowdoin College, Prof. E. Linton, of Washington and Jefferson College, Pennsylvania, and others have rendered valuable aid to this department by researches in special directions.

In the department of Minerals volunteer service was rendered from July to November, 1886, by Mr. H. H. James.

An examination of the entire collection of deer antlers, in connection with the question of bilateral asymmetry in the class Mammals, was made by Dr. Harrison Allen.

In the department of Ethnology Paymaster E. B. Webster, U. S. Navy, rendered valuable service.

Among the investigators who have utilized the ichthyological collections of the Museum in the preparation of papers, etc., were President David S. Jordan, of Indiana University, and his assistants, and Prof. John A. Ryder, of the University of Pennsylvania.

The gallery of the department of Birds was thrown open to the members of the American Ornithologists' Union, who held their annual meeting from November 16 to 18, and daily use was made of the library and collections by these gentlemen in connection with the objects of the meeting and their researches as ornithologists.

Mr. Anastasio Alfaro was sent to Washington by the Government of Costa Rica in October, 1886, to study the methods of the National Museum. This gentleman was shown every courtesy, especially by the department of Birds, in which he was particularly interested, and every possible facility was afforded him for familiarizing himself with the methods pursued by the Institution.

In the photographic laboratory instructions were given by Mr. T. W. Smillie to Lieutenants Schaefer, Rogers, Bolles, and Werlich, of the U. S. Navy; Messrs. Merrill and Hornaday, of the Museum; Mr. Thomas Lee, U. S. Fish Commission; the photographer of the U. S. Coast Survey, and to Dr. May King, a young Chinese lady who is preparing herself for a career as a medical missionary and scientific student in her native land.

Instructions in taxidermy were given by Mr. W. T. Hornaday to Prof. L. L. Dyche, of the University of Kansas, who served as an unsalaried volunteer in the department for the sake of the experience required.

Mr. L. M. McCormick asked for and obtained access to the collection of fishes and ichthyological literature, to aid him in the identification of a collection of fishes belonging to Oberlin College.

The use of the lecture hall has as usual been granted for a series of lectures delivered on Saturday afternoons, and in some cases on Wednesday evenings, under the joint auspices of the Biological and Anthropological Societies of Washington. These were largely attended. Some of the lectures had direct reference to the work of the Museum, and were illustrated by specimens.

The programmes of the two parts of this course are here given :

PART I.

March 12.—General A. W. GREELY, U. S. Army: Animals of the Arctic Regions.

March 19.—Capt. C. E. DUTTON, U. S. Army: Earthquakes.

March 23.—Mr. W. J. MCGEE: The Charleston Earthquake.

March 26.—Prof. OTIS T. MASON: The Natural History of Human Arts.

April 2.—Dr. B. E. FERNOW: Our Forestry Problem.

April 6.—Mr. THOMAS WILSON: Prehistoric Man in Western Europe.

PART II.

April 16.—Dr. EDWARD M. HARTWELL: The Aim and Effects of Physical Training.

April 20.—Dr. FRANK BAKER: Facial Expression.

April 23.—Miss H. C. DE S. ABBOTT: The Chemistry of the Higher and Lower Plants.

April 30.—Prof. HARRISON ALLEN: Rights and Lefts.

May 4.—Prof. S. P. LANGLEY: Sunlight and the Earth's Atmosphere.

May 7.—Dr. J. H. BRYAN: The Mechanism of the Human Voice.

During the year the following-named societies have, by permission of the Secretary of the Smithsonian Institution, held their meetings in the Museum lecture hall: The National Dental Association, July 27 to 29, inclusive; The Biological Society of Washington,* annual meeting, January 22; National Convention of Superintendents of Schools, March 15 to 17, inclusive.

CURRENT ADMINISTRATIVE WORK.

FURNITURE, SUPPLIES, AND ACCOUNTS.

The following statement in regard to the cases and other furniture, supplies, and accounts of the Museum, covering the fiscal year 1886-'87, has been prepared by Mr. W. V. Cox, chief clerk.

The U. S. National Museum is supported by three appropriations annually voted by Congress; one being for preservation and increase of collections, one for furniture and fixtures, and one for heating, lighting, electrical, and telephonic service.

The principal appropriation made for the Museum is the one for the Preservation of Collections. The wording of the act of Congress making this appropriation for the year ending June 30, 1887, is as follows:

PRESERVATION OF COLLECTIONS OF THE NATIONAL MUSEUM: For the preservation, exhibition, and increase of the collections received from the surveying and exploring expeditions of the Government, and from other sources, including salaries or compensation of all necessary employés, one hundred and six thousand five hundred dollars.

Out of this appropriation, therefore, are paid the salaries of curators, scientific assistants, clerks, and other employés, the nature of whose work is properly chargeable to it. This service amounted during the year to \$95,133.70.

The greatest number of employés on the roll in any one month was 126, in January, 1887; the smallest number was 106, in April of the same year.

The highest salary paid was \$300 per month; the lowest was \$20, paid to an attendant; the average salary being \$65.

The further disbursements of this fiscal year were as follows: \$1,768.69 was expended for stationery; \$281.94 was expended for books; \$4,847.63 for specimens; \$2,619.61 for general supplies; \$1,765.37 for freight and cartage; which, with the total of \$95,133.70 paid for services, left a balance of 2 cents to be "covered into the Treasury."

* The regular meetings were held by this society every other Saturday evening until March 19, after which the society met in the Cosmos Club rooms.

The appropriation for Furniture and Fixtures for the year ending June 30, 1887, was \$40,000.

Out of this sum there was expended \$18,603.80 for exhibition cases of different designs, screens, wing-frames, insect-boxes, blocks, tablets, bird-stands, drawings for cases, furniture for offices, glass, brackets, locks, and other necessary fittings and appliances.

During the same time \$2,139.04 was spent for lumber; \$598.35 was spent for paints, oils, brushes, etc.; \$161.40 was spent for glass vials and containers for specimens; \$191.41 was spent for apparatus, appliances, etc., for laboratory, and exhibition halls; \$941.28 was spent for miscellaneous purposes; making a total of \$22,635.28.

The following fittings, appliances, etc., were made or furnished during the year by persons outside the Museum:

10 mahogany unit table cases	\$750.00
36 mahogany table cases (sloping)	1,475.25
10 table cases with storage base	1,295.00
1 mahogany table case (special)	125.00
16 mahogany Kensington cases	1,040.00
20 mahogany Kensington cases	1,900.00
6 mahogany wall cases	1,489.00
20 pine unit tables	504.40
1 large walnut cabinet	250.00
2 cherry cabinets	250.00
4 white-pine herbarium cases	236.00
4 standard book-cases	64.00
5 white-pine wood cut cases	47.50
1 cherry case	15.00
4 mahogany table screens	288.00
1 half-unit ebonized table screen	45.00
102 oak frames	49.25
32 ebonized wing-frames	82.50
5 mahogany wing-frames	15.00
28,538 pasteboard trays, boxes, and covers	543.87
1,664 white-pine blocks, tablets, etc	124.80
180 wire bird stands	14.58
222 insect-boxes	286.25
989 lights of glass—plate, crystal, and hammered	3,975.98
963 locks and rods	1,312.85
254 brackets	23.75
1,985 file-holders	223.91
Furniture, etc., for offices	743.63
Drawings for cases, etc	130.00
Traveling expenses to inspect cases, etc	11.86
Interior, and other fittings	1,266.42

There was also expended out of this appropriation for wages of mechanics and laborers, salaries of property clerk, copyists, and other necessary employés, \$17,289.75, leaving an unexpended balance of \$74.97.

The average monthly roll on furniture and fixtures was \$1,440.81. The greatest number of employés in any month was 27, the smallest 20; the average number being 25.

The highest salary was \$110, the lowest \$30. The wages of carpenters, painters, and laborers were the same as paid for work of like nature in other departments of the Government, the average per individual on this roll being \$57.63.

The mechanics have been kept busy with the varied work of the Museum. When necessary to have cases of new design or of peculiar form made, it has often been found economy of both time and means, sometimes even with working drawings, to have a sample prepared in the Museum shop before finally awarding the contract. Our men have remodeled numerous old cases, and have built many new ones, as shown by the accompanying list.

The following cases, screens, etc., were made in the Museum shop between June 30, 1886, and July 1, 1887:

10 mahogany alcove cases.	2 stationary screens with sliding doors.
4 mahogany pillar cases.	2 large stationary screens.
4 glass screen, sloping cases.	4 poplar screens, between arches.
1 glass case, special form.	24 pine screens, between arches.
1 ebonized case, special form.	18 pedestals.
4 unit cases.	4 pyramids, pedestals.
4 white-pine standard book-cases.	4 gun-racks.
13 walnut bases.	8 oak frames.
7 pine bases.	16 pine shelves and bases.
1 water-tight base.	8 wall cases, remodeled.
1 sample wall bracket.	2 storage cases, remodeled.
2 diaphragms.	2 white-pine cases, remodeled.
8 oak settees.	

The appropriation for heating, lighting, and electrical and telephonic service was \$11,000.

Out of this sum there was expended for fuel, \$2,923.87; for heating, supplies, and repairs, \$852.58; for gas, \$811.78; rental of telephones, \$766.69; electric works and supplies, \$748.42; rental of call-boxes, \$120; salary of telephone clerk and telegraph operator, \$1,080; wages of engineer and firemen, \$3,678.12; leaving an unexpended balance of \$18.54.

The methods described at length in report of 1885-'86 for purchasing supplies for the Museum have been followed, and have generally proved satisfactory. It is thought that by means of a few slight changes, which experience has suggested, still greater perfection in business methods may be attained.

Little has been accomplished towards the completion of the back records mentioned in the report of last year, for the entire time of the limited number of employes of the department of Property and Supplies has been taken up with necessary current work.

CORRESPONDENCE AND REPORTS.

The scope of the work of this department, under the charge of Mr. R. I. Geare, executive clerk, has been greatly enlarged during the year, owing to the fact that all letters bearing upon the work of the Museum

are now referred from the Smithsonian Institution to the Assistant Secretary for final action. In previous years a considerable part of the Museum correspondence had been attended to by officers of the Smithsonian Institution.

