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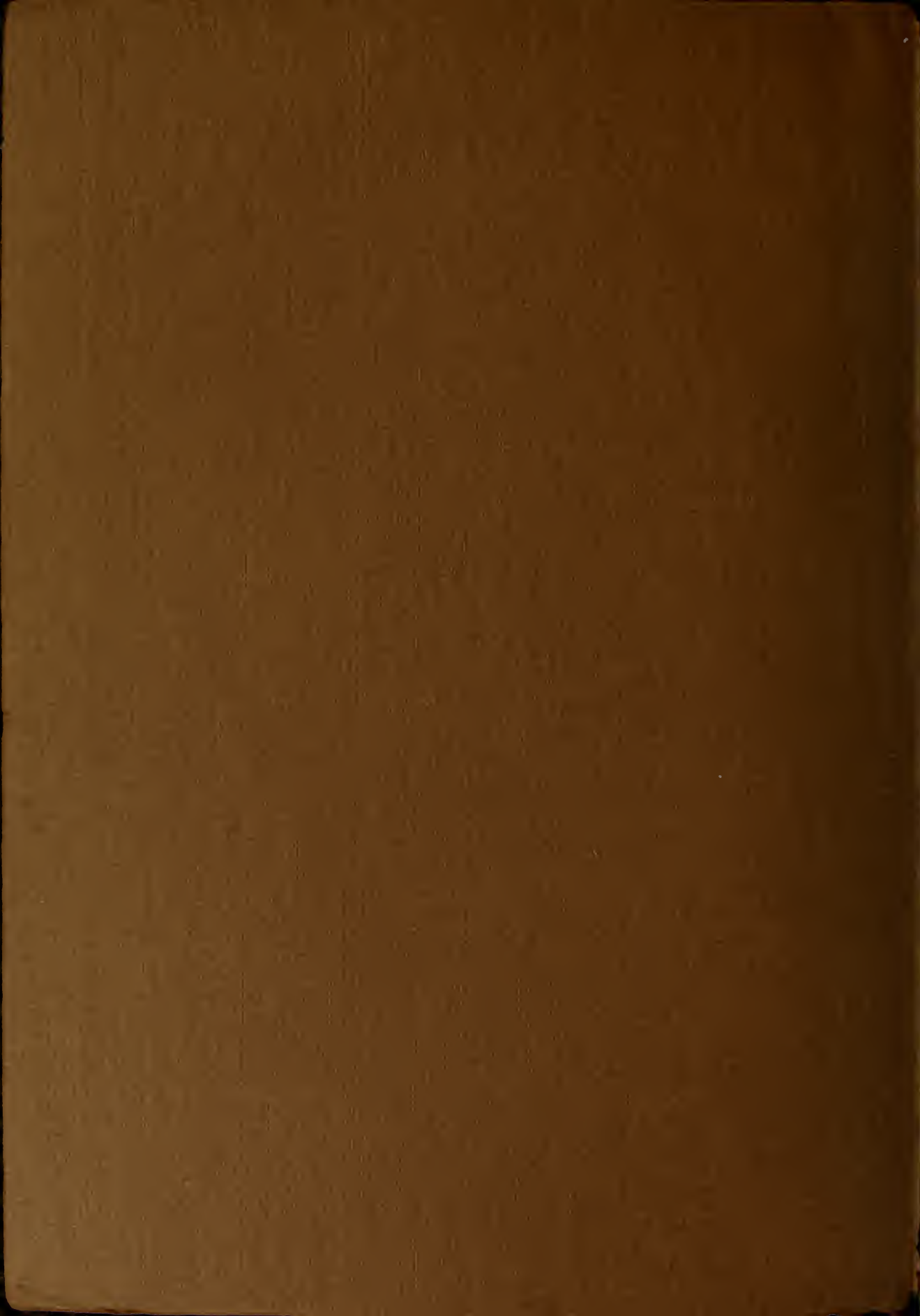
AMERICAN MUSEUM
OF
NATURAL HISTORY

GENERAL GUIDE
TO THE
EXHIBITION HALLS



LIBRARY
OF THE
AMERICAN MUSEUM
OF NATURAL HISTORY

Guide Leaflet Series, No. 40
New York, November, 1914
Published by the Museum



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Seventy-seventh Street and Central Park West, New York City

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THE AMERICAN MUSEUM OF NATURAL HISTORY was established in 1869 to promote the Natural Sciences and to diffuse a general knowledge of them among the people, and it is in cordial coöperation with all similar institutions throughout the world. The Museum authorities are dependent upon private subscriptions and the dues from members for procuring needed additions to the collections and for carrying on explorations in America and other parts of the world. The membership fees are,

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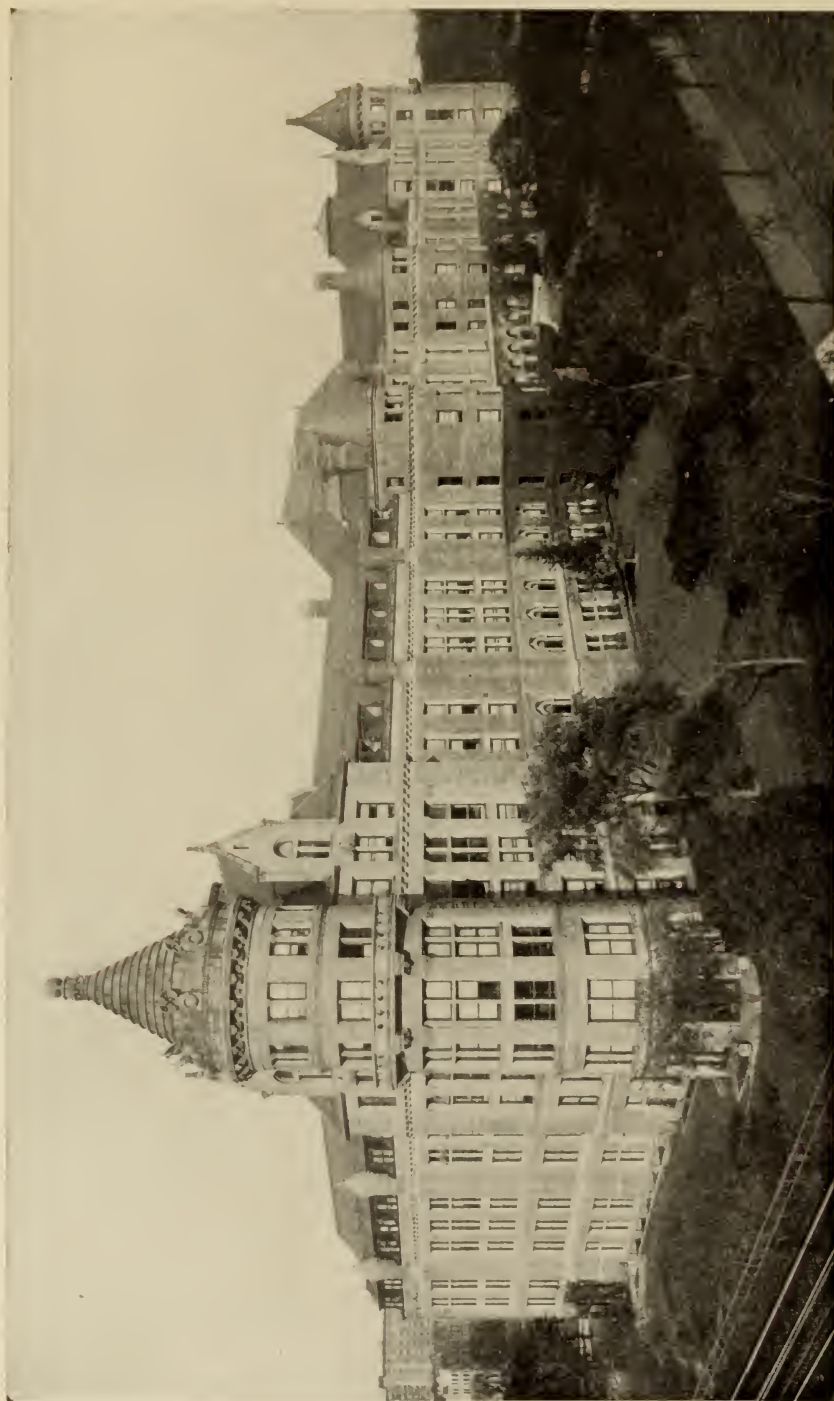
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THE AMERICAN MUSEUM OF NATURAL HISTORY OF WHICH THE CORNER STONE WAS LAID IN 1874 BY PRESIDENT U. S. GRANT
This is the Southern Façade which measures 710 feet from tower to tower. Eastern, western, and northern façades comparable with this in length are designed for the completed structure, which will be larger than any building in the world to-day even the Escorial of Spain or the National Capitol at Washington

GENERAL GUIDE
TO THE
EXHIBITION HALLS
OF THE
AMERICAN MUSEUM OF NATURAL HISTORY

BY
FREDERIC A. LUCAS, Director
Assisted by Members of the Museum Staff



GUIDE LEAFLET SERIES No. 40

MARY CYNTHIA DICKERSON, *Editor*

New York, November, 1914
Published by the Museum

The first General Guide to the Collections, comprising 54 pages and 16 illustrations, was issued in January, 1904.

The second General Guide, of 96 pages and 54 illustrations, was published in November, 1911.

The third edition consisted of 116 pages and 63 illustrations and was issued in July, 1913.

The present edition comprises 127 pages and 65 illustrations.

A list of the popular publications of the Museum will be found at the end, beginning on page 125.

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The halls are named according to the position they will have in the completed Museum building which will consist of four long façades facing east, west, north and south respectively, each connected with the center of the quadrangle formed, by a wing extending between open courts. Thus the hall at the eastern end of the south façade (the only façade completed) becomes the "southeast pavilion."