The Museum correspondence may be grouped under the following headings:

- (1) General Museum business, including matters connected with Museum administration, arrangement of foreign exchanges, etc.
- (2) Replies to requests for information of a technical character.
- (3) Acknowledgment of gifts, loans, and exchanges.
- (4) Reports upon specimens sent for examination and report.

During the year, 1,406 letters were written relating to the general business of the Museum. The reports upon specimens sent for identification numbered 540, and 1,152 acknowledgments of accessions were made, a large number both of reports and of acknowledgments being in letter form. This gives a total of 3,098 official papers prepared for the signature of the Assistant Secretary in charge.

Reports upon specimens sent for examination.—The special researches which have been carried on by the curators during the year have been referred to at some length in the discussion of the work accomplished in the scientific departments. In addition to this a large quantity of laboratory work is necessitated by the receipt of specimens of all kinds which are sent to the Museum for examination and report. The examination of this material, of which a classified list is given below, occupies very much of the curators' time, elaborate reports being in many cases necessary. In each instance a copy of the report, or a letter embodying it, is mailed to the sender. The following table gives the number of requests of this kind received, and arranged by states, the state given being that in which the sender resides and not necessarily that from which the specimen originally came, this fact in many cases not being stated by the sender.

Alabama	10	Louisiana	4
Arizona	9	Maine	3
Arkansas	9	Maryland	5
California	11	Massachusetts	6
Colorado	5	Michigan	6
Connecticut	3	Minnesota	1
Dakota	5	Mississippi	10
Delaware	2	Missouri	3
District of Columbia	14	Montana	4
Florida	13	Nebraska	3
Georgia	5	Nevada	3
Idaho	1	New Jersey	6
Illinois	3	New Mexico	5
Indiana	5	New York	19
Iowa	4	North Carolina	12
Kansas	9	Ohio	16
Kentucky	4	Oregon	3

Pennsylvania	11	Wisconsin.....	4
Rhode Island.....	5	Wyoming.....	1
South Carolina.....	8	Bahamas.....	1
Tennessee.....	25	Canada.....	1
Texas.....	28	Costa Rica.....	1
Utah.....	1	Persia.....	1
Virginia.....	35		
Washington Territory.....	4	Total.....	347

LABELS.

There were received from the Government Printing Office 2,055 forms of labels, classified as follows:

Materia medica	83	Minerals.....	194
Metallurgical.....	14	Reptiles.....	70
Foods, textiles, etc.....	66	Coins.....	106
Mammals.....	471		
Ethnological.....	918	Total.....	2,055
Building-stones.....	133		

Each form contained 24 labels, 12 on board and 12 on paper.

BUILDINGS AND LABOR; POLICE AND PUBLIC COMFORT.

The staff employed for police and inspection under the charge of Henry Horan, superintendent of buildings, consisted of 20 watchmen and doorkeepers; for construction, care of buildings, and repairs, 8 carpenters, 2 painters; for labor and cleaning, 19 laborers, 6 cleaners, 2 attendants; for heating and lighting, 1 engineer and 4 firemen.

From the reports of the superintendent are quoted in brief the following statements, which will serve to show in part the character of the work accomplished by the laboring force during the year:

In July a large amount of mechanical work was done; eight large settees were completed and placed in the rotunda of the Museum building, and diaphragms made for the installation of photographs of fishery appliances, etc. The walls at the north entrance were wainscoted, and screens were placed at the west entrance. A sloping case was made for the department of Fishes for exhibiting relief maps. Sky-lights were placed in the east balcony. Tin trays were placed under the floor ventilators to catch the dust that would otherwise drift through. A number of boxes were received from the New Orleans Exposition, and were turned over to the superintendent for unpacking. Two mahogany pillar cases were completed for the department of Ethnology. The electrical clocks in the buildings were all overhauled and repaired. Screens were made for the different courts.

In August four mahogany pillar cases were completed for the department of Ethnology. Diaphragms were made for cases, and drawers fitted to them. A partition was put up on the north balcony separating the textile and label departments. Excavations were made at the east front and walled up for ventilation of trenches. Work was begun on eight mahogany upright floor cases and on a partition wall on the second floor in northwest pavilion, cutting off the larger portion of the room as a private office for the Assistant Secretary.

In September several large tubs were made for the reception of palm trees. A skylight was placed in one of the rooms on the north balcony. The wall cases were repaired. A large number of pedestals were made for the use of the taxidermist in mounting large animals. Book-cases were made for the Assistant Secretary's office. The large fur-seal case and pedestal of the kangaroo lizard were repaired.

In October a book-case was made for the property clerk's office, and work was continued in reconstructing the wall cases in the south hall of the Museum. Three pedestals were made for petrified logs, and others for use in the departments of Mammals and Comparative Anatomy. All the mahogany upright floor cases were completed. Screens were made to go over pier cases. The roof of the Museum building was painted. Slope cases for the building-stone department were made, and work was begun on a mahogany book-case for the chief clerk's office.

In November a plank walk was laid along the west front of the Museum building. The walls in the northwest court and the ladies' reception-room were painted. A mahogany slope case was completed, and work begun on mahogany upright floor cases. Work was begun on a small brick addition to the building at the east front.

In December partitions were erected in the Annex building for the purpose of making a larger number of rooms.

The collections of Paleozoic Fossils and the office of the curator of that department were removed to the first floor of the southwest pavilion, the curator of mammals removing his office to that vacated by Mr. Walcott. A large book-case in the office of the superintendent was remodeled. Cases for the department of Paleozoic Fossils were reconstructed and storage boxes made for the department of Fishes. The work on the walls of the ladies' room was completed and similar work begun on the gentlemen's lavatory. The taxidermist's outfits were moved from the Annex to the Armory building. Packing boxes were made for the Materia Medica department, and a book-case was repaired for the department of Mineralogy. The last of the lot of mahogany upright floor cases were completed, and work was begun on a mahogany slope case for Gobelin tapestries and carpets. Shelves were arranged in the cases in the anthropological hall.

During the last half of this fiscal year (January to June, inclusive, 1887) the following items relating to the most important work accomplished are given: Partitioning and fitting up room at Armory building; shelving cases in anthropological hall; repairing floors in pottery court; construction of pedestals for large models of pueblos; making bases for seals; construction of screen with sliding door at south entrance; making eight screens over wall cases; repairing eight cases for department of Metallurgy; shelving in wall cases for department of Building-Stones; construction of eight screens over pier case in east hall; three pedestals for Easter Island idols; fitting up cases and screens for the Grant relics.

THE WORK OF THE MUSEUM PREPARATORS.

The preparation of specimens for exhibition in the Museum or for the study series has been continued, and the character of the work of the preparators is indicated in the following statements:

TAXIDERMISTS.

During the present year the work of the department of taxidermy has been unusually extensive. The lack of satisfactory and fairly representative specimens of the American bison in the exhibition series made it imperatively necessary to send the chief taxidermist into the field to collect material for a proper representation of this most conspicuous and important quadruped of North America. During the months of October, November, and December, when the pelage was at its finest, an extremely rich and varied collection was made of fresh skins, skeletons, and skulls of animals of both sexes and all ages, from

the foetal young up to an enormous old bull which measured 5 feet 8 inches in height at the shoulders.*

Upon his return from the field Mr. Hornaday at once proceeded to mount a series of six of the finest skins to form a group, with natural surroundings. In view of the near extermination of the species the specimens are already of almost priceless value, and the group when finished will form a very important and attractive addition to the hall of mammals. The careful life studies made by the chief taxidermist in the field enabled him to produce specimens of unrivaled excellence.

Notwithstanding this very serious interruption to work in the laboratory by work in the field, and still further by a removal of the laboratory from the Annex building to the Armory, and the care of the Montana collection when it arrived, the amount of work accomplished in the laboratory has been very considerable. During the year thirty-one mammals were mounted and placed on exhibition, among which, after the group of buffaloes, the most commanding figure is that of a superb Bengal tigress. A very fine barren-ground caribou, an immense prong-horn antelope buck, and a family of coyotes are also noteworthy additions of the year, while the collection of marsupials is still further enriched by the addition of eleven more species.

During the months of April, May, and June, Mr. Joseph Palmer rendered the chief taxidermist very efficient and valuable assistance in the work of mounting some of the buffaloes, the caribou, antelope, and other mammals. Mr. A. H. Forney has continued to render satisfactory service as assistant taxidermist during the year, and remained at the Museum in charge of the laboratory during the absence of the chief taxidermist in Montana.

List of mammals mounted in the Museum workshops from July 1, 1886, to June 30, 1887.

15381. <i>Felis tigris</i> .	15694. <i>Bos americanus</i> (old bull).
15491. <i>Canis latrans</i> , juv.	15697. <i>Bos americanus</i> (old cow).
15707. <i>Canis latrans</i> .	15685. <i>Bos americanus</i> (young bull).
15708. <i>Canis latrans</i> .	15686. <i>Bos americanus</i> (young cow).
15575. <i>Vulpes fulvus</i> ,	16703. <i>Bos americanus</i> (yearling).
<i>Odobæus obesus</i> (remount).	15503. <i>Bos americanus</i> (young calf).
15478. <i>Sarcophilus ursinus</i> .	15502. <i>Bos americanus</i> (bull head).
15479. <i>Phalangista vulpina</i> .	15503. <i>Bos americanus</i> (bull head).
15477. <i>Thylacinus cynocephalus</i> .	15668. <i>Rangifertarandus grænlændicus</i> .
15311. <i>Bettongia rufescens</i> .	15714. <i>Antilocapra americana</i> .
15303. <i>Halmaturus temporalis</i> .	15634. <i>Cariacus</i> , sp.
13600. <i>Halmaturus bennetti</i> .	15621. <i>Cariacus</i> , sp.
13606. <i>Halmaturus wilcoxi</i> .	15314. <i>Ornithorhynchus paradoxus</i> .
13602. <i>Halmaturus billardieri</i> .	13596. <i>Bettongia grayi</i> .
13598. <i>Halmaturus brachyurus</i> .	

Thirty mammals representing the following orders were skinned and preserved for mounting or for study: Pinnates, 2 specimens; Carnivora,

* See Section III, Paper 5.

19 specimens; Rodentia, 14 specimens; Ungulata, 4 specimens; Marsupialia, 1 specimen.

Three large fishes were cast and skinned for mounting.

One hundred and twenty large mammals were cleaned, retouched, and prepared for casing. Three large mammals were repaired. One large mammal was dismantled. Forty-three large mammal-skins were received (Montana field collection), cleaned, and preserved in bath.

Thirty-nine boxes of specimens were packed for shipment.

Moved furniture, materials, and specimens in the laboratory from the Annex building to new quarters in the Armory building.

Gave instructions in taxidermy to three persons.

*Summary of specimens collected in the field† by Mr. Hornaday and his party.**

EXPLORATION FOR AMERICAN BISON.‡

Bos americanus (Buffalo), 22 skins, 11 skeletons, 44 skulls.

Antilocapra americana (Prong-horn Antelope), 9 skins, 3 heads, 3 skeletons, 3 skulls.

Cariacus macrotis (Black-tail Deer), 5 skins.

Cariacus virginianus (Virginia Deer), 5 skins.

Canis latrans (Coyote), 4 skins, 43 skeletons.

Vulpes velox, 1 skin.

Taxidea americana (Badger), 1 skin.

Lepus callotis (Jack Rabbit), 2 skeletons.

Cynomys ludovicianus (Prairie Dog), 3 skeletons.

Aquila chrysaetus (Golden Eagle), 1 skeleton.

Nyctea scandiaca (Snowy Owl), 2 skins.

Centrocercus urophasianus (Sage Grouse), 22 skeletons.

Pediæcetes phasianellus (Sharp-tailed Grouse), 9 skeletons.

Ampelis garrulus (Bohemian Wax-wing), 3 skeletons.

Branta canadensis (Wild Goose), 2 skeletons.

Pica melanoleuca, var. *hudsonica* (Magpie), 1 skeleton.

Mr. Henry Marshall devoted his time, as usual, to mounting specimens for the department of Birds. During the year he has mounted about three hundred specimens for the exhibition series, and removed from old stands to new ones about five hundred specimens.

OSTEOLOGICAL PREPARATOR.

The following table shows the number of osteological specimens prepared or mounted during the year, as well as the number of animals received in the flesh whose rough preparation§ involved an outlay of considerable time and labor:

* This summary does not include any of the specimens collected during the spring operations in the field, which have been reported upon with the work of the previous year. See Smithsonian Report 1886, Part II. The spring collection, however, should be credited in summing up the total results of the expedition.

† Accession 18617.

‡ During October, November, and December, 1886.

§ Including the poisoning of the numerous specimens destined to be prepared as ligamentary skeletons.

Description.	Mammals.	Birds.	Reptiles.	Batrachians.	Fishes.	Total.
Received in the flesh :						
Entire skeletons.....	17	96	.....	1	2	116
Incomplete skeletons ..	4	3	.....	.....	3	10
Cleaned :						
Entire skeletons.....	40	26	1	3	1	71
Skulls.....	16	.....	.....	.....	1	17
Incomplete skeletons ..	7	.....	.....	.....	.....	7
Mounted :						
Entire skeletons.....	7	12	5	2	1	27
Skulls.....	5	.....	.....	.....	.....	5
Limbs and other pieces.	2	1	.....	.....	.....	3

These tables give a total of 256 specimens on which work was done during the year, and show that, while the entire number is much less than that of the year previous, the number of large pieces handled is very much greater. The necessary work of preparation has indeed interfered seriously with other work, and has increased to such an extent as to render it impossible with the present force to bestow upon it all the attention which could be desired.

The reflooring of the pedestals of the casts of *Megatherium* and *Hadrosaurus* has necessitated repairs, and in addition the series of *Dinocerat* casts, numbering some twenty pieces, has been mounted and placed on exhibition. A number of skeletons have been transferred to new pedestals, leaving but little to be done in that direction.

The mounting of the skeleton of the Asiatic elephant "Albert" has been the most difficult and protracted work of the year. The skeleton forms a very important addition to the exhibition series. The labeling of the osteological collection, which has been done by Mr. Lucas, is in all respects satisfactory.

The transferring of the work-rooms to the Armory building caused a temporary interruption of work during the month of January.

Mr. Walter H. Brown, of the University of Kansas, spent six weeks in this department as a volunteer assistant, for the purpose of studying the methods of preparing and mounting osteological specimens.

MODELERS.

A portion of the time of Mr. Joseph Palmer has been devoted to making casts of fishes and reptiles received from time to time by the Museum, and to repairing casts already on exhibition, which have from handling at various expositions and from other reasons become damaged. Mr. Palmer has rendered much assistance to Mr. Hornaday in connection with the mounting of mammals.

Mr. J. W. Hendley has made casts of Eskimo heads, meteoric stones, various objects for the food collection, stone implements, etc. He also made a model of an Indian woman and several models of Eskimos, for use in the display of costumes.

PHOTOGRAPHER.

Mr. T. W. Smillie, in charge of the photographic work, states that 506 negatives have been added to the permanent files during the year, as follows:

Archæological and ethnological.....	36	Mammals	24
Lithological.....	8	For illustrations of lectures.....	86
Mineralogical	7	Miscellaneous	324
Ornithological	13		—
Metallurgical	7	Total	506

In addition, 117 transparencies have been made, 110 being for use in connection with lectures given in the Museum. Seventy-two geological negatives have been stripped and developed. Three thousand seven hundred and six prints (silver) have been made, as follows:

Archæological and ethnological... 183	Mammals	48	
Lithological..... 49	Miscellaneous	3,268	
Mineralogical	36	—	
Ornithological	28	Total	3,706
Metallurgical	94		

In addition, 506 cyanotypes of case drawings and 45 enlargements have been made. One hundred and fifteen miscellaneous photographs have been mounted. In connection with experimental work for the Institution upon solar and lunar spectrum, 5 negatives and 10 prints were made.

The following persons have been instructed in the methods of photography: Dr. May King (Kiu Yia Me), Mr. C. H. Townsend, Mr. G. P. Merrill, and W. T. Hornaday, of the Museum; Lieutenants Schaefer, Rogers, Bolles, and Werlich, of the U. S. Navy; Mr. Thomas Lee, U. S. Fish Commission, and the photographer of the U. S. Coast Survey. Every facility has been afforded them for acquiring sufficient knowledge of photography to be of practical use to them in the field. (See p. 32 *antea*.)

The usual routine work of numbering and filing negatives has been continued. Several photographic outfits for collectors have been prepared.

By order of the Secretary, a test of seven canceling inks and samples of paper for postal notes was made at the request of the Post-Office Department, and the contracts for the ensuing year were based upon the results of the test.

The large stereopticon has been transferred to the care of this department, and was very successfully employed during the last season of Saturday lectures.

COLORIST.

Mr. A. Zeno Shindler has, in addition to his regular work of coloring casts of fishes, reptiles, etc., for exhibition in the Museum, painted a large collection of similar objects for the American Museum of Natural History, New York, and has made a number of sketches in water color,

among which are views of the Carp pond, a Pima Indian woman engaged in weaving, a Madagascar woman, and a sketch of a Mexican Indian. He also colored photographs of eleven Winnebago, thirty Apache, and twelve Sac and Fox Indians, and also a photograph of an Indian priestess.

Twelve life-size casts of Ute Indians were painted, and a pen-and-ink copy made of a painting of Japanese fishery. Six large casts of grinding stones were painted in oil, and a cast of an ancient plate painted in gold. He also made a chart of the spectrum, and sketches illustrating the mechanism of the voice for the lecture room.

PREPARATOR IN THE DEPARTMENT OF ARTS AND INDUSTRIES.

Mr. E. H. Hawley has devoted the greater portion of his time to the preparation of material for exhibition. Among the more important collections which he has installed during the year were the "Grant relics," and a large number of Japanese and Chinese objects received from Dr. D. B. McCartee, which have all been mounted and placed on exhibition. A considerable number of pictures for the section of Steam Transportation and the department of Lithology, as well as a large collection of photographs from the British Museum, were mounted in folding screens. In addition he has prepared for exhibition many smaller collections and detached objects and prepared manuscript for labels.

ACCESSIONS.

The total number of accessions to the Museum during the year was 1,646.

A table showing the number of accessions to the Museum each year, beginning with 1881, is here given :

Year.	Accession numbers (inclusive).	Accessions.
1881	9890-11000	1, 111
1882	11001-12500	1, 500
1883	12501-13900	1, 400
1884	13901-15550	1, 650
1885 (January to June)	15551-16208	658
1885-'86	16209-17704	1, 496
1886-'87	17705-19350	1, 646
Total since 1881 .....	.....	9, 461

The first entry in the accession book bears the date of January 1, 1859, although considerable material had been received before that time. From these figures it will therefore be seen that the accessions of the past six years and a half nearly equal the total number received during the previous 22 years. An "accession" may include hundreds of specimens.

Mr. S. C. Brown, registrar, has completed an alphabetical index of all accessions to the Museum received up to January, 1887. The manuscript is included in fifteen quarto volumes, and contains 1,394 pages of type-written and printed matter. This is invaluable as a resource for reference.

Of the 1,646 accessions received during this year, no less than 369 consisted of material sent for examination and report. The quantity of this material is rapidly increasing each year, and a classified list may be found in the chapter on laboratory work.

A geographical statement has been prepared, showing the sources of the more important accessions.

GEOGRAPHICAL REVIEW OF THE MORE IMPORTANT ACCESSIONS.

AFRICA.