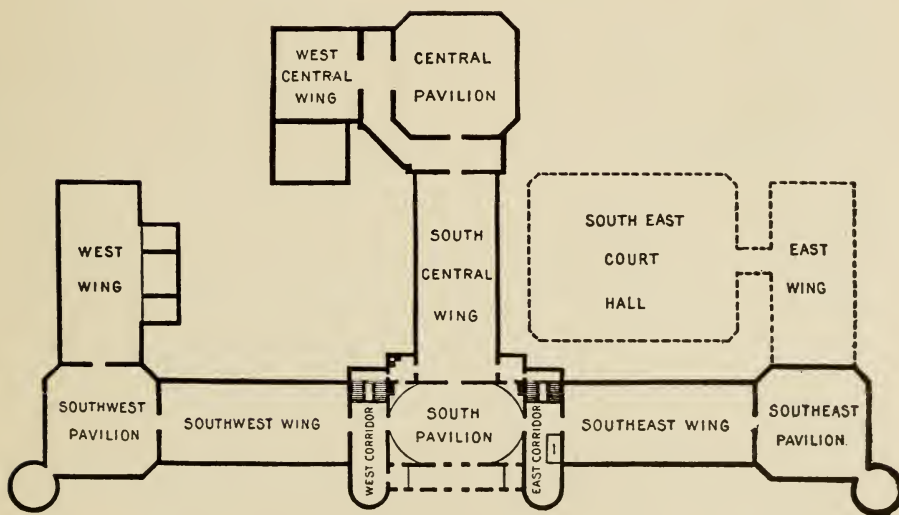
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Prefatory Note

It is the purpose of this GUIDE to call attention to the more important exhibits that the visitor will see as he passes through the halls. More detailed information regarding the specimens may be obtained from the labels or from the *Guide Leaflets*.

It is frequently necessary to rearrange the exhibits in order to provide space for new material or to put into effect advanced ideas regarding methods of exhibition, and as these changes are taking place all the time, it unavoidably happens that now and then discrepancies will be found between the actual arrangement of the exhibits and that noted in the GUIDE. Dr. Goode has said that a finished museum is a dead museum, and it is hoped that the visitor will look upon these necessary changes as indications of life and progress.



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GENERAL GUIDE TO THE MUSEUM

INTRODUCTION

The History and Work of the Museum

THE American Museum of Natural History was founded and incorporated in 1869 for the purpose of establishing a Museum and Library of Natural History; of encouraging and developing the study of Natural Science; of advancing the general knowledge of kindred subjects and to that end, of furnishing popular instruction.

History

For eight years its temporary home was in the Arsenal in Central Park. The corner stone of the present building in Manhattan Square was laid in 1874 by President U. S. Grant, and in 1877 the first section (South Central Wing) was completed.

Location

The Museum is located at 77th Street and Central Park West, and can be reached by the 8th or 9th Avenue surface cars, the 6th or 9th Avenue elevated to 81st Street station, or by the subway to 72nd or 79th Street station. The Museum is open

Hours of Admission

free every day in the year; on week days from 9 A. M. to 5 P. M., on Sundays from 1 to 5 P. M.

The Museum building is one of the largest municipal structures in the City, and has cost approximately \$5,000,000. The South Façade is 710 feet in length; the total area of the floor space is 470,789 square feet, or about 10 acres, of which 271,886 square feet are open to the public. The building when completed is designed to occupy all of Manhattan Square.

The building is erected and largely maintained by the City, through the Department of Parks. Building funds are provided for by issues of Corporate Stock, which have been made at intervals since 1871. The annual appropriation, known as the Maintenance Fund, is devoted to the heating, lighting, repair and supervision of the building and care of the collections.

Administration and Support

The Museum is under the control of a self-perpetuating Board of Trustees, which has the entire direction of all its activities as well as the guardianship of all the collections and exhibits. The Trustees give their services without remuneration.

The funds which enable the Trustees to purchase specimens, to carry on explorations and various forms of scientific work, to prepare and publish scientific papers and to enlarge the library are raised by contributions from the Trustees and other friends. These contributions come from three sources—namely, (1) the Endowment Fund, (2) Membership Fund, (3) voluntary subscriptions.

The interest of the Endowment Fund, which includes the magnificent bequest of Mrs. Jesup, may be used for additions to the collections, research, and for publication. It can not be used for the care or repair of the building, construction of cases or other maintenance work, that is properly the province of the city to provide for.

The Membership Fund, derived from the subscriptions of Members, may be devoted to any purpose and is of particular importance in the educational work of the Museum.

Voluntary contributions may be used for general purposes or for such special object as the donor may designate; some of the most valuable and important collections have been obtained by such gifts.

There are at present about 3,700 Members. Annual Members contribute \$10 a year for the support of the Museum; Life Members make a single contribution of \$100. **Membership** fees are of great service in promoting the growth of the institution.

In the last edition of the Century Dictionary a museum is defined as: "A collection of natural objects, or of those made or used by man, placed where they may be seen, preserved and studied. **Definition of a Museum** Neither the objects themselves, nor the place where they are shown constitutes a museum; this results from the combination of objects, place and purpose, display being an essential feature. The objects, or specimens, may be shown for general purposes only, or for the illustration of some subject or idea, the tendency of modern museums, being by the display of objects and the manner in which they are arranged and labeled to illustrate some fact in nature or in the history of mankind."

And E. Ray Lankester has very clearly stated that:

"The purposes of a great national museum of natural history are (1) **Purposes of Museums** To procure by its own explorers or by the voluntary assistance of independent naturalists the actual specimens upon which accurate knowledge of the animals, plants, and minerals of the earth's surface, and more especially of the national territory, is based; to preserve and arrange these collections for study by all expert naturalists, and to facilitate, directly or indirectly, the publication (in the form of catalogues or monographs) of the knowledge so obtained—with a view to its utilization, not only in the progress of science, but in the service of the State. (2) To exhibit in the best possible way for the edification of the public, at whose charges these collections are made and maintained, such specimens as are fitted for exposure in public galleries, with a view to the intelligent and willing participation of the people in the maintenance of the Museum."

The Museum not only maintains exhibits "for the edification of the public," but supplements the educational work performed by these and their accompanying labels, by lectures and publications of a popular nature. A course of evening lectures is given every Spring and Fall for the Members, to which admission is to be had by ticket; another series of lectures, free to the public, is given in conjunction with the Board of Education on Tuesday and Saturday evenings. Still another series, under the direction of the Museum's Department of Public Education, is given for the children in the Public Schools, and there are special lectures for the blind provided for by the Thorne Memorial Fund. The educational work of the Museum is carried still farther by means of its circulating collections for illustrating nature study which are sent free to the schools of Greater New York. The extent to which these collections are used is shown by the following statistics for the last five years:

	1909	1910	1911	1912	1913
Number of Collections in use	435	390	512	537	597
Number of Schools of Greater New York Supplied	419	334	486	491	501
Number of Pupils studying the collections	922,512	839,089	1,253,435	1,275,890	1,378,599

The scientific side of the work of the Museum is based upon its explorations and study collections.

The Study Collections, as the name implies, are not only for the benefit of students but preserve a record of our vanishing animal life and of the life and customs of our own and other primitive peoples.

In the case of Natural History the vast majority of the specimens are in the study series, not only because they would ultimately be ruined by exposure to light but because the display of all material would only confuse the visitor. Moreover, no museum has room to show everything, and a careful selection is made of objects of the greatest educational value and these are so displayed as to enhance their interest and attractiveness.

The Study collections are, briefly, as follows;

Anthropology.—ETHNOLOGY.—On the attic floor of the west wing and the northwest pavilion there are thirty-three fire-proof store rooms containing the ethnological study collections of more than 100,000 catalogue numbers, comprising extensive series for the Philippine Islands, Siberia, China, Pacific Islands, Africa, South America and the various culture areas in North America.



CHILDREN STUDYING MOOSE GROUP
Illustrating the use of the museum by the public schools

Archæology.—In archæology there is a large type series of stone objects from the various States of the Union. Full collections from excavated sites in British Columbia, Washington State, New York State, Kentucky, Arizona and New Mexico are here, together with a special series from the Trenton Valley. There is much material from Mexico, Peru and Bolivia.

The human skeleton material is chiefly from western States and South America. About two thousand crania have been classified and made available for study.

Geology and Invertebrate Palæontology.—The study collections comprise, among other things, the Hitchcock series of rocks illustrating thirteen geological sections across the States of Vermont and New Hampshire; a complete set of duplicate specimens from the United States geological survey of the Fortieth Parallel; a series illustrating the early geological survey of Pennsylvania; a complete typical series of rocks and microscopic thin sections illustrating Rosenbusch's manual of petrography; large series of American rocks; a complete series typifying the rocks encountered in driving the Simplon tunnel, Switzerland; many ores and economic specimens.

Invertebrate Palæontology.—Great numbers of fossil invertebrates, too numerous and varied to particularize, but representing many of the important groups.

Ichthyology and Herpetology.—**ICHTHYOLOGY.**—The collection of fishes comprises about 7,000 catalogued specimens, preserved in alcohol and kept in tanks and jars.

The fossil fish collection is one of the largest, if not the largest, in America, comprising about 10,000 catalogued specimens; it includes the Newberry, the Cope and several smaller collections.

HERPETOLOGY.—The collection of frogs, salamanders and reptiles numbers 9,000 specimens.

Invertebrate Zoölogy.—**GENERAL INVERTEBRATES.**—About 60,000 specimens of protozoans, sponges, polyps, starfishes, sea-urchins, worms, crustaceans, spiders, myriapods and chordates.

INSECTS.—(a) Local collection comprising insects known within fifty miles of New York City. (b) General collection including more than 500,000 specimens, among them the types of many species.

SHELLS.—The chief Molluscan collections of the Museum, exclusive of fossils. About 15,000 species are represented, comprised for the most part of the Jay and Haines collections.

Mammalogy and Ornithology.—**MAMMALOLOGY.**—The study collection of mammals contains about 25,000 skins, skulls and skeletons. It is especially rich in South American forms. Mexico and the Arctic are well represented; from the latter region there is a large and unique series of the beautiful white Peary's caribou and of the Greenland muskox, comprising about 150 specimens. The collection of whales is likewise noteworthy.

Ornithology.—The study collection of birds consists of approximately 90,000 unmounted skins, about nine-tenths of which are from the Western Hemisphere, and several thousand nests and eggs. South America is chiefly represented by a large collection from Matto Grosso, Brazil, and extensive collections from Colombia; also smaller series from Ecuador, Peru, Venezuela and Trinidad.

From North America, there are important collections from Mexico, Nicaragua, California, Texas, Arizona and the Middle Atlantic States—the Rocky Mountain region being most poorly represented. Of special collections, the George N. Lawrence and Maximilian collections are of special importance from the hundreds of type specimens which they contain.

Mineralogy.—Most of the mineral specimens are on exhibition, but the overflow from the public cases forms a study series of no mean proportion.

Public Health.—Living bacteria are maintained and distributed free to recognized laboratories.