Comparatively few accessions were received from this continent, and these embraced but few specimens each, in some cases only a single object. The principal collection was that received in exchange from the Bureau of Arts, Paris. This included mammals, insects, ethnological material, and a series of casts of heads of various African tribes. The remaining accessions were the following: Fragments of garnet from Cape Colony; meteoric iron and a "tiger-eye" from Orange River; an ebony club, 2 bone-pointed arrows, a drum or tom-tom and a leather pouch, sent by Mr. Charles Heape, of Manchester, England, in exchange; an ibis (*Bubulcus ibis*) from Egypt. From Lieut. E. H. Taunt, of the U. S. Navy, was received a carved elephant's tusk, garment made of dyed native cloth embroidered, and a specimen of native cloth from the Baluba country, headwaters of Kassai River.

AMERICA.

BRITISH AMERICA.

From Newfoundland were received collections of marine invertebrates and of bird-skins. Col. Cecil Clay, of the Department of Justice, collected and presented moose skins and skulls from Ontario. Skulls of a small quadruped, Richardson's Spermophile, obtained in Manitoba, were received from Mr. E. E. T. Seton. Mr. W. B. Anderson, of Fort Simpson, Northwest Territory, sent a collection of shells. Some fossils from the Chazy formation, Terrebonne, Quebec, and a few Canadian coins were also received.

CENTRAL AMERICA.

A few specimens illustrative of the natural history of Central America were acquired. Among them the following: An iguana from Big Swan Island, from which locality was also obtained a collection of twenty specimens representing five species of land shells, sent by Mr. Charles T. Simpson, and the skull of a Loggerhead turtle (*Thalassochelys caretta*); a

series of the woods of Guatemala, and a collection of the fibers, fabrics, herbs, tallow, crude sulphur, etc., of the country were received from the Guatemalan Government through Enrique Toriello. Mr. Anastasio Alfaro, secretary of the National Museum of Costa Rica, sent three photographs of Costa Rican antiquities and a type of a species of rail, *Porzana alfaro*. Mr. José C. Zeledon sent from Costa Rica skins of *Cotinga ridgwayi*, Zeledon, a new species, and a female of *Carpodectes antoniae*, Zeledon, hitherto undescribed. A peculiar woolen garment worn by Ixtatan Indians of Guatemala, and specimens of the foods used by that tribe, were sent by Prof. Miles Rock.

MEXICO.

Many contributions from this country were received, the most complete being that transmitted by Prof. A. Dugès, of Guanajuato, which embraced bird-skins, shells, fishes, plants, reptiles, insects, mammal skin, and polishing slate. The director of the Mexican Geographical Commission presented a collection of 324 specimens, representing seventy-six species of land, fresh-water, and marine shells. A collection of bird-skins was made at Simora by Lieut. H. C. Benson, U. S. Army. From Hon. John A. Sutter, U. S. consul at Acapulco, were received specimens of cotton, hand-spun yarn, quilt, dye, and shell-fish from which the dye is obtained, from the Indians of Acapulco. Gold and silver ores were sent by Hon. J. T. Morgan, and ores from the Piedras Negras mine were forwarded by the U. S. consul at Piedras Negras. A collection of Mexican pottery, including a clay head, thirty miniature clay heads, two clay toys, six obsidian arrow-heads, etc., was purchased from Rev. Ward Batchelor. A slab of meteoric iron weighing 850 grams, from Toluca, was forwarded by Messrs. Ward & Howell, of Rochester, New York, and a collection of twenty-seven specimens of the marine shells of the Gulf of Mexico, representing twenty species, was received.

SOUTH AMERICA.

Several countries of this continent are represented by small collections or single objects. Among them are the following: Barnacles found attached to a wreck at Payta, Peru, sent by Lieut. W. C. Babcock, U. S. Navy; a crystal from Brazil, sent by Lieut. Commander H. E. Nichols, U. S. Navy; fossil shells from the Pebas group of the valley of the Amazon; six humming-birds, contributed by F. S. Webster; a collection of vegetable fibers from Brazil; a reptile from British Guiana; a South American monkey received from the Zoological Garden of Philadelphia, where it died in captivity; specimens of a grub highly esteemed as food by the natives of Venezuela, found in the heart of palm trees along the Orinoco River. From Santarem, Brazil, were received three bird-skins. Mr. W. E. Curtis, of Chicago, Illinois, sent a small collection of ethnological material from Peru, Ecuador, Bolivia, Chili, Buenos Ayres, and Patagonia, and a specimen of moss from near the Pass of Chicta, Andes.

Mountains, 15,000 feet above sea-level. Mr. C. J. Hering, of Surinam, Dutch Guiana, sent a collection of lepidoptera, reptiles, bird-skins, ethnological objects, etc. In addition to the above were received a few gourd-bowls, a young deer, and a Chilian coin.

UNITED STATES.

Alabama.—A large collection of archæological objects was gathered by Messrs. Henry J. Biddle and I. C. Russell of the U. S. Geological Survey. This collection contained 222 specimens, among which were a human skull and bones, 2 bowls, beads, iron knife-blade, baked clay, 2 stone implements, flint chips, shells, and fragments of pottery, found on the bank of Coosa River, in Cherokee County. A collection consisting of about 350 specimens of shells (*Unio*) from the same locality was sent by Mr. Russell. A collection of 27 species (22 genera) of Clinton fossils and 2 species (2 genera) of Trenton fossils were sent by the U. S. Geological Survey. Three specimens of pottery and 2 minerals were also received.

Alaska.—A number of large and valuable collections were received from Alaska, the principal ones being gathered by officers of the U. S. Navy stationed there. Among these collectors were Lieut. G. M. Stoney, who sent a suit worn by himself while in Alaska, and a collection including ethnological material, and specimens of the different branches of natural history; Lieut. Commander H. E. Nichols, from whom was received a collection of reptiles, crustacea, echinoderms, porpoises and fishes; Capt. C. A. Abbey, U. S. Revenue Marine Steamer *Corwin*, who sent volcanic dust, found on a piece of board at Unga Island; Ensign A. P. Niblack, who sent a specimen each of mink and western porcupine, and also a series of twenty-three photographic negatives of scenes in Alaska; Capt. E. P. Herendeen, who forwarded Eskimo garments from Point Barrow. Other contributors sent valuable material, among whom may be mentioned S. Applegate, who sent a very large collection of ethnological objects, crustacea, insects, fishes, echinoderms, a valuable series of grasses, etc. J. W. Johnson forwarded a collection of bird-skins, plants, ethnological objects, etc., from Nushagak. From W. J. Fisher was received a collection of one hundred and seventy-five ethnological objects, including stone axes, spear-heads, scrapers, snow-knives, pestles, etc. A collection of Alaskan fossils was received from E. E. Howell, and two specimens of almandite in mica schist were sent by Messrs. Ward & Howell, of Rochester, New York.

Arizona.—The principal collections received from this Territory were those of Lieut. Harry C. Benson, U. S. Army, who was stationed at Fort Huachuca. When not engaged in military duties he has collected diligently for the Museum, and has sent many interesting birds' nests and eggs. Several specimens of minerals, insects, birds' nests, silver ore, rocks, and a decoy deer's head, used by the Apache Indians, were also received.

Arkansas.—A few ores and minerals were received from this State, principally those given by the Department of the Interior. A quartz crystal from Crystal Mountain, near Hot Springs, two rock crystals from Ozark Mountains, specimen of pyrolusite from the manganese mining district, and specimens of meteoric iron from Johnson County were contributed. Minerals, rocks, and fish were sent for examination and report.

California.—The collections though small were numerous. Among them may be noted an interesting collection of 98 pearls from California mollusks, sent by Mr. C. R. Orcutt, of San Diego; collections of bird-skins forwarded by Messrs. L. W. Green, L. Belding, John J. Snyder, E. W. Blake, jr., and H. W. Henshaw. F. Stephens sent a rare mammal, the Kangaroo rat (type), (*Dipodomys deserti*). Two blocks of calcite, from Siskiyou County, were given by Prof. J. S. Diller, of the Geological Survey. A mortar from the auriferous gravels on the north side of the American River was presented by H. W. Turner. A very valuable addition was a fossil fish, apparently a fresh-water sculpin, of the genus *Uranidea*, or an allied form of fresh-water Cottoids, found in the tunnel of the Monte Cristo mine on the summit of Spanish Peak, in the auriferous gravel, and sent by John G. Phelps. Chrome ores from Del Norte, Placer, and San Luis Obispo Counties, were presented by the Baltimore Chrome Works.

The State Mining Bureau of California sent shavings of the San Bernardino meteorite, with two photographs of the same object; also, twelve specimens of the mineral Colemanite, from San Bernardino County. Sugar-bearing oak leaves were received from Mr. Livingston Stone.

Colorado.—Of the birds from this State, Mr. Robert Ridgway gave two specimens of Richardson's Merlin, and two other specimens of this species were sent by Dr. Elliott Coues. Col. James Stevenson, of the U. S. Geological Survey, gave seven bird-skins, and C. W. Beckham presented ten specimens, representing six species. Birds' nests were received from H. W. Henshaw, and birds' eggs from A. W. Anthony and Mr. Dennis Gale, of Gold Hill (22 specimens). A few minerals came in, among which were a specimen of astrophyllite in quartz, from El Paso County, and two crystals of almandite in chlorite. A peculiarly colored specimen of the western brook-trout (*Salmo purpuratus*), was also received, through the Fish Commission.

Connecticut.—From Mr. G. Curtis Bishop was received a hawk (*Buteo latissimus*) for examination, and a small collection of birds' eggs was sent by Mr. M. Abbott Frazar in exchange. A specimen of Wall-eyed pike (*Stizostedium vitreum*), from the Connecticut River, was received from Prof. William North Rice, of the Wesleyan University, Middletown, Connecticut, the first of the genus ever found in this region. The Shell-Fish Commission of Connecticut sent 40 specimens of young shad (*Clupea sapidissima*).

Dakota.—Specimens of ore, and rocks stained by decomposition, were sent for examination. From A. T. Sherwood, two crystals of selenite, and from the Etta mine, Rapid City, specimens of tin ore were received.

Delaware.—Only two specimens were received from this State, one of them being a hair-worm, *Gordius* sp., sent by Dr. E. G. Shortlidge, and the other a fish for identification.

District of Columbia.—Among the materials received were a fossil oyster (*Ostrea sellæformis*), sent by John D. Bartlett; a Copper-head snake (*Ancistrodon contortrix*), a Red phalarope, from F. S. Webster; two specimens of lignite from the new reservoir of Washington, a cocoon of *Attacus crecopia* for examination, several Terns (*Sterna forsteri*) given by Thomas Marron, and 19 specimens, 13 species, of birds from H. W. Henshaw.

Florida.—W. H. Ashmead sent 38 specimens of insects. Specimens of Myriapoda were given by C. H. Bollman, also a cocoon of so-called "Electric worm" (*Telea polyphemus*). Several collections of insects (Diptera and Myriapoda) came from E. A. Schwarz. An ornamental gold disk from an Indian mound was sent by S. A. Robinson; an enamel bead, found in a mound, was sent for examination, by Mr. John E. Younglove. Commander L. A. Beardslee, U. S. Navy, presented a collection of fishes from Key West. W. H. Dall made a collection of fishes, mollusks, etc., which he gave to the Museum. Several bird-skins were obtained by exchange with A. P. Chadbourne, and at Key West some bird-skins were obtained by the naturalists on the U. S. Fish Commission steamer *Albatross*. Lieut. J. F. Moser, U. S. Coast Survey steamer *A. D. Bache*, sent a very interesting collection of marine invertebrates from the west coast of Florida. Skeletons and a cranium of a Blackfish (*Globiocephalus*, sp.) came from J. G. Webb, of Sarasota Bay. A young alligator, a Yellow-tailed fish, and six species of marine shells for examination, were also received.

Georgia.—The specimens sent were all for examination and report. Among these were insects, ores, decomposed rock, and stone implements.

Idaho.—The only object received was a specimen of bituminous coal sent for examination by S. D. Edwards.

Illinois.—R. S. Hodge presented some crayfishes, and a bird's nest and eggs were given by W. S. Adams. Plants were sent by H. G. Hodge, a bird by G. F. Morcom, and fresh-water shells by H. A. Pilsbry. Human skulls and bones from mounds and graves in Schuyler and Knox Counties were given by Mrs. Abner Foster.

Indiana.—A large collection of fishes was sent by Prof. O. P. Hay; a drift boulder of quartz-porphry was received from F. M. and C. O. Merica. The Hoosier Stone Company sent a specimen of building-stone. Insects were sent by C. H. Bollman and C. E. Rutherford.

Iowa.—Specimens of shells were received from C. R. Keys and H. E. Pilsbry. Sixteen specimens of quartz geodes containing calcite were

given in exchange by W. T. Hornaday. J. F. Kemmerfield sent an arrow-head and a wedge-shaped Indian stone implement.

Kansas.—A collection of fishes sent by O. P. Hay, and a few birds' eggs and fishes comprised the gifts from this State. Numerous specimens were sent for examination and report; among them sulphides, quartz crystals, insects, magnesian limestone, zinc-blend, and a portion of the mandible of a fossil horse.

Kentucky.—Prof. J. S. Diller, of the U. S. Geological Survey, sent a specimen of peridotite from Elliott County, and C. U. Shepard, jr., a fragment of meteoric iron. A collection of birds was received from L. O. Pindar. From Ward and Howell came slices of meteoric iron in exchange. J. R. Proctor contributed a piece of rope with crystals of chalcedony clinging to it, found in a gas well.

Louisiana.—Among the objects received were land and fresh-water shells, polishing slate, an iron bullet—probably dropped by one of De Soto's soldiers—a stone ax, crystals of lignite, calcite, and selenite, a collection of rocks, a basket made by an Indian, minerals for examination, and miscellaneous specimens.

Maine.—E. C. Greenwood sent several specimens of birds. A collection of minerals came in from the U. S. Geological Survey, and another from N. H. Perry. In addition to these several minerals, a large quartz crystal, two large specimens of diaspore, and a specimen of green mica were given.

Maryland.—The material from this State was almost exclusively ornithological. Messrs. George and Henry Marshall sent a large number of birds, among them being skins of the Red tailed Hawk and the Red-shouldered Hawk, etc. From other contributors were received Albino robins, Ruffed grouse, Crow, Red crossbill, Cooper's hawk, Mourning dove, Whippoorwill, Screech owl, Short-eared owls, etc. O. N. Bryan gave a large collection of archæological objects from Charles County.

Massachusetts.—Minerals from this State were received from Amherst College, the U. S. Geological Survey, from H. H. Macia, who sent crystals of Diaspore, and Dr. O. J. Shepardson, from whom were received specimens of margarite and diaspore with corundophyllite. Seals were collected for the Museum by the U. S. Fish Commission. Isaac M. Jackson sent birds, and a collection of birds' nests was given by H. W. Henshaw. Eight Mandarin ducks and several fishes, etc., were also received.

Michigan.—Specimens of the Whitefish (*Coregonus clupeiformis*), the Lake Carp, and the Loon (*Colymbus torquatus*) were received. C. H. Bollman sent a collection of insects. Larvæ of *Eristalis* and of a small fly came in, and C. A. Whittmore sent some stalactites and stalagmites for examination.

Minnesota.—C. W. Hall sent four specimens of a fossil brachiopod mollusk (*Orthis*, sp.) from the Trenton formation at Minneapolis, and

J. Parker Norris sent three eggs of a gull, *Larus franklinii*. A collection of insects was sent by C. H. Bollman. A fragment of rock, supposed by the sender to be meteoric, came for examination.

Mississippi.—H. C. Medford sent specimens of a plant, *Hibiscus moscheutos* L., for identification. Ferruginous sandstone, quartz, sulphide of lead, iron, and insect larvæ were sent for examination. A. J. Rowland sent a specimen of meteoric zinc. A fossil from the Blue Rock Bluffs, of Metublie Creek, was received from G. V. Young.

Missouri.—Two collections were received from this State in exchange, one consisting of 53 specimens of quartz from F. P. Greaves, and the other of stone ax, arrow-heads, and flint chips, from Dr. A. D. Thomas.

Montana.—A collection of reptiles was sent by L. L. Kennedy. W. T. Hornaday, acting under the auspices of the Institution, made a collection of skins and skeletons of the buffalo and other mammals. The head of an Elk was deposited by Col. J. D. Wilkins. Specimens of fishes from the Gallatin River came from W. C. Harris. A collection of mammals, silver ore, rocks, wood-opal, minerals, reptiles, bird-skins, etc., was made by Mr. George P. Merrill, in Gallatin County, whilst in the field with the U. S. Geological Survey. C. S. Bement sent one cut sapphire.

Nebraska.—W. L. May sent some minnows, said to have fallen from the clouds in a shower. Rocks from lake beds were collected by George P. Merrill. A Kangaroo Gopher was sent by F. N. Sisk.

Nevada.—The specimens received from this State, were silver ore from John Ivey, minerals from L. C. Russell, cobalt and nickel ore, and other ores for examination.

New Hampshire.—A. P. Chadbourne and S. Albert Shaw sent bird-skins. John I. Legro and C. H. Hitchcock sent minerals.

New Jersey.—J. M. C. Eaton gave specimens of the Jumping Mouse. A Trumpet-fish from J. T. Havens, and a Lumpfish (*Cyclopterus lumpus*) from Joseph Reed were received.

New Mexico.—Dr. M. N. Van Fleet sent specimens of Hair-worms (*Gordius*, sp.); Dr. R. W. Shufeldt, U. S. Army, sent specimens of mice, and 250 specimens of a Salamander (*Amblystoma mavortium*); also birds, birds' eggs, and mammals. Dr. H. C. Yarrow gave a Green-tailed towhee (*Pipilo chlorurus*) from Zuñi. A specimen of cerargyrite was received from Dr. F. W. Taylor. By the Bureau of Ethnology a model of the ruin "Peñasco Blanco" was deposited.

New York.—From the American Museum of Natural History were received in exchange 17 mineral specimens. A large series, embracing 1,152 specimens of Taconic fossils, gathered by Mr. C. D. Walcott, was transferred to the Museum by the Geological Survey. In this series are represented 35 species of 23 genera. Mr. Walcott also obtained two slabs of Potsdam Quartz with ripple marks. A collection of archæological objects was given by W. W. Adams. From D. C. Beard was

received a compound nest of the Red-wing blackbird (*Agelaius phœniceus*) and the Marsh wren (*Cistothorus palustris*), both occupied at the same time, and a double nest of the Summer Yellow-bird (*Dendroica æstiva*). G. H. Hudson sent a collection of 31 specimens, 26 species, of butterflies and moths. Among other objects were a Cramp-fish (*Torpedo*, sp.), decomposed tourmaline, larvæ of a Salamander (*Amblystoma*, sp.), apatite, iron ore, and 3 specimens of the Ausable granite.

North Carolina.—A collection of birds' nests and eggs was sent by M. Abbott Frazar in exchange. Minerals, among them a cut sapphire and two specimens of cassiterite, came from Dr. C. W. Dabney, from W. C. Poteat, who also sent some shells, and from T. J. Poyner. A. J. Austin, keeper of Poyner's Hill life-saving station, secured two Black-fish (*Globicephalus*) skeletons. A Bald eagle, several insects, birds' nests and eggs, and Indian stone implements were also contributed.

Ohio.—A collection of archæological objects was sent in exchange by W. C. Cone. H. W. Henshaw gave some birds' nests. A specimen of meteoric iron from a mound near Madisonville was received in exchange from the Peabody Museum, Cambridge, Massachusetts. Oberlin College sent in exchange 28 kinds of corals. A microscopical slide containing what was supposed to be volcanic dust was sent by G. H. Curtis. This material upon examination proved to be the pollen of some plant. W. H. Crane sent ten specimens of an insect, a new species of *Cis*, from Cincinnati, and other insects were received for examination. The cast of a stone pipe found near Piqua, fossils and minerals for examination, a stone implement found in an ancient Indian camp in Hardin County, and four arrow-heads, were also received.