Vertebrate Palæontology.—The study collections comprise about 15,000 catalogued specimens of fossil mammals, 6,000 fossil reptiles and amphibians and a few hundred fossil birds. Most of these are from the western United States. The collections of fossil horses, Eocene mammals and Cretaceous dinosaurs are unrivaled. The fossil rhinoceroses, camels, oreodonts, carnivora, Fayûm, Pampean and Patagonian mammals, Jurassic dinosaurs, Permian reptiles, turtles, etc., are likewise of the first rank. They include more than nine hundred type specimens of fossil mammals and several hundred type specimens of fossil reptiles and amphibians.

The Museum Library, located on the fifth floor, contains about 70,000 volumes on various branches of natural history (save botany), anthropology and travel. It is particularly strong in vertebrate palæontology and scientific periodicals. Like other museum libraries, it is of necessity a reference library, but, except on Sundays and holidays, may be freely used by the public during the hours when the Museum is open.

The publications of the Museum, aside from the *Annual Report*, fall naturally into two groups: scientific and popular. The former, comprising the *Memoirs*, *Anthropological Papers* and *Bulletin*, contain information gathered by the various expeditions, or derived from the study of material collected; they are from the nature of their subjects mainly of a technical character. The *Memoirs* consist of the larger, more important papers, or those that call for unusually large illustrations. These are issued from time to time as occasion may demand. The *Bulletin* comprises the shorter papers, those that contain information that it is desirable to issue promptly, and a volume of about 400 pages is issued annually. The scientific papers are distributed, largely in exchange, to museums and libraries throughout the world.

The popular publications include the *Journal*, *Leaflets*, *Guides* and *Handbooks*, and are intended for the information of the general public. The *Journal*, begun in 1900, is the means of promptly informing the Museum Members of the work of the institution, giving the results of the many expeditions, telling of the collections made, or more important information gathered. It also describes at length interesting or noteworthy installations, and notes the accessions to the various departments, changes in the personnel of the Museum, and elections to Membership. The *Illustrated Guide Leaflets* deal with exhibits of particular interest or importance, such as the Habitat Groups of Birds, the Evolution of the Horse, Meteorites, the Indians of Manhattan, calling attention to important objects on exhibition and giving information in regard to them. The *Handbooks*, the first of which, on the Indians of the Plains, was issued in 1912, deal with subjects or topics rather than objects. Thus the Plains Indians Handbook, by Dr. Wissler, is not merely a guide to the exhibition hall, but tells of the life and customs of these Indians, their language, political organization, religious beliefs and ceremonies.

The distribution of these popular publications is a part of the educational work of the Museum, as are the exhibits and lectures, and so far they have been necessarily sold below the cost of publication, as is done by other Museums. (*See list at end of this Guide.*)

An important part of the Museum, not seen by the public, is the work-
Workshops shops, located in the basement and provided with machinery of the most improved pattern. Here, among other things, are constructed the various types of cases used in the Museum, including the light, metal-frame case, devised in the institution.

Still other rooms, which, of necessity, are not open to the public, are the laboratories, wherein is carried on the varied work of preparing exhibits, work which calls for the services of a very considerable number of artists and artisans.

Here are cast, modeled, or mounted the figures for the many groups from Man to Myxine, here leaves are made to grow and flowers to bloom as accessories for beasts,* birds and fishes, to say nothing of reptiles and amphibians, and here, with painstaking care, are slowly created in glass and wax the magnified copies of invertebrates.

From all this it may be gathered that a museum is a very busy place, much more so than the casual visitor is apt to imagine. In fact, a very good museum man has said that a museum is much like an iceberg, seven-eighths of it under water and invisible. We will now proceed to the visible eighth.

*See Guide Leaflet No. 34.

Before entering the Museum one notices the "Bench Mark" established by the U. S. Geological Survey in 1911 on which is inscribed the latitude and longitude, $40^{\circ} 46' 47.17''$ N., $73^{\circ} 58' 41''$ W., and height above sea level, 86 feet.

On the right is a "pothole" from Russell, St. Lawrence Co., N. Y., formed by an eddy in the waters of a stream beneath the melting ice of the glacier that covered Northern New York. The stream carried pebbles that, whirled around by the eddy, cut and ground this hole, which is two feet across and four feet deep.

On the left is a large slab of fossiliferous limestone from Kelleys Island in Lake Erie near Sandusky, whose surface has been smoothed, grooved and scratched by the stones and sand in the bottom of the vast moving ice sheet or glacier that covered the northeastern part of North America during the Glacial Epoch. The front of this continental glacier is now thought by most geologists to have retreated northward across Lake Erie from 30,000 to 50,000 years ago. At Kelleys Island the ice was moving from east to west.

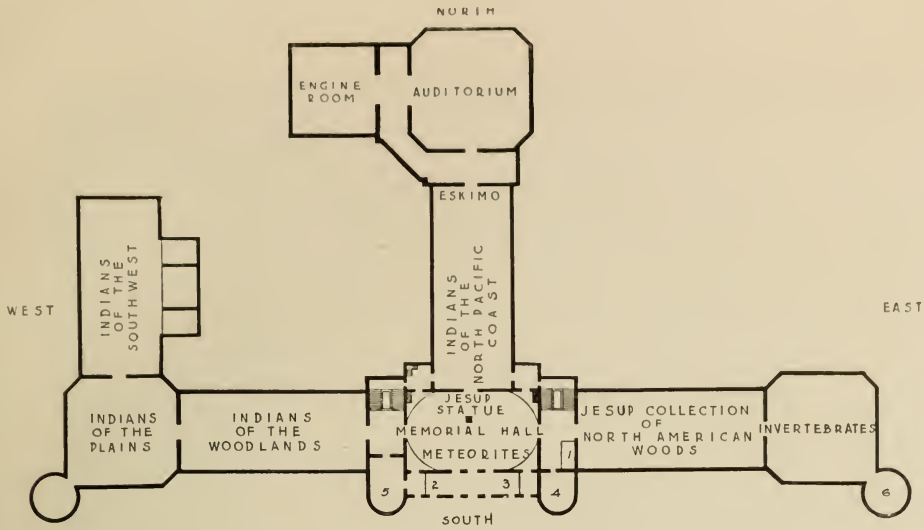


AT THE ENTRANCE TO THE MUSEUM



MEMORIAL STATUE OF MORRIS K. JESUP

Mr. Jesup, President of the American Museum of Natural History for more than a quarter of a century, was a staunch supporter of the institution's two aims, to be a great educational institution for the people and also a center for activity in scientific research



- | | |
|-----------------------|-------------------------|
| 1. Elevators | 4. Academy Room |
| 2. Information Bureau | 5. West Assembly Room |
| 3. Visitors' Room | 6. Collection of Corals |

FIRST FLOOR

SOUTH PAVILION

MEMORIAL HALL

The *Information Bureau* and the *Visitors' Room* are on either side of the south entrance. Wheel chairs for children or adults are available without charge. Postcards, photographs, guide leaflets, and Museum publications of various sorts are for sale, and visitors may arrange to meet friends here. On the right and left of the entrance are small *Assembly Halls* in which lectures to classes from the public schools of the City are given and where the New York Academy of Sciences and other scientific societies hold their meetings.

From the lobby the visitor first enters *Memorial Hall* and faces the marble statue of Morris K. Jesup, third President of the Museum. Mr. Jesup was a founder, trustee and benefactor of the Museum and for twenty-seven years its President. Under his administration and through his liberality the Museum made rapid progress. This statue of Mr. Jesup was executed by William Couper and was presented to the Museum by the Trustees and a few other friends. The marble busts in the wall niches represent noteworthy pioneers of American science, and are the gift of Morris K. Jesup. These include



THE VISITORS ROOM

Where they may rest, meet their friends, write notes or purchase publications and post cards

Benjamin Franklin, statesman and natural philosopher, Alexander von Humboldt, geographer and geologist, Louis Agassiz, zoölogist, Joseph Henry, physicist, John James Audubon, ornithologist, Spencer Fullerton Baird, zoölogist and founder of the United States Fish Commission, James Dwight Dana, geologist, John Torrey, botanist, Edward Drinker Cope, paleontologist, Joseph Leidy, anatomist, and Robert E. Peary, Explorer.

Memorial Hall was once the lecture hall and here thousands have listened to Professor Bickmore.

Circling this same hall is a portion of the collection of meteorites, popularly known as "shooting stars," ranging in weight from a few pounds to 36 tons. The greater number of meteorites are stony, but the more interesting ones are composed chiefly of iron, while certain meteorites contain both stone and iron. The toughness of iron meteorites is due to the presence of nickel, and the fact that they were so difficult to cut led to the adoption of an alloy of nickel and iron in making the armor plate for battleships. Meteorites have a very definite structure and when polished (see specimens on the right with electric lamp) show characteristic lines which together with their composition are to the expert absolute proof that the specimens are meteorites.

"Ahnighito" or "The Tent" at the left is the largest known meteorite in the world, and was brought from Cape York, Greenland, by Admiral R. E. Peary. It weighs 36 tons, and its transportation to New York was an engineering feat. Opposite it at the right is the curiously pitted "Willamette" meteorite from Oregon which was the subject of a famous lawsuit. The smaller meteorites will be found in the Hall of Geology, fourth floor. [The collection of meteorites is described in *Guide Leaflet* No. 26.]

Ahnighito
Meteorite

Willamette
Meteorite

SOUTH CENTRAL WING

INDIANS OF THE NORTH PACIFIC COAST

North of Memorial Hall, that is to the rear of the Jesup statue, is the *North Pacific Hall*, where are displayed collections illustrating the culture of the Indians of the Northwest Coast of America and also of the Eskimo. These collections are arranged geographically so that in passing from south to north through the hall the visitor meets the tribes in the same sequence that he would in traveling up the west coast of North America.

Indians of
British
Columbia and
Alaska



NORTH PACIFIC HALL AND THE CEREMONIAL HAIDA CANOE

This canoe, dug out from a single tree trunk, is 64½ feet long, large enough to contain forty people with their baggage. The figures represent in physique, dress and action various Indian tribes of the Alaskan coast one hundred years ago, those standing are a Chilkat Chief and his followers, the paddlers are slaves, captured from other tribes. The canoe was brought to the Museum from the Skeena River, Alaska, in 1883

The most striking object is the great Haida Canoe in the center of the hall. In it is being constructed a group representing a party of Chilkat Indians on the way to celebrate the rite of the "potlatch." The potlatch is the great "giving ceremony," common to all the coast tribes, when individuals and families gladly impoverish themselves that the dead may be honored, the emblem of the clan exalted and social standing recognized or increased. At the stern of the canoe, which is represented as approaching the beach, stands the chief or "medicineman," who directs the ceremony. The canoe is a huge dugout made from a single tree, is $64\frac{1}{2}$ feet long and 8 feet wide and capable of carrying 40 men.