Oregon.—Among the contributors sending material from Oregon was Dr. J. C. Merrill, of the U. S. Army, who has rendered the Museum much valuable assistance in sending from time to time various specimens of natural history. From him this year come, among other things, five shrews, three gophers, two mice, and a chipmunk. A collection of fossils was received from Prof. T. Condon, and a collection of minerals from H. C. Durkee. W. B. Malleis sent skins of grouse and pheasants. The California State Mining Bureau sent ten specimens of priceite. A. W. Anthony sent a nest and five eggs of a Jay (*Perisoreus obscurus*). Specimens of obsidian were also received.

Pennsylvania.—A collection of plants numbering 269 specimens was purchased from Dr. J. F. Brunner. The Baltimore Chrome Works sent specimens of chrome ore. Robert Hare Powel's Sons gave a large collection of ores, minerals, etc., which had been exhibited in New Orleans in 1884. "Lead buckles" were sent by Harrison Bros. & Co., and a specimen of cassinite by Dr. Isaac Lea. Mr. Willard Nye, jr., gave three specimens of Pileated woodpecker (*Hylotomus pileatus*).

Rhode Island.—D. T. Church sent specimens of fishes.

South Carolina.—William Brewster sent a bird's nest and five eggs. A Barn-owl was given by Major T. B. Ferguson. A carved powder-horn,

a relic of the French and Indian wars, was donated by Master C. McMichael Barton. A tortoise, an Indian ceremonial weapon, and a species of frog were given by Mr. Frank Burns, of the U. S. Geological Survey, who also sent mollusks. Mr. George H. Ingraham sent specimens of clay mixed with sand, thrown up out of the earth in Charleston during the earthquake.

Tennessee.—Dr. J. C. McCormick, of Strawberry Plains, sent several collections of human bones, teeth, fragments of flint, pottery, shells, etc. Four shells were received from Miss A. E. Law, and examples of meteoric iron from Prof. Ira Sayles. A carved stone pipe and small copper ax were lent for examination by J. B. Nicklin. A specimen of meteoric iron was received in exchange from Ward and Howell. A number of objects were received for examination, among them a Rhinoceros beetle, manganese ore, lithographic limestone, quartz, limonite, pyrite, pig-iron, etc.

Texas.—Among contributors sending ornithological material from this State were William Lloyd, who sent 40 specimens of birds, representing 22 species; L. C. Leith, who contributed 3 specimens of the Roseate spoon-bills (*Platalea ajaja*); and M. Abbott Frazar, from whom came 13 birds' eggs. Land and fresh-water shells were sent by H. A. Pilsbry, W. W. Westgate, Robert T. Hill, and Samuel Hammon-tree, who also sent the lower valve of an extinct species of the Rudistæ (*Radiolites austinensis*). A Virginia deer (*Cariacus virginianus*), plants, and minerals were sent for examination. A small collection of garnets was purchased from S. G. Maxwell. The hind feet of an ass, showing abnormal development, together with a photograph of the same, were sent by J. C. Baldwin. Dr. R. W. Noble gave a fossil fish-head, found embedded in blue slate rock 20 feet below the surface. Several species of fish were given by R. A. Golden, a fish-dealer of Washington.

Utah.—Only two contributions were received. Dr. F. W. Taylor sent specimens of silver from the Storm King mine, and Dr. A. S. Packard, of Brown University, gave a specimen of a peculiar snail (*Helix subrupicola*) from Clinton.

Vermont.—A beetle (*Adalia bipuncta*) was sent by Rev. J. W. Guernsey, and Prof. Henry M. Seely sent 31 specimens of *Nothozoa vermontana* and several specimens of *Olenellus*.

Virginia.—Collections of birds and nests were made by Robert Ridgway. A Great Horned owl, buzzard, Red tailed hawk, Red tailed woodpecker, and several other birds were given. Prof. I. H. Morrison sent limonite crystals, pseudomorph after pyrite, and polished dufrenite; also, a slab of dendrites from the Lower Silurian formation. Two specimens of marble from Loudoun County, one cut moonstone, iron and manganese ore, limonite, iron pyrites, copper ore, black quartz, quartz with particles of mica, iron pyrites in quartz, meteoric iron, hematite containing a small amount of titanium were received, most

of the specimens being sent for examination. From Mount Vernon were received several specimens of the Sand adder (*Heterodus*) and a "nest" of a hornet (*Vespa maculata*), containing a large number of insects, given by Mr. J. H. Kuehling. A few insects, among the number the larvæ of *Citheronia regalis*, were received. S. B. Hoopman sent a model of a "stone chair" found in a mountain near Hillsborough. Several small collections of Indian beads, pottery, and a rude chipping tool were received. J. McNamara sent a camphene chandelier, illustrating a method of house illumination prior to the use of gas. Several specimens of fishes and an Albino deer were also received.

Washington Territory.—Dr. W. E. Everett sent a Wood rat and birds' nests. A collection of ethnological objects was received from Charles Willoughby, U. S. Indian agent at Quinaielt.

West Virginia.—G. F. Kunz, of New York, sent eleven fragments of meteoric iron from Jenny's Creek. A "water bug" (*Belostoma americana*) was sent for examination. Dr. J. R. Mathers sent a Rattlesnake. A collection of 14 species, 13 genera, of Carboniferous fossils came from August D. Selby.

Wisconsin.—Capt. B. F. Goss sent a nest and eight eggs of a Wren (*Regulus satrapa*). C. H. Slayton sent a species of tape-worm taken from the white of an egg, and Andrew Oleson sent specimens of quartz and mica, both for examination.

Wyoming.—Col. James Stevenson, of the Bureau of Ethnology, sent eight garnet pebbles and garnet in quartz.

WEST INDIES.

The principal collection from these Islands was received from the Wesleyan University, of Middletown, Connecticut, and consisted of 484 specimens of sponges and 246 specimens of coral gathered in the Bermudas by Dr. G. Brown Goode, in 1876-1879, for the university, and now transferred to the National Museum in exchange. Prof. Alexander Agassiz, of Cambridge, Massachusetts, sent a collection of about 500 specimens of mollusks and brachiopods (representing 205 species), obtained by the Coast Survey steamer *Blake* in the West Indies and Gulf of Mexico, in the years 1876, 1877, and 1878. Mr. John Gundlach, of Termina, Cuba, sent 3 species of birds, one of which, a hawk (*Accipiter fringilloides*), was new to the collection. General D. E. Coombs, of Baracoa, Cuba, sent 2 specimens of Chromium ore. Eight specimens of Audubon's Shearwater (*Puffinus auduboni*) were received from C. J. Maynard & Co., and Mr. Charles B. Cory sent a collection of bird-skins.

ASIA.

Dr. D. Bethune McCartee made several additions to his already large Japanese and Chinese collections now in the Museum. Among the specimens received were mussel-shells with images of Buddha painted on the inside, a geomantic compass, a spoon made from the pearly

nautilus-shell, such as is used by Buddhist priests in Siam for eating rice. He also deposited a Japanese stiletto.

Ethnological objects from Persia, India, and Japan were received from Mr. Charles Heape in exchange.

Dr. N. McP. Ferebee, of the U. S. S. *Trenton*, sent a collection of fishes, marine invertebrates, reptiles, etc., from China, Japan, and Corea.

Three trunks made of pig-skin, and two fragments of the "Great Wall," were received from China.

The Bureau of Education at Tokio, Japan, sent a large collection of ethnological objects, fishes, and minerals, and a valuable series of 104 bird-skins. Prof. R. Collett and Mr. Kneeland also made interesting contributions from Japan. P. L. Jouy presented some valuable objects from Japan and Corea. Dr. L. Stejneger contributed a collection of bird-skins, 40 specimens (17 species), from Kamschatka. This collection was an especially valuable addition, containing several species new to the Museum collection. He also contributed bird-skins from Japan.

From India specimens of meteoric iron were given by Ward & Howell, and a bird-skin by H. K. Coale. Mrs. Helen Tompkins sent from Lahore two tea-pots made of Cashmere lacquer.

AUSTRALIA.

Joseph S. Spinney forwarded some seed of the "Blue Bush" and "Salt Bush," collected by H. C. Mais.

A "Great kingfisher" (*Dacelo gigas*) was received from the Zoological Society of Philadelphia.

OCEANICA.

A collection of ethnological objects from Oceanica was received from the Musée de Trocadero in exchange.

Several Tasmanian mammals were received from the Ballarat Fish Acclimatization Society.

From Mr. Charles Heape, of Manchester, England, were received, in exchange, ethnological objects from New Guinea, Solomon Island, and New Hebrides.

Ethnological objects from New Britain, Savage Island, Admiralty Island, Tonga, New Ireland, Fiji Islands, and Navigator's Islands were received.

Valdemar Knudsen sent bird-skins from the Hawaiian Islands, whence also were obtained a bat, presented by C. N. Spencer, and a collection of mammals and 37 bird-skins. Most of the latter are new to the collection, while no less than 5 are new to science.

The U. S. S. *Mohican* was sent by the Secretary of the Navy to Easter Island, where a most interesting collection of archaeological objects was obtained.

The Auckland Museum, in Auckland, New Zealand, sent a large collection of bird-skins, including 104 specimens.

A Fijian war club was received from Dr. Browsers, and a collection of bird-skins was given in exchange by Oberlin College, Ohio.

EUROPE.

Mr. Thomas Wilson deposited a large archæological collection which he had gathered while residing in Nice, France, as United States consul. This includes specimens from Italy, France, England, Switzerland, and Sardinia.

B. Sturtz sent in exchange a collection of minerals from Germany, Switzerland, Norway, Sweden, and Austria. Minerals were also received from Germany, France, Italy, Norway, and Switzerland. F. W. True gave a collection of coins from Germany, France, and Switzerland.

A collection of shells from Northern Europe was sent by Rev. A. M. Norman, and 5 specimens (4 species) of European birds were given by Dr. L. Stejneger.

From France 4 specimens of cuprite altering to malachite were received from S. C. H. Bailey in exchange. Specimens of diptera were received.

A fossil cephalopod from Germany was sent by Prof. C. Schluter, of Bonn am Rhein.

From Italy was received a specimen of meteoric iron.

H. C. Hallowell sent in exchange minerals from Norway.

A spheroid of granite from Tonne, Sardinia, was sent by B. Sturtz.

From the Academy of Science at St. Petersburg, Russia, were received two specimens of a new Cyprinoid fish (*Phoxinus stagnalis*, sp. nov.).

A collection of rocks and minerals from Sweden was purchased for 200 francs from L. J. Igelström.

A collection of Irish archæological objects was sent by Mr. James F. Johnson, of Holywood.

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

The courteous assistance rendered by the Departments of the Government has as usual been the means of adding much valuable material to the national collections, and has renewed the obligations of the Museum.

DEPARTMENT OF STATE.

Hon. S. S. Cox, United States minister to Turkey, sent a Turkish caique with oars and dresser from Constantinople, which unfortunately was destroyed by the carelessness of the transportation agents.

General A. C. Jones, United States consul at Chin Kiang, China, sent a brick from the "Great Wall."

John A. Sutter, United States consul at Acapulco, Mexico, contrib-

uted cotton, hand-spun yarn, quilt, purple dye, and shell from which the dye is made, used by Indians of Acapulco.

Jacob Schoenhof, United States consul at Tunstall, England, transmitted a case of scoured wools.

Charles P. Williams, United States consul at Rouen, France, forwarded specimens of flax, and consular report 67, containing a statement concerning the same; also specimens of ramie fiber in different stages of manufacture.

V. O. King, United States consul-general, Bogota, sent a collection illustrative of the natural history of the United States of Colombia.

TREASURY DEPARTMENT.

In 1840 the Imaum of Muscat presented to the United States Government a collection of 106 diamond brilliants, 27 diamond "chips," 148 perforated pearls, 2 large pear-shaped pearls, gold plate, inside lining of snuff-box, gold ornament, 2 lumps of gold, and bottle of "attar of roses." This collection has since the time of its presentation been kept in a vault at the United States Treasury, and was this year transferred to the custody of the Museum.

Life-Saving Service.—A. J. Austin, keeper Poyner's Hill life-saving station, North Carolina, sent two skeletons of a Blackfish (*Globicephalus melas*), and Joseph Reed, keeper life-saving station at Tom's River, New Jersey, sent a Lumpfish (*Cyclopterus lumpus*).

Light-House Board.—Herbert M. Knowles, keeper of light-house, Point Judith, Rhode Island, sent fishes in alcohol.

U. S. Revenue Marine.—A specimen of the rare Banded-seal (*Histriophoca equidens*) was presented by Capt. M. A. Healy, U. S. R. M. S. *Bear*. volcanic dust from Nuga Island was transmitted by Capt. C. A. Abbey, U. S. R. M. S. *Corwin*.

WAR DEPARTMENT.

Col. John D. Wilkins, U. S. Army, Fort Keogh, Montana, sent the head of a Deer (*Cervus canadensis*).

Maj. W. S. Beebe, U. S. Army, Brooklyn, New York, sent a cast of a carved stone of green serpentine.

Capt. H. Catley, U. S. Army, sent a Blue Spotted sunfish.

Capt. B. F. Goss, U. S. Army, contributed nest and eight eggs of *Regulus satrapa*.

Dr. J. C. Merrill, U. S. Army, sent several collections of mammal-skins and a collection of insects.

Dr. James Reagles, U. S. Army, sent a decoy (deer's head) used by an Apache Indian, found in a cave on the east fork of the Verde River.

Dr. R. W. Shufeldt, U. S. Army, sent 250 specimens of *Amblystoma*, 3 specimens of a striped snake (*Eutania vagrans*), also several bird-skins and birds' eggs.

Capt. Henry Romeyn, U. S. Army, Fort Keogh, Montana, sent speci-

mens of a turbot (*Lota maculosa*) and of the blistering beetles (*Epicauta maculata*).

Lieut. H. C. Benson, U. S. Army, Fort Huachuca, Arizona, sent several collections of birds' eggs and bird-skins.

Dr. H. C. Yarrow, U. S. Army, sent samples of food used by the Indians of Venezuela, and reptiles from the Island of Trinidad.

Charles Ruby, U. S. Navy, sent some natural concretions, some fossils, and a Civet cat.

Sergt. S. Applegate, U. S. Signal Corps, sent from Unalaska, Alaska, a large collection of ethnological objects, crustacea, insects, and grasses.

Acknowledgment is here made for the continued service of Dr. H. C. Yarrow and Capt. C. E. Bendire as honorary curators, the former of the Department of Reptiles and the latter of the Department of Birds Eggs.

NAVY DEPARTMENT.

The Secretary of the Navy rendered a most important service to the National Museum and to science by detailing the U. S. S. *Mohican*, Commander Benjamin F. Day, to obtain a collection of stone images and archæological objects from Easter Island.

Lieut. Seth M. Ackley, U. S. Navy, sent a fragment from the "Great Wall" of China.

Lieut. W. C. Babcock, U. S. Navy, sent barnacles found attached to a wreck at Payta, Peru, and a fish.

Lieut. L. A. Beardslee sends a specimen of fungus.

A collection of silver and copper coins were given by Lieut. T. Dix Bolles.

Surgeon N. McP. Ferebee, U. S. S. *Trenton*, sent a large collection of fishes, marine invertebrates, reptiles, and insects from Japan, China, and Corea.

Capt. E. P. Henderson sent a collection of Eskimo clothing from Point Barrow, Alaska.

Lieut. J. F. Moser, U. S. Navy, of the Coast Survey steamer *A. D. Bache*, sent two collections of marine invertebrates from the west coast of Florida.

Lieut. H. E. Nichols, commanding U. S. S. *Pinta*, sent a collection of reptiles, crustacea, worms, echinoderms, and fishes.

Lieut. R. E. Peary, U. S. Navy, gave a collection of shells, minerals, volcanic rock, fish, mineral dust, etc.

Lieut. George M. Stoney, U. S. Navy, sent a large collection of nests, ethnological objects, mammals, insects, plants, bird-skins, birds' eggs, and a suit worn by the donor while in Alaska.

Lieut. E. H. Taunt, U. S. Navy, sent a collection of knives, spears, shields, etc.; native cloth, embroidered and dyed, from Central Africa.

Paymaster E. B. Webster, U. S. Navy, sent a Chilkaht drum, Tinné Indian snow-shoes, and a fishing catamaran, full rigged, from Pernambuco, Brazil.

Ensign A. P. Niblack, U. S. Navy, sent from Alaska the skin of a

Western porcupine, and 23 photographic negatives taken in Alaska and elsewhere.

Ensign W. E. Safford, U. S. Navy, U. S. S. *Mohican*, sent 5 bird-skins from the Isthmus of Panama; bird-skins, birds' nests and eggs, archaeological and ethnological objects, marine shells, fresh-water and land shells, marine invertebrates, reptiles, etc., from various localities.

Dr. H. G. Beyer, U. S. Navy; has continued to act as honorary curator of the section of *Materia Medica*. Lieut. T. Dix Bolles, Paymaster E. B. Webster, and Dr. F. S. Nash have rendered valuable services in connection with the Department of Ethnology in the Museum.

POST-OFFICE DEPARTMENT.

A collection of United States postage-stamps, newspaper wrappers, stamped envelopes, and newspaper stamps, 170 specimens in all, was received from the Postmaster-General.

DEPARTMENT OF THE INTERIOR.

A collection of minerals from Arkansas and specimens of petrified wood from the Yellowstone National Park were received. From the Office of Indian Affairs was sent a set of bows and arrows. Charles Willoughby, United States Indian agent at Quinaielt, Washington Territory, sent a collection of ethnological objects.

U. S. GEOLOGICAL SURVEY.

As in previous years, a large amount of valuable material, including not less than 5,000 specimens, has been received from the U. S. Geological Survey, transferred by Major J. W. Powell, Director of the Survey. Among the collections received from this source were the following: Clinton fossils, 22 genera, 27 specimens, from Etowah and DeKalb Counties, Alabama; also, Trenton fossils, 2 species; Potsdam quartzite, with peculiar markings; Ausable granite, 3 specimens; Taconic fossils, 23 genera, 35 species, 1,152 specimens, collected by C. D. Walcott; Pogonip fossils, 31 genera, 68 species, 1,202 specimens, collected by Mr. Walcott; Trenton fossils, 19 genera, 26 species, from Nevada; a collection of fossils, rocks, sponges, etc., from Florida; Clinton and Oriskany fossils, 6 species; fossil bones from Mississippi and fossil wood from California and South Carolina; a mortar from the auriferous gravels at the north side of the American River at Folsom, California; gold in quartz, from Sky High mine, Plumas County, California; rocks, ores, etc., collected in Texas and Louisiana by L. C. Johnson; two slabs of marble from Loudoun County, Virginia; fragments of upper and lower molar teeth of a fossil horse, and fragments of mastodon molars, collection of fossil fishes, mammals, silver, ores, rocks, wood, opal, and minerals, collected in Gallatin County, Montana, by George P. Merrill, while in the field with the Geological Survey; collection of minerals from Arkansas and Yellowstone Park, and ferruginous concretions from Maryland.

Very valuable services have been rendered by the following gentlemen, who are acting as honorary curators in the Museum: Mr. W. H. Dall, Department of Mollusks; Mr. C. D. Walcott and Dr. C. A. White, Departments of Paleozoic and Mesozoic Invertebrate Fossils; Prof. Lester F. Ward, Departments of Fossil and Recent Plants, and Prof. F. W. Clarke, Department of Minerals.

DEPARTMENT OF JUSTICE.

Col. Cecil Clay, chief clerk of this Department, sent skins and a skull of a moose (*Alces machlis*) and photographs of cow-moose.

DEPARTMENT OF AGRICULTURE.

Dr. A. K. Fisher, of the Bureau of Economic Ornithology, sent Sparrow-hawk, Red-tailed hawks, Red-shouldered hawks, Red-breasted merganser, and birds' nests and eggs. The Museum still enjoys the cooperation of Prof. C. V. Riley, the entomologist of the Department, as honorary curator of insects.