Against the pillars and walls of the hall are many house posts and totem poles with their grotesque carvings; the latter may represent either the coat of arms or family tree, or they may illustrate some story or legend connected with the family. The Haida Indians together with the Tlingit are recognized as superior in art to the other Indian tribes along the northwest coast of North America. They are divided into a number of families with various crests for each family and grouped into two main divisions, the Ravens and the Eagles. The

Tlingit are makers of the famous Chilkat Blankets, of which the Museum possesses an exceptionally fine collection.

Among some of the other tribes there is little wool weaving, the clothing consisting of shredded and softened inner tree bark braided and matted together. The Indians of this region are preëminently a wood-working people, as is manifest in the exhibit. Religious ceremonies and the wearing of masks generally

supposed to aid the shaman or priest in curing disease were customary among most of the tribes. The masks represented guardian spirits and by wearing them the shaman impersonated these spirits.

The north end of the hall is devoted to Eskimo collections. The cases on the right show the manner of



Modern totem pole at Wrangel, Alaska. Many totem poles are huge cedar carvings so old that the Indians themselves have forgotten their meaning



CHILKAT BLANKET

dress, method of transportation, etc., also cooking utensils and bonework.

Eskimo
Collections

Notice to what extent the utensils, weapons and clothing are made from the skin or bone of the seal, walrus and other Arctic animals. The case marked "Eskimo Woman Cooking" shows a section of the interior of a snow hut or igloo lined with sealskin, the mother preparing the food in a primitive stone vessel, heated by flame from seal oil in the stone lamp below. The opposite case shows an Eskimo woman fishing through the ice. She has formed a windbreak with blocks of ice. The fish-rod and hook, and the long ladle are made of bone, and with this latter she keeps the water in the hole from freezing over while she is fishing. In this section will be found collections obtained by the Stefanson-Anderson expedition from the Eskimo of Coronation Gulf, some of whom had never seen a white man.

Mural
Decorations

The mural decorations of Arctic scenery are by Frank Wilbert Stokes; the mural decorations illustrating the industries and ceremonies of British Columbia and Alaska are by Will S. Taylor.

Auditorium

The doorway at the north end of the hall leads to the *Auditorium* which has a seating capacity of 1400, and is equipped with two screens, 25 feet square, for stereopticons. Free public lectures are given here Tuesday and Saturday evenings from October to May under the auspices of the Board of Education. There are also special



ESKIMO HOME SCENE

There are two instructive groups near the entrance to the Auditorium and underneath the Stokes Mural paintings of the Land of the Midnight Sun. In one, a home scene within a snow house or "igloo," an Eskimo woman is cooking blubber over the flame from a seal oil lamp, the other represents an Eskimo woman fishing through the ice. The Museum is rich in Eskimo collections

lectures for Members of the Museum as well as lectures for school children. At the entrance of the lecture hall is appropriately placed a bust of Professor Albert S. Bickmore, originator of the movement that resulted in the erection of the Museum, first curator, and founder of its lecture system.

In the adjoining corridor is a collection of the principal building stones of the United States, and specimens of petrified wood from the fossil forest of Arizona.

At the end of the corridor is the power room where may be seen demonstrated the transformation of the potential energy of coal
 Power Room into heat, light and motion.

WEST CORRIDOR

To the right or west of the Jesup statue are three halls devoted to Indian collections. To reach these the visitor passes through the *West Corridor* which is devoted to the temporary display of recent acquisitions or small collections of particular interest. Here hangs a series of paintings of Mount Pelée, by the late Angelo Heilprin.

On the landing, at the head of the stairway is the William Demuth collection of pipes and fire-making appliances from many parts of the world.

SOUTHWEST WING

INDIANS OF THE WOODLANDS

The halls to the west contain collections from the North American Indians and together with the hall in the south central wing present the nine great culture areas of North America. (See maps on the south wall.) The hall you now enter represents chiefly the Indians in the Southeastern and Eastern Woodland areas, or all those formerly living east of the Mississippi River and south of the Great Lakes. They are, therefore, intimately connected with the early history of the colonies. In the eastern section of this hall, are the New York State Indians of whom the Iroquois are the most important because of their superiority in organization and power.

The League of the Iroquois, or the Five Nations, comprised the Mohawk, Seneca, Oneida, Onondaga and Cayuga, later the Tuscarora, when it was styled the Six Nations. This league was formed probably as early as 1539 and with the purpose, as its founders boasted, of bringing peace and breaking up the spirit of perpetual warfare. The Oneida Indians were the only members of this league who, as a tribe, adhered to the colonists in the war of the Revolution.

In the wall case on the right are shown the dress, occupations and dwellings of the Iroquois. A life-size model of an Iroquois representing a messenger is holding out a belt of wampum. This wampum, made chiefly of the shells of the "quahog" or common hard clam of our markets, was utilized in various ways: it was greatly prized as an ornament and as trimming on garments; was an important feature



Carved birch bark kettle of the Penobscot Indians



IROQUOIS MASK *

in religious ceremonies and festivals, being the token by which the Indians kept records; and was the object by which public transactions were commemorated. Wampum was not used as currency, however by the Indians who had no standard of value until they found it in our currency, but it did come nearer currency than any other kind of property and when sold to white settlers the strings were counted and reckoned at half a cent a bead. The woman in the right of the case is pounding corn in a primitive mortar. The matrons of the Iroquois possessed

property of their own in distinction to that held by their husbands; they sat in council by themselves and had the right to terminate a war.

* The story of this particular false face, with its mouth twisted to one side, is as follows: When Haweniyu had made the earth, he wandered about over its surface contemplating his work. As he went along he met a False-face Being, who rudely demanded what Haweniyu was doing on his earth. The god indignantly replied that he had made the world. This the False-face Being denied, so after more discussion they decided upon a contest. They stood in the middle of a valley, and in order to show his power the False-face Being said, pointing to the mountains at one side, "Do you see those hills over there?" "Yes," replied Haweniyu. "Come here," said the Being to the hills, and immediately the hills came over and stood a few feet away. Haweniyu in his turn addressed not the cliffs but instead said to the False-face Being, "Turn around and see," and the False-face turned, and at the same time the god caused the hills on the other side of the valley to move up so swiftly and so close that they struck the False-face on the side of his countenance and twisted his mouth into the position it has held ever since. The Being then acknowledged the superior power of Haweniyu, and the god said that the False-faces might ever after live at the ends of the earth provided that they would not interfere with the children of men who were soon to be placed in the world. This the False-face Being agreed to with the promise that they would drive away witches and diseases and protect mankind.

On the left is a collection of grotesque masks. These were worn by the False Face Societies. The Indians were very superstitious and believed in the existence of demons or evil spirits who were without bodies, legs or arms, and possessing hideous faces only, were characterized as "false faces." There eventually grew up a society calling itself the "False Face Band" whose members were supposed to have power to counteract the evil done by these demons and to possess the capacity to heal sickness. Pictures by De Cost Smith illustrating the performances of this society are on exhibition in the cases.

The earliest Indians of the vicinity of New York City are represented by the archæological collections in the first alcove on the left. Here will be seen remnants of their crude pottery, weapons, cooking utensils, and various implements made of stone, wood or bone, collected chiefly from burial sites on Manhattan Island, Staten Island and Long Island. In one of the cases is a portion of an original dugout canoe which was excavated in Oliver Street in 1906 when a telephone conduit was being laid. This canoe and a large earthen pot are among the very few good specimens that have been found representative of New York City Indians.

Among the Delaware collections is a doll that was worshipped by this tribe as the guardian of health. Indians of the vicinity of New York City mostly belonged to this tribe.

In other parts of the hall, in approximate geographical order will be found typical exhibits from the Penobscot, Delaware, Shawnee, Potawatomi, Ojibwa, Menomini, Saukteaux, Eastern Cree, Winnebago, and Sauk and Fox of the Eastern Woodland Area, and the Seminole, Cherokee, and Yuchi of the Southeastern Area. In the south wall cases are small exhibits from the Mackenzie and Plateau culture areas for which a special hall will be provided in the future. The Seminole have never been entirely conquered. A part of them escaped deportation to Oklahoma and fled to Florida and have taken up their abode in the Everglades, hostile to the white men whom they will not allow to enter their domain. This exhibit is one of the three existing collections from the Seminole Indians.

Among the Menomini specimens there is an excellent collection of medicine bags, porcupine quill work and a buffalo skin headdress worn by the noted chief Oshkosh. The Menomini have always been friendly to the Americans.

The Ojibway and Menomini are typical Woodland Indians. They made maple sugar, gathered wild rice, worked in birch bark, and practiced a rather complex religion.

At the rear of the hall will be found collections from the Eastern Cree of James Bay and vicinity. While these people live in the woodlands and have a culture of that type, another division of the same people lives



Painted by George Catlin

AN OSAGE CHIEF AND TWO OF HIS WARRIORS

in the northern Plains and has a different culture, as may be observed by stepping inside the next hall.

In this, and the adjoining hall will be found many paintings by George Catlin, part of a series of four hundred, illustrating the life and ceremonies of the Indian of North and South America. They were presented to the museum by Ogden Mills.

[The Indians of Manhattan and vicinity are described in *Guide Leaflet* No. 29.]

SOUTHWEST PAVILION

INDIANS OF THE PLAINS

The collections from the Indians of the Plains will be found in the hall adjoining. These Indians comprised the tribes living west of the Mississippi and east of the Rocky Mountains as far south as the valley of the Rio Grande and as far north as the Saskatchewan. (See map on south wall.)

They include among others the Plains-Cree, Dakota, Crow and Blackfoot shown on the left of the hall, and the Mandan, Pawnee, Kiowa and Cheyenne on the right. Most of these tribes were dependent on the buffalo, so much so that they have sometimes been called the "Buffalo Indians." Buffalo flesh was their chief

Indians of the
Plains



A BLACKFOOT TIPI, OBTAINED IN MONTANA, 1903

The interior shows the family life of a Blackfoot Indian. The man and women are engaged in household tasks, a tobacco board and pipe are in place for guests; on the family altar, just back of the fire, some incense may be seen burning as a religious rite. Tipis were originally made of buffalo hide, but this animal, having been practically exterminated, they are now made of duck or cotton cloth. This tipi was made about 1874 and used for more than a year by Heavy-runner, a noted Blackfoot Indian.

food, and of buffalo skin they made their garments. In some cases a buffalo paunch was used for cooking and buffalo horns were made into various implements of industry and war. The spirit of the buffalo was considered a powerful ally and invoked to cure sickness, to ward off evil, and to give aid in the hunt. Whenever the buffalo herds led the way, the more nomadic Plains tribes moved their tents and followed. With the extermination of the buffalo the entire life of the Plains Indians was revolutionized.

In the center of this hall is a Blackfoot Indian tipi with paintings of
Blackfoot otters on the sides, representing
Tipi a vision of the owner. This
 tipi has been fitted up to show the home life of a typical Buffalo hunting Indian.

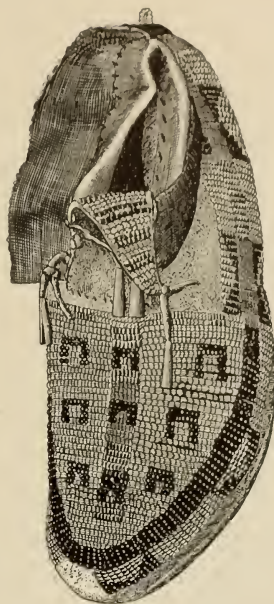
There were numerous soldier societies among the Plains Indians which included
Societies practically all the adult males.

Each society had a special dance and special costumes. (See the Arapaho cases for costume dancers.) There were other dances connected with tribal religious ceremonies, the best known and most important of which is the sun dance

Sun Dance illustrated by a model at the left of the tipi. The sun dance was held annually in the early summer in fulfillment of a vow made during the preceding winter by some member of the tribe who wished a sick relative to recover. The dance involved great physical endurance and excruciating self-torture, lasting three days, during which time the dancers neither ate nor drank.

In the center of the hall is a genuine medicine pipe, held in awe by
Medicine the Indians and dearly parted with; also the contents of a
Pipe medicine pipe bundle. The contents of another medicine
 bundle, belonging to a leading man of the Blackfoot tribe (medicine man), together with the headdress which he wore in ceremonies, is in a case near the tower.

The Plains Indians are noted for their picture writing on skins and for their quillwork which has now been superseded by beadwork. They have a highly developed decorative art in which simple geometric designs are the elements of composition, this being one of the most interesting features of their art. (See Dakota case.) [See *Handbook* No. 1. North American Indians of the Plains.]



A beaded moccasin from the Indians of the Plains (Gros Ventre)

WEST WING

INDIANS OF THE SOUTHWEST

On the left are collections from the sedentary Indians who occupy the pueblos of the Rio Grande and of Hopi, Acoma and Pueblo
Indians Zuñi; and also the objects recovered from the prehistoric pueblos, caves, and cliff-dwellings. On the right are the nomadic Indians — the eastern and western Apache, the Navajo, the Pima, the Papago, and several tribes of northern Mexico. In the south annex will be found baskets from the Indians of California.

The sedentary Indians live in large community houses often with several receding stories, built of stone or adobe. They depend chiefly upon agriculture for their food, make a great variety of pottery, and have many elaborate religious ceremonies. The nomadic peoples live in tipis or small brush and thatched houses which are moved or deserted when they are forced to seek the wild game and wild vegetable products which furnish much of their food. They make baskets for household purposes which are more easily transported than vessels of clay. There are models in the hall of the pueblos of Taos and Acoma, of prehistoric cliff-dwellings and of the houses used by the Navajo and Apache. In the first alcove on the left is shown the pottery of the villages along the Rio Grande, the principal art of the region, skin clothing, household utensils and ceremonial objects.

The upright cases of the next alcove are filled with wonderful prehistoric pottery. That in the wall case is from Pueblo Bonito. Similar gray and white ware with very elaborate and splendidly executed designs in an adjoining case are from Rio Tularosa, one of the upper tributaries of the Gila, where a vanished agricultural people once lived in pueblos and cliff-dwellings. A third case has pottery from the Casas Grandes of Chihuahua, Mexico, which represents the southern limit of the southwestern ancient culture. In the table case and in a case standing in the aisle are shown the wonderful art work in turquoise, shell, stone and wood of the former inhabitants of Chaco Cañon. These objects, as well as the pottery from Pueblo Bonito mentioned above, were secured by the Hyde Expedition.

In the next alcove, devoted to the Hopi, are the costumes, masks, images, and plaques used in their ceremonies. Besides the well-known snake dance, the various Hopi villages have many interesting ceremonies, many of which are concerned with the rainfall and their crops.

The inhabitants of Zuñi are believed to be the descendants of the first people seen by the Spanish in 1540. Their former villages, many of which are now in ruins, were probably the "Seven Cities of Cibola," for which Coronado was searching at that time. Although they had missionaries

among them for about three centuries, they have retained many of their own religious ceremonies. In the cases of the last alcove on the left are shown the woven costumes of Acoma and pottery from that pueblo. In the last case on this side of the hall are examples of Zuñi pottery, both ancient and modern.

The Pima, east side of the hall, practiced irrigation, raising by its aid the corn and beans on which they relied for food and the cotton which they used for their scanty garments. The Papago, with whom they are closely associated, occupied the more arid portions of southern Arizona and northern Sonora, securing their living from such desert products as the giant cactus, the century plant, the yucca and the mesquite and small game. Examples of their food, basketry, pottery, and ceremonial articles are shown.

The Navajo, a large and widely scattered tribe, inhabit much of the country drained by the San Juan and Little Colorado rivers. During the winter they occupy houses like the one standing in the large annex; but in milder weather, camp with the slight shelter of a cliff or a wind break and shade made of brush. They live by raising corn in the moist valley and on the flesh of their numerous flocks of sheep.

They are the present-day blanket makers of North America. They make use of the wool of the sheep they raise, carding, spinning, and weaving it by means of the simplest implements and looms. This art is believed to have arisen since the coming of the Spanish and it is known to have passed through several stages in the last sixty years. The older types of blanket here shown contain yarn which was obtained by cutting or ravelling from imported flannels called in Spanish, bayeta, from which the blankets of this sort receive their name. These are either bright red or old rose in color, resulting from cochineal dye. Several blankets are made of yarn bought ready dyed from the traders and are called Germantowns. The greater number, however, contain yarn of native spinning, dyed with native vegetable and mineral dyes.

The Navajo are also expert silversmiths. Their tools and samples of workmanship are displayed in a case in the center of the hall.

The Western Apache live in thatched houses, an example of which stands at the further end of the hall. They occupy the upper portion of the Gila and Salt rivers where they practice agriculture, gather the wild products and hunt. These were the people who, under Geronimo, raided the settlements of southern Arizona and Northern Mexico and evaded our troops for years.

The Eastern Apache lived in buffalo skin tipis. They went far out on the plains in search of the buffalo herds, avoiding, if possible, the plains tribes, but fighting them with vigor when necessary. In dress and outward life they resemble the plains Indians, but in their myths and ceremonies



An attractive Navajo blanket from the Museum's valuable collection. The Navajo Indians of the Southwest are a wealthy pastoral people, and the best Indian blanket makers of North America

they are like their southwestern relatives and neighbors. The baskets of the Apache are shown in the large end case which is in contrast with the corresponding case on the other side of the hall. Not the environment but social habits caused one people to develop pottery and the other to make the easily transported and not easily breakable baskets. [See *Handbook*, Indians of the Southwest.]

[Return to the *Jesup Statue*.]

EAST CORRIDOR

POLAR MAPS

Leaving the statue on the left and "Willamette" meteorite on the right and going east the visitor enters the corridor where the elevators are located (*East Corridor*). Here will be found maps of the north and south polar regions showing the routes of explorers. On the wall by the north polar map are the sledges used by Admiral Peary in his last three expeditions in search of the North Pole. The Morris K. Jesup sledge which the Admiral used in his successful polar expedition is the one nearest the entrance. The various sledges in their differences of style show the persistent effort made by Admiral Peary to bring the sledge up to its greatest possible usefulness. That he was successful on his last trip was in part due to the final modification.

On the opposite side of the doorway is one of the sledges used by Amundsen on his journey to the South Pole. [A history of south polar expeditions is given in *Guide Leaflet* No. 31.]

In a room at the north end of this corridor is the large Mainka seismograph, for recording the occurrence of earthquakes. This was given to the New York Academy of Sciences by Emerson McMillin, and by the Academy deposited in the Museum.

SOUTHEAST WING

JESUP COLLECTION OF NORTH AMERICAN WOODS

To the east of the elevators is the *Hall of North American Forestry* containing the Jesup Collection of North American Woods, a nearly complete collection of the native trees north of Mexico, presented to the Museum by Morris K. Jesup. On the right is a bronze tablet, by J. E. Fraser, the gift of J. J. Clancy, depicting Mr. Jesup as he walked in his favorite wood at Lenox, Mass.

To the left is a section of one of the Big Trees of California, sixteen feet in diameter and 1341 years old. It began its growth in the year 550, so that it was nearly a thousand years old before America was even dis-



WILD PLUM IN THE FORESTRY HALL

Each of the five hundred species of trees in North America is represented by a section of trunk five feet long, some of a diameter not found in the country's forests to-day. Many of the specimens are accompanied by wax models of leaves, flowers and fruits accurately reproduced from life

covered. The specimens show cross, longitudinal and oblique sections of the wood finished and unfinished, and the labels on the specimens give the distribution of the species, the characteristics of the wood and its economic uses. The trees are grouped by families and the location of each family will be found on the floor plan at the entrance of the hall. The reproductions of the flowers, leaves and fruits in natural size are instructive. This work is done in the Museum laboratories. Note the character of forests as shown by the transparencies. [For fuller information in regard to this hall see *Guide Leaflet No. 32.*]

SOUTHEAST PAVILION

INVERTEBRATES

At the extreme east is the *Darwin Hall*, devoted chiefly to the invertebrate animals (those which do not possess a backbone) and to groups illustrating biological principles. Facing the entrance is a bronze bust of

Synoptic Series

Darwin by Wm. Couper presented by the New York Academy of Sciences on the occasion of the Darwin centenary in 1909.