U. S. FISH COMMISSION.

Several collections of marine invertebrates, fishes, birds, shells, reptiles, etc., have been received; also birds' nests and eggs, skulls of sail-fish, birds, lice from seals, 3 worm-eaten planks taken from schooner *Melissa D. Robbins*, shark, fish, seals, fungi, etc. From Major T. B. Ferguson was received a specimen of Barn-owl, and from C. H. Townsend 15 specimens of *Menopoma* and eggs. Mr. Townsend made an exploration of Swan and Grand Cayman Islands, and has already forwarded a collection of birds, concerning which Mr. Ridgway, curator of birds, makes the following statement:

Swan Island.—The collection from this place embraces 31 species, of which 22 are land birds. Of the latter 17 are migrants from Eastern North America; *Coccyzus seniculus* is West Indian and Central American; *Columba leucocephala* belongs to the coast of Honduras and some of the Greater Antilles; *Mimocichla rubripes* (of which a good series was collected) is identical with the Cuban species, instead of being that found on Grand Cayman (*M. ravida* Cory); *Contopus albicollis* Lawr? (2 specimens) is probably identical with a Yucatan species, and *Dendroica vitellina* Cory, is identical with a species found elsewhere only on Grand Cayman. The only new form is a *Butorides*, allied to *B. virescens*, but altogether darker in coloration, and perhaps different enough to be considered specifically distinct.

The water-birds include five specimens of the following: *Tringa maculata*, *Ereunetes pusillus*, *Totanus flavipes*, *Porzana carolina*, *Sula cyanops*, *S. piscator*, *S. sula*, and *Fregetta aquila*.

Grand Cayman.—Mr. Townsend's collection from this island contains 12 species, including 5 of the 13 new species obtained by Mr. Cory's collector, viz: *Certhiola sharpei*, *Dendroica vitellina*, *Centurus cayman-*

ensis (good series), *Quiscalus caymanensis*, *Myiarchus denigratus*, and *Vireo caymanensis*. Mr. Townsend also collected a good series of the *Dendroica* which Mr. Cory identified (from a very poor specimen) as *D. petechis gundlachi*, which proves to be a very strongly characterized new race, not specially near to anything else.

Notwithstanding the very limited time spent on Grand Cayman Mr. Townsend did remarkably well, and the specimens secured by him are in fine plumage and beautifully prepared.

Although the results attained on Swan Island are disappointing, they show clearly that that island is, geologically, of very recent formation, and none of the birds (except the *Butorides*, which is a peculiarly "plastic" type) have yet had time to become differentiated into local forms. Additional collections are expected and will be referred to in the next report.

BUREAU OF ETHNOLOGY.

A series of 30 photographs of Apache Indians—10 of the Sacs and Foxes, and 39 of Winnebagoes, Utes, and Osages—was received. Models of the pueblos Bonito and Shemopavi, and ruin of Peñasco Blanco were also transferred. These numbered about 400 specimens in all. Dr. Washington Matthews sent a woolen blanket worn by a Navajo Indian. Prof. H. W. Henshaw sent birds' nests, eggs, and skeleton.

Mr. W. H. Holmes, of the Bureau, has continued to act as honorary curator of the Department of American Aboriginal Pottery.

EXPLORATIONS.

It is deemed appropriate to mention in this report certain explorations which have been made during the year, and which have redounded to the advantage of the Museum.

An expedition under the direction of Mr. William T. Hornaday was sent to Montana in May, 1886, in search of buffalo. The object of this undertaking was to secure a sufficient number of specimens for exhibition and for exchange with other museums. A subsequent expedition was sent out in the fall of the same year. The results have been highly gratifying. Special mention is made in this connection of the valued co-operation rendered to the Institution in this enterprise by the War Department, the Northern Pacific Railroad, and the Chicago, Milwaukee and St. Paul Railroad.

In addition to the collection of mammal skins and skeletons obtained by Mr. Hornaday on his first expedition, was a small collection of bird skeletons and skins.

The following is a complete list of the specimens obtained :

- Antelope, *Antilocapra americana*, 2 skins and 3 skeletons.
- Prairie Hare, *Lepus campestris*, skin and skeleton.
- Wood Hare, *Lepus sylvaticus*, 2 skins.
- Pale Chipmunk, *Tamias asiaticus pallidus*, skin.
- Coyote, *Canis latrans*, skin.
- Buffalo, *Bison americanus*, 3 skins, 7 skulls, and 5 skeletons.

Eastern Striped Spermophile, *Spermophilus tridecim-lineatus* (skin.)
 White-footed Mouse, *Hesperomys leucopus*, skin.
 Muskrat, *Fiber zibethicus*, 3 skins.
 Sage Cock, *Centrocercus urophasianus*, 2 skeletons.
 Marsh Harrier, *Circus hudsonius*, skeleton.
 Blue-winged Teal, *Querquedula discors*, skeleton.
 Shoveller Duck, *Spatula clypeata*, skeleton.
 Blue-headed Grackle, *Scolecophagus cyanocephalus*, skeleton.
 Cliff Swallow, *Petrochelidon lunifrons*, 2 skeletons.
 Red Thrasher, *Harporhynchus rufus*, 2 skeletons.
 Lark Bunting, *Calamospiza melanocorys*, 3 skeletons.
 Shore Lark, *Eremophila alpestris*, skeleton.
 Lark Finch, *Chondestes grammacus*, skeleton.
 Western Mourning Dove, *Zenaidura macroura*, skeleton.
 Mountain Plover, *Egialitis montana*, skeleton.

As the result of the second expedition quite a large collection of skins, skeletons, and skulls of buffalo, deer, antelopes, wolves, and smaller animals was received.* The collection included the following species: *Bison americanus*, *Canis latrans*, *Antilocapra americana*, *Cariacus macrotis*, *C. virginianus*, *Vulpes velox*, and *Taxidea americana*.

One of the buffaloes, an old bull, the most conspicuous of the group now being mounted by Mr. Hornaday for exhibition in the Museum, has attracted considerable attention. This specimen was examined by several gentlemen who from familiarity with the animal in its native condition were competent to express an opinion as to the accuracy of the taxidermist's work. Among the gentlemen who examined it were General Stewart Van Vliet, of the U. S. Army, and Col. James Stevenson, of the Bureau of Ethnology. Both of these gentlemen expressed their opinion in writing, and copies of their letters are herewith given:

WASHINGTON, D. C., March 10, 1887.

MY DEAR PROFESSOR BAIRD: On the receipt of your letter of the 6th instant I saw General Sheridan, and yesterday we called on your taxidermist and examined the buffalo bull he is setting up for the Museum. I don't think I have ever seen a more splendid specimen in my life. General Sheridan and I have seen millions of the buffalo on the plains in former times. I have killed hundreds, but I never killed a larger specimen than the one in the possession of your taxidermist.

General Sheridan thought the animal was too tall, but the taxidermist showed us, in his note-book, the measurements he made of the animal when he shot him, and they agreed with the stuffed animal. I thought that the left hind leg might be brought forward 6 inches. This would make the animal look a little shorter, but I doubt if I would do even this. It is a magnificent specimen as it is, and perfectly natural. You will have this consolation, anyhow, even if the animal is exaggerated—which he is not—and that is, not one in ten thousand who looks at him ever has or ever will see a live buffalo.

Yours, sincerely,

STEWART VAN VLIET,
 Brevet Major-General U. S. Army.

Prof. SPENCER F. BAIRD,
 Smithsonian Institution, Washington.

* Accession 18617.

SMITHSONIAN INSTITUTION, BUREAU OF ETHNOLOGY,
Washington, D. C., April 14, 1887.

DEAR SIR: After having made two visits especially to examine the buffalo bull which you recently secured from the West, and the mounting of which you have just about completed, I beg to freely express my opinion in regard to the same; that is, as to the general correctness of the attitude, shape, and appearance of the specimen. At first sight I would say that it appears too full about the rump; in the next place the specimen appeared somewhat lengthy, and the vertebral ridge does not seem quite prominent or sharp enough, especially to the rear of the loins. I think, however, as to the criticism first expressed, after a closer examination of the robe or coat, it is quite evident that the animal was in an unusually fleshy condition, as the coating of hair is the finest and heaviest I ever saw on a bull, either young or old, and this quite satisfactorily accounts for the fullness of the rump and the hind quarters. As to the second question, that is the length, I find upon examination of over two hundred measurements of buffalo bulls made by myself both before and subsequent to the war, when buffalo were counted by the millions, and the best specimens were available, that your specimen is as nearly correct in every respect as it is possible to make it. I find also upon examination that the profusion of wool along the back fully accounts for the apparent defect in the prominence of the backbone.

On general principles I would say from an extensive personal experience in skinning buffalo and preparing and mounting specimens during a period of many years, when the entire northern and western parts of our country were roamed over by vast herds of buffalo, that you have been most fortunate in securing one of the finest, if not the finest, specimen I ever saw, almost perfect in every respect, and in my opinion beyond criticism in the completeness of mounting, anatomical appearance, and naturalness of attitude.

I do not think that any one could safely venture to criticise any feature of the specimen referred to who has not killed, measured, and mounted specimens themselves.

Very respectfully, etc.,

JAMES STEVENSON.

WILLIAM T. HORNADAY, Esq.,
Taxidermist, U. S. National Museum.

A full account of these expeditions is given in a special paper prepared by Mr. Hornaday and published in Section III of this report.

Mr. C. G. Pringle, an accomplished botanist, went to northern Mexico under the auspices of Harvard University and the Smithsonian Institution for the purpose of securing botanical and general natural history collections.

Dr. T. H. Bean, on a cruise in the U. S. Fish Commission steamer *Albatross*, investigated the movements of the "southern mackerel."

A party sent out by the U. S. Geological Survey to make explorations in the Upper Mississippi Valley was accompanied by Dr. R. R. Gurley, of the Museum, who went for the purpose of securing additional material for the collection of Cambrian fossils in the Museum. This party left in June, and nothing has yet been heard as to the results of Dr. Gurley's work.

Through the courtesy of the Secretary of the Navy a valuable collection of stone objects was obtained from Easter Island. A full account of this collection is given on pages 15-16.