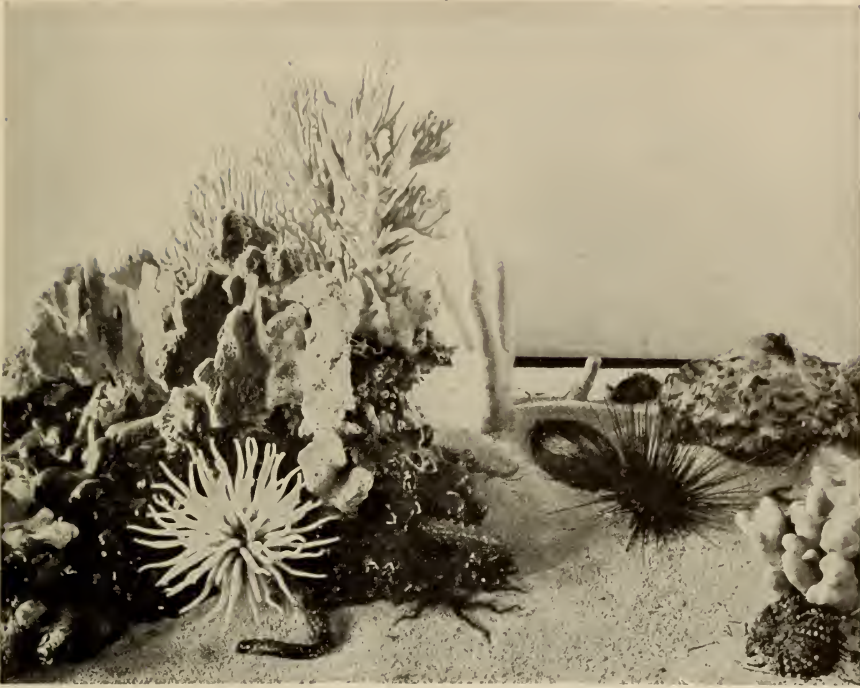
Passing around the hall from left to right, the progression is from the lowest forms of animal life, the one-celled Protozoa, to the highest and most complex forms of animal life, the Primates, including man. The distinctive characteristics of each group are fully described on the alcove and case labels. Many of the minute forms are represented by skilfully prepared models in glass and wax showing the animal many times enlarged. Thus the visitor may obtain an idea of the form and structure of these animals which in spite of their small size have in so many instances such a vital influence on the life of man.



European commercial sponge comparable with the Florida yellow sponge or "Hardhead." The sponge industry in both the Mediterranean and the Bahama region is almost destroyed by careless methods, and conservation must be practiced here as in other of the world's resources



A PART OF THE WHARF PILE GROUP



Marine Habitat Group. A community of starfishes, sea anemones, sea urchins, corals and sponges as seen below the edge of a coral reef in the Bahamas

This alcove contains the lowest forms of animal life. All are single-celled individuals. The simplest kinds are abundant in swamps and stagnant water, others are found in myriads in the sea while the ocean bottom in many localities is covered with them. The specimens exhibited in this alcove are mainly models, some of which are enlarged more than a thousand diameters.

Alcove 1
Protozoa

Sponges are principally of two kinds — those with skeletons or supporting structures of silica (i. e. flint) and those with skeletons of horn. The sponges of commerce belong to the latter class. In the specimens exhibited the skeleton only can be seen, the living tissue having been removed. Many of the “glass” sponges are very beautiful in design. Sponges range in size from the tiny *Grantia* of the New England coast to the gigantic “Neptune’s goblets” found in the eastern seas. This alcove contains certain specimens whose tissue is represented in wax tinted to show the natural coloring of sponges, which varies from the bleached yellowish color commonly seen to deep brown or black, or yellow and red, in varying shades.

Alcove 2
Sponges

In Alcove 3 are shown coral animals and their relatives: plant-like hydroids which often are mistaken for sea moss, but which really are a series of polyps living in a colony; jellyfishes with their umbrella-shaped bodies and long streaming tentacles; brilliant colored sea anemones, sea fans and sea plumes; the magenta colored organ-pipe coral, the stony corals, and the precious coral of commerce. Coral polyps mistakenly called "coral insects" are the animals that build up the coral reefs. In front of the window is a life-sized model in glass of the beautiful Portuguese Man-of-War. This organism is really a colony of many polyp individuals attached to one another, and specialized for various functions.

The best known species in this group is the tapeworm, whose development and structure are accurately shown by the models in the central case. As will be seen, its structure is more complex than that of preceding forms.

These are for the most part parasitic, living in the digestive canals of mammals. The most familiar is the common roundworm or intestine worm, *Ascaris*, an enlarged model of which is exhibited.

The minute wheel animalcules comprise many exquisite and grotesque forms, some of which construct tubes of gelatinous substance, sand-grains, etc. A few of the species are parasites, but most of them live a free, active life. They are aquatic and mainly found in fresh water.

The sea-mats in Alcove 7 are plant-like animals which lead the colonial form of life. The majority of the species are marine, although a few occur in fresh water. The lamp shells shown in this alcove superficially resemble clams, but by structure are more closely related to the worms and starfishes.

Alcove 8 is occupied by the starfishes, the sea urchins, sea cucumbers and sea lilies. The starfish is the pest of the oyster beds where it feeds on oysters and destroys them in large numbers. The brittle stars when handled or attacked are able to drop off an arm and later regenerate another. Sea urchins are an important article of food in Europe and the West Indies.

The annelids, typified by the familiar earthworm, are worms whose bodies are made up of rings or segments. They are inhabitants of both fresh and salt water, many kinds living in the mud and sand of the shore while others bore into wood and shells. The "houses" that these annelids build are often very beautiful and interesting. In the window is a group showing a section of a mud flat on the New England coast with the variety of worm life found in what to the casual observer seems to be an uninhabited area.

Arthropods include the familiar crabs, lobsters, insects and their relatives. The number of existing species in this group is greater than that of all the rest of the animal and vegetable kingdoms together. No other group comprises so many species useful or harmful to man. In the case in the center of the alcove is a model showing the anatomy of the common lobster, Crustaceans also enlarged models showing heads of various species of and Insects insects. On the wall are two of the largest specimens of lobsters that have ever been taken. They weighed when alive thirty-one and thirty-four pounds respectively. The largest of the arthropods is the giant crab of Japan, some of which, like that placed on the wall, have a spread of about ten feet.

The mollusks form a group second only to the arthropods in the vast number and diversity of forms which it embraces, including marine, fresh water and land animals. All mollusks have soft bodies but nearly all of them secrete a shell which in many species is of pearly material (mother-of-pearl). Well-known examples of this group are the common clam and oyster and enlarged models in the center case show the anatomy of these species. The largest species is the huge "bear's paw" or furbelowed clam of the eastern seas.

Vertebrates include the largest, most powerful and most intelligent of animals. This group culminates in man who still bears witness to his chordate ancestry in the retention of a chorda (cartilaginous spine), and gill clefts during embryonic life. Among these ancestral forms are the Ascidians, or Sea-squirts, an enlarged model of which is shown in the central case, while others are shown among the animals on the wharf-piles in the window group. The models in the central case show the development of the egg of typical vertebrates.

An exceptionally large specimen of beautiful madreporal coral is in the case near the entrance, and the associations of marine life that may be found among the coral reefs of the Bahamas are represented by several small groups in the center of the hall. Certain of the groups in this section of the hall illustrate various biological principles associated with the name of Darwin. The variation in form, size and color of the snail and the variation of the shell of the common scallop are graphically shown.

Four large models in the center of the hall show the mosquito which is the agent in the spread of malaria. These models represent the insect enlarged seventy-five diameters or in volume four hundred thousand times the natural size. The mosquito in its development undergoes a metamorphosis. The model at the left shows the aquatic larval stage; the larvæ are the "wigglers" of our rain water barrels. The next model is the pupal stage, also



A PORTION OF THE BULLFROG GROUP

Two frogs are engrossed in a chickadee on the birch branch above. The smaller frog seems likely to fall a prey to a black snake ready to strike from the white azalea near.

The scene is typical of Southern New England in July. The frogs and the reptiles are wax casts from life. The various activities of bullfrog life are set forth, with their relation to birds and small mammals, fish, snakes, turtles, insects and snails. The metamorphosis from the tadpole is also shown

aquatic. The third model is of the adult male mosquito which is harmless since it never bites man. The fourth model shows the adult female mosquito in the attitude of biting. In another case is a series of models showing the life cycle of the malarial germ in the blood of man and in the mosquito.

In several of the alcove windows are habitat groups of invertebrates illustrating the natural history of the commoner and more typical animals.

Window
Groups

In the Annulate Alcove is shown the Marine Worm Group reproducing these animals with their associates in their natural surroundings, as seen in the harbor of Woods Hole, Mass. The harbor and the distant view of Woods Hole village with the U. S. Fish Commission buildings are shown in the background, represented by an enlarged colored photographic transparency. In the foreground the shallow water of the harbor near the shore is represented in section to expose the animal life found on muddy bottoms among the eel-grass, as well as the chimneys of various worm-burrows. In the lower part of the group a section of the sea bottom exposes the worms within the burrows. Several species of these are represented. [*See Reprint.*]

Marine Worm
Group

In the Mollusk Alcove window is shown the natural history of a sand-spit at Cold Spring Harbor, Long Island, including some of the shore mollusks and their associates. The entrance of the harbor is seen in the distance. In the foreground at the edge of the sand-spit a mussel-bed is exposed by the receding tide over which fiddler-crabs are swarming into their burrows. Beneath the water surface an oyster is being attacked by a star-fish, while crabs and mollusks of various species are pursuing their usual activities.

Shore
Mollusk
Group

The window group in the Vertebrate Alcove shows the piles of an old wharf at Vineyard Haven, Mass. Below the low-tide mark the submerged piles are covered with flower-like colonies of invertebrate animals. Among these are sea-anemones, tube building worms, hydroids, mussels, sea mats and several kind of ascidians or sea-squirts. The latter are primitive members of the Chordate group which includes the vertebrates. Like the embryo of man, they possess during their larval period a chorda or cartilaginous spine. At first they are free swimming but later in life many of their organs degenerate and they become fitted to a stationary mode of life. [*See Reprint.*]

Wharf_Pile
Group

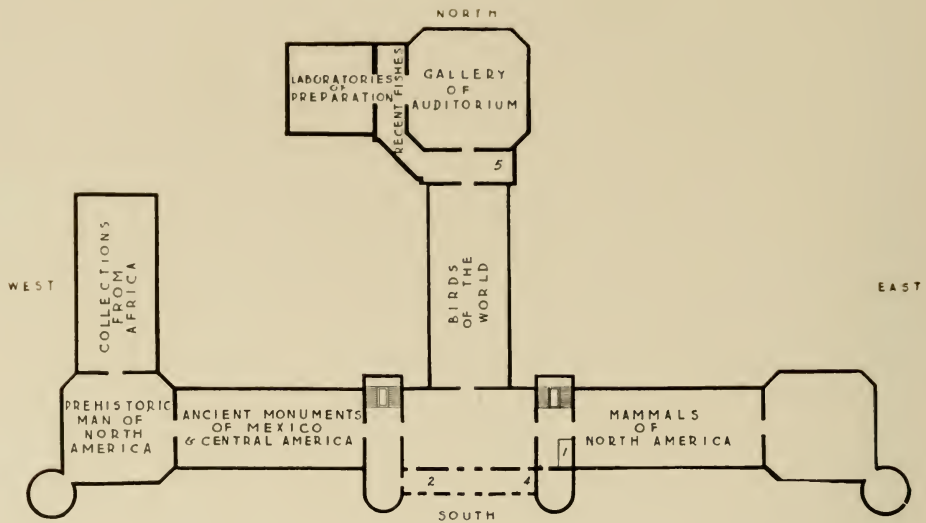
Other exhibits illustrate certain facts made clear by Darwin. On the right and left of the entrance variation under domestication is illustrated by dogs, pigeons, and domesticated fowls, the wild species from which they have been derived being shown in company with some of the more striking breeds derived from them.

Variation
under
Domestication

The struggle for existence is portrayed by the meadow mouse, surrounded by its many enemies and yet continuing to maintain an existence by virtue of its great birth rate.

Struggle for
Existence

[*Return to the elevators.*]



1. Elevators

SECOND FLOOR

SOUTH PAVILION

This hall illustrates a phase of Museum progress, the temporary disorder that precedes an ultimate change for the better. At present the hall contains a mixed assemblage of animals brought hither from other halls in process of re-arrangement; later it is hoped that it will contain a series of groups of birds from various parts of the world.

The Asiatic elephant is the famous "Tip" brought to this country in 1881, and for seven years one of the attractions of Forepaugh's circus. He was given to the City of New York by Mr. Forepaugh and lived in the Central Park Menagerie until 1894, when because of his treacherous disposition it was found necessary to kill him. He is said to have caused the death of several of his keepers, and was twenty-three years old when killed.

Here, awaiting the construction of a new wing is exhibited the collection of reptiles and amphibians. Because of the difficulty of preserving the natural covering of many of these animals they are usually exhibited in jars of alcohol. In the specimens on exhibition here, the perishable parts have been cast in wax from

life; for example in the star tortoise the original "shells" of the specimens are used, while the head, neck and legs are restored in wax. The mounting not only brings out the principal features of the species exhibited, but in many instances illustrates also some distinctive habit of the animals; for instance the common newt, one of the salamanders, is represented by a series of five life-size casts showing the process of shedding the skin; Pickering's hyla or the "spring peeper" is shown with vocal sacs inflated; the poisonous bushmaster is represented with its eggs, and so on.

The classification of these animals is shown in the upright cases; the groups in the center of the hall represent various reptiles as they appear in their natural haunts. They include the tuberculated iguana, the water moccasin, the diamond-backed rattlesnake, the Texas rattlesnake, the copperhead, the Gila monster, the pine snake, the box tortoise and the common painted turtle.

One of the most interesting of the groups is a jungle scene in India showing a water monitor, which is the largest of living lizards, the poisonous Russell's viper and the deadly spectacled cobra, the last with hood distended and body poised ready to strike. The cobra is said to be the cause of a large proportion of the 20,000 deaths which annually occur in India from snake bite. Examine carefully the group of the copperhead snake or "red-eye," one of the two species of poisonous snakes to be found in the vicinity of New York and also the group contrasting the harmless water snake with the poisonous water moccasin of southern cypress swamps. Two groups are devoted to rattlesnakes, which are easily recognized by the string of rattles at the end of the tail, by means of which they give warning before they strike. There are comparatively few species of poisonous snakes in the United States, about sixteen in all, comprising rattlesnakes, the moccasin, copperhead and two kinds of coral snake. All other species are harmless and in spite of the almost universal prejudice against them, are a very useful ally of man since they live chiefly on rats, mice and insects injurious to crops.

Entering the darkened gallery nearby, we find a series of four large groups which show what can be done in reproducing reptiles and amphibians in wax, making them seem alive and in action. The groups reproduce accurately also the natural haunts of the animals and with a beauty of composition, color and lighting which gives them decided art value. As to educational value, the reptile groups give to the children of New York City (nearly a million in number) opportunities which they might not otherwise have to see "the country," to get acquainted with animals in which they are always peculiarly interested, and to learn more about them in a half hour's observation than they could discover in years of study in the field—thus forming the basis for both interest and trained observation when opportunity for rural life may come to them later.



LOWER CALIFORNIA LIZARD GROUP

Showing the characteristic animal and plant life of one of the small desert islands off the coast of Lower California. The material for this group was collected by the "Albatross" Expedition of 1912 under Dr. C. H. Townsend

The giant salamander or hellbender best known in the streams of western Pennsylvania has its breeding season in autumn. [The scene shows blue asters and ripening grapes along the river.] Note that the hellbenders are wholly aquatic, no one of them being shown even partially out of water. The river is represented as flowing directly toward the observer to expose the nests and eggs which are under the rocks on the down stream side out of the current. At each nest a salamander (the male) is on guard over the eggs, and there are young salamanders one year old and two years old. Also various habits of the salamanders are shown, for instance, one is molting its skin, and others are eating crayfish caught from the rocks, or small fish. The animals of the giant salamander group are cast from the salamanders themselves, soft, jelly-like animals when taken out of water and which therefore had to be posed under oil so that their natural form would be kept while the plaster molds were being made.

The scene is a typical lily pond and this giant of North American amphibians is shown living both under the water and above on the land. The group illustrates the changes from the tadpole to the adult frog and shows many of the activities of the frog — its molting, swimming, breathing under water and in air, croaking and “lying low” before an enemy; also food habits in relation to small mammals, to birds, snakes, insects, small fish and turtles. The plant life of the group affords study of ecological arrangement from the delicate under-water forms, through the floating duckweed and near-shore water lilies and pickerel weeds to water-loving shrubs such as willow, swamp alder and white azalea. The group has a transparent background, the lights in front balanced by other lights behind the painted canvas.

The lizard group pictures a Lower California island. The brilliant hot sunshine, the sand, cacti and volcanic rock with the various kinds of lizards fitted to endure desert life make a striking contrast with adjoining groups. The larger specimens of the group, the iguanas and chuckwallas as well as the horned toads are mounted skins. The smaller specimens, such as the zebra-tails (at the center of the group) and collared lizards (running at rear left), are wax casts. The group had an interesting method of construction. All the ground work, the rocky slopes enclosing sandy gulleys leading down to the sea, was modeled life size in clay and then cast as a whole in plaster, so that the completion of the group meant merely the addition of plants and animals as planned and the final perfecting of all with color, papier-mâché and wax.

The toad group might well be given some more descriptive name. It presents a New England scene in early May and seems the personification of spring, filled with the exuberance of new life and suggesting everywhere motion and sound. Birds are just at the

moment of flitting; toads and "tree toads" are calling, their resonating throat pouches looking like great bubbles. The colors of May are soft yet brilliant in the new leaves of oak and maple, hornbeam, shadbush and tall blueberry, and everywhere can be seen the gleam of water drops from a recent rainfall. Stand far back at the extreme right and observe the group; also at the left, and note how the foreground leads into and is carried on by the background. It is as though we could walk far into the woods that stretch before us shining in the sun. The group shows the following species together with eggs and larvæ as they are in early May: two species of toads, the American at the left and Fowler's at the right; three kinds of frogs, the spotted pickerel frogs, the green frogs and the little brown wood frogs; two kinds of tree frogs, the spring peeper at the left, the common "tree toad" at the right; two of salamanders, spotted amblystomas and American newts, besides some snakes and turtles common at this season. Two of the most frequent questions asked by those who visit the country and are interested in its small animal life are "What is the difference between a toad and a frog?" and "How can I tell frog's eggs from toad's eggs and from salamander's eggs?" These questions are answered definitely by the group, which is the first attempt to reproduce in permanent form the gelatinous egg masses and developing tadpoles at different stages. The plant life is typical of early May in New England. A wild apple tree is in blossom over a tumble-down stone wall. Wild flowers are so perfectly made that although set close before the eyes of the observer and in the most brilliant light, yet it is difficult to see that they are not real — yellow marsh marigolds, blue violets, Jack-in-the-pulpits, white anemones, star flowers and trilliums and red columbines. The group emphasizes in its fine detailed technique the expert character of the Museum's artists working in wax and glass.



THE AMERICAN ROBIN — ONE OF THE GROUPS OF LOCAL BIRDS

WEST CORRIDOR

LOCAL BIRDS

Adjoining the *South Pavilion* is the *West Corridor* which contains the collections of local birds.

In this room are specimens of all the varieties of birds which have been known to occur within fifty miles of New York City. As far as possible each species is shown in all its different plumages. In the wall cases nearest the entrance on both sides is the *General Collection* of all birds likely to be seen within this area, arranged according to the current American system of classification. Near the windows are cases containing the *Seasonal Collection*, one section containing the permanent residents while others have their contents changed each month so that they may show always the birds present at the time. In another section are the stragglers from other parts of the country and from other countries which have been taken within our limits.

Besides the table case containing the eggs (often with the nest) of species known to nest within fifty miles of the City and the collection of



HALL OF MEXICAN AND CENTRAL AMERICAN ARCHAEOLOGY

A collection comprising many casts of ancient stelae, or monuments carved from volcanic stone, and probably commemorating events in pre-Columbian times; also codices or chartlike books that later replaced the stela as records; casts of sacrificial stones; pottery and figures worked in clay; and many objects in jade, gold, and copper

photographs showing many of them in nature, there are down the middle of the room a series of groups of local breeding birds with their nests. These the forerunners of our "Habitat Groups," were the first of their kind made for the Museum. [See *Guide Leaflet* No. 22.]

SOUTHWEST WING

ANCIENT MONUMENTS OF MEXICO AND CENTRAL AMERICA

Continuing west, past the collection of local birds we enter the *Southwest Wing*, devoted to ancient monuments of Mexico and Central America. The reproductions illustrate chiefly the sculptures of the Maya and Nahua Indians made before the time of Columbus and are the gift of the Duke of Loubat.

At the left of the entrance are cases of pottery, jade and heavy stone work from Panama, Costa Rica and Nicaragua. For skill in free hand modeling and painting the pottery ranks high.

Opposite this exhibit are examples of original stone sculptures of the Maya, mostly excavated at Copan in western Honduras.

Maya Art Beautiful pottery and finely wrought jades are also shown from other sites. The Maya were perhaps the most highly civilized people in the New World. They built many cities of stone and erected many fine pillar-like sculptures which are called stelæ. The subject-matter on these monuments deals with priest-like beings who carry serpents and other ceremonial objects in their hands. There are also long hieroglyphic inscriptions containing dates in the wonderful Maya calendar. Maya history contains two brilliant periods. That of the south, extending from 160 A.D. to 600 A.D., was chiefly remarkable for its sculptures. The principal cities were Copan, Quirigua, Tikal, Yaxchilan and Palenque. The second period fell between 950 A.D., and 1250 A.D., and centered in northern Yucatan. The chief cities were Chichen Itza, Uxmal and Labna, and the finest works of art were architectural.

Passing to the end of the hall and then returning toward the east entrance, we see, on either side of the aisle, reproductions of the stelæ and altars of Copan arranged in order from the oldest and crudest forms to the latest and finest examples of carving, covering a stretch of nearly 300 years. The early stelæ have hieroglyphs carved in very low relief and with sharp corners, while the hieroglyphs on the later monuments are cut deeper and in more rounded relief. In the early stelæ human figures are carved in an awkward block-like manner, with protruding eyes and angular limbs. The two lofty stelæ in the center are from Quirigua and date from about 550 A.D. From this city also comes



THE AZTEC GODDESS OF THE EARTH

The famous statue of the Aztec Goddess of the Earth called *Coatlicue*, "the Serpent-skirted One," is a striking example of barbaric imagination. It was found in Mexico City near the Cathedral in the year 1791. It doubtless occupied an important place in the great ceremonial center of Tenochtitlan, the Aztec capital, and probably dates from the last quarter of the 15th century.

The head, which is the same on front and back, is formed by two repulsive serpent heads meeting face to face. The feet are furnished with claws, but the arms, which are doubled up with the elbows close to the sides, end each in a serpent's head. The skirt is a writhing mass of braided rattlesnakes. The creature wears about the neck and hanging down over the breast a necklace of human hands and hearts with a death's head pendant in the center. Coatlicue seems to have been regarded as a very old woman and as the mother of the Aztec gods.

the elaborately sculptured boulder that may have served as an altar. It represents a two-headed monster overlaid with several layers of ornament. Sculpture from Palenque and other cities is also shown.

The second or architectural period of Maya art is exemplified in the copy of the painted sculptures of the Temple of the Jaguars at Chichen Itza. Here are shown warriors in procession who seem to be coming to worship a serpent god. Prayers are represented as coming from their lips. This sculpture shows strong evidence of Mexican influence in certain of its details.

Next in order is the Nahua culture represented in the alcove cases by ancient pottery, musical instruments, copper objects and ornaments of obsidian and jade. One case contains facsimile reproductions of native books, or codices, which were painted free hand on strips of deerskin, paper or cloth. Several original documents are also exhibited. The Spaniards, in their zeal to destroy the native religion, burned hundreds of these books which recorded ceremonial rites and historical events by means of pictures and hieroglyphs. The Nahua culture extended through many centuries leaving remains, such as pottery, which are found deposited in distinct layers, one above the other. In the valley of Mexico there are three so-called culture horizons, the last being that of the Aztecs. There is no good reason to believe that any connection in art or religion existed between Mexico and any part of the Old World.

The Aztecs founded their capital city, called Tenochtitlan (Mexico City), in the year 1325, and had a short but brilliant history.

Before the arrival of Cortez, in 1519, they had reduced most of the provinces of central Mexico. The sacrificial stone, or Stone of Tizoc, is a record of some of their principal conquests made before 1487. The Calendar Stone is a graphic representation of the four prehistoric creations and destructions of the world as well as symbol of the sun and a record of the divisions of the year. The statue of Coatlicue, the mother of the two principal Aztec gods, is a curious figure, made up of serpents. All three sculptures were originally in the Great Temple enclosure and are now in the Mexican National Museum.

The funeral urns of this region are highly conventionalized figures. A cruciform tomb at Guiaroo, near the ruins of Mitla, is shown by a model at this end of the room.



THE HEAD OF THE AZTEC EARTH GODDESS

Head of a rattlesnake, rattlesnake as shown in Aztec carvings, outline of head of Earth Goddess. In the real snake the fangs do not show unless the mouth is open. In the Aztec figure two fangs are shown, one of these being a reserve fang that comes forward to take the place of the fang in use should that be lost.

SOUTHWEST PAVILION

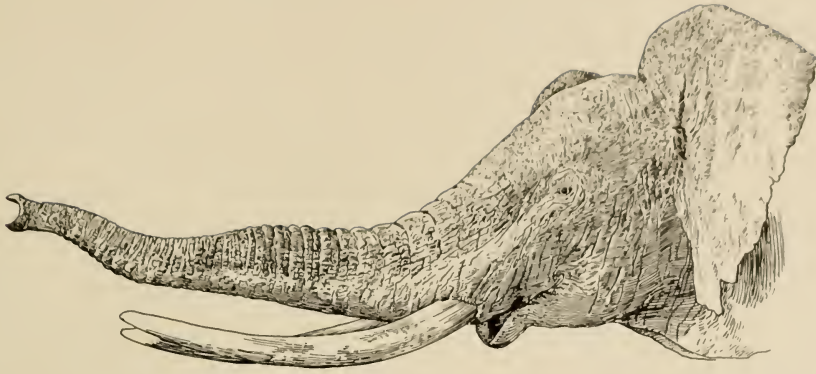
PREHISTORIC MAN OF NORTH AMERICA

Continuing west we pass into the *Southwest Pavilion* likewise given over to archæology, in this instance that of North America. Here are examples of ancient pottery, arrow-heads, stone axes and other implements of stone and bone, mostly from burial mounds. The most important of these are the rude implements and fragments of human bones from the Trenton gravels, as these are the oldest indubitable evidences of man on this continent. Notice that the arrangement of the hall is geographical and by states. In addition there is a special exhibit of Mississippi Valley pottery in the wall cases and the Douglass type specimen series in the cases to the left near the center.

In the tower room adjoining are the stone implements and rude carvings of the primitive men who inhabited the caves of Southern Europe at a time when England was a peninsula, the north of Europe buried deep under the ice of a glacial epoch and the reindeer and the hairy mammoth roamed through Southern France.

Around the room are copies of paintings — for primitive man was an artist as well as a hunter — on the walls of the caves of Altamira, Font de Gaume, and others, showing the bison, wrongly called aurochs, the mammoth and the horse of that day, the contemporaries of the *Neanderthal* man.

In the table cases are selected series of stone and bone implements arranged according to the accepted chronological periods of paleolithic times. In an adjoining case may be seen casts of the Heidelberg jaw and other ancient skeletal remains.



WEST WING

COLLECTIONS FROM AFRICA

Opening to the north from this hall of North American Archaeology is the African Hall. This differs from other halls in containing besides ethnographical specimens a number of characteristic African mammals. The future extension of the Museum will provide room for groups of African mammals, including elephants. The installation is geographical, i. e., as the visitor proceeds through the hall from south to north he meets the tribes that would be found in passing from south to north in Africa, and the west coast is represented along the west wall, the east coast along the east wall.

There are three aboriginal races in Africa: the Bushmen, the Hottentot, and the Negroes. In the north the Negroes have been greatly influenced by Hamitic and Semitic immigrants and become mixed with them.

At the south end of the Hall the wall is decorated with reproductions of cave-paintings made by the Bushmen, the most ancient and primitive of African natives. These works of art are remarkable for their realism, and should be compared with the reproductions of old European cave paintings in the tower of the adjoining hall.

Nothing is more characteristic of the Negro culture, to which the rest of the Hall is devoted, than the art of smelting iron and fashioning iron tools. The process used by the African blacksmith is illustrated in a group near the entrance, on the west side, and the finished products, such as knives, axes, and spears, are amply shown throughout the hall. The knowledge of the iron technique distinguishes the Negro culturally from the American Indian, the Oceanian, and the Australian.

All the Negroes cultivate the soil, the women doing the actual tilling, while the men are hunters and, among pastoral tribes, herders. Clothing is either of skin, bark cloth, or loom-woven plant fiber. The manufacture

of a skin cloak is illustrated by one of the figures in the group to the left of the entrance; bark cloths from Uganda are shown in the northeastern section of the Hall; while looms and the completed garments are shown in the large central rectangle devoted to Congo ethnology. The most beautiful of the last-mentioned products are the "pile cloths" of the Bakuba, woven by the men and supplied with decorative patterns by the women. Very fine wooden goblets and other carvings bear witness to the high artistic sense of the African natives, who also excel other primitive races in their love of music, which is shown by the variety of their musical instruments.

A unique art is illustrated in the Benin case in the northwestern section of the Hall, where the visitor will see bronze and brass castings made by a process similar to that used in Europe in the Renaissance period. It is doubtful to what extent the art may be considered native.

The religious beliefs of the natives are illustrated by numerous fetiches and charms, believed to give security in battle or to avert evils. Ceremonial masks are shown, which were worn by the native medicinemen.

[Return to Central Pavilion.]

SOUTH CENTRAL WING

BIRDS OF THE WORLD

Going north we enter the hall containing the general collection of birds.

Birds of the World

In the first four main cases on the right the 13,000 known species are represented by typical examples of the principal groups arranged according to what is believed to be their natural relationships. The series begins with the Ostriches, the "lowest" birds (that is, those which seem to have changed least from their reptilian ancestors) and goes up to those which show the highest type of development, the Singing Perching Birds such as our Thrushes and Finches. The remaining cases on the right wall and all of those on the left show the geographical distribution of the bird fauna of the world. The specimens are grouped according to their great faunal regions, the South American Temperate, American Tropical, North American Temperate, Arctic Eurasian, Indo-Malay, African and Australian realms. These cases in connection with the accompanying maps give opportunity for a comparative study of the birds of the different parts of the world. In each region, as in the Synoptic Collection, the birds are arranged in their natural groups to the best of our present knowledge.

Down the middle of the hall near the entrance are several cases containing birds which have become extinct or nearly so. The **Extinct Birds** Labrador Duck, once a common visitor to our Long Island shores, became extinct for no known reason. The Great Auk and the



THE PTARMIGAN IN WINTER

One of a series of four small groups showing this bird's seasonal changes of color as brought about by molting and feather growth

Dodo were flightless species which bred in great numbers on small islands and were easily and quickly killed off by men. The Passenger Pigeon of North America lived by the million in such dense flocks that vast numbers were slaughtered with ease, so that now (1914) the *only individual left alive* is an aged female in the Cincinnati Zoölogical Gardens.* The Heath Hen formerly had a good range on our Atlantic seaboard, but as a game bird, it was so continually persecuted, in and out of the breeding season, that it is now extinct except for a few which survive under protection on the island of Martha's Vineyard. Others of our splendid game birds, such as the Trumpeter Swan and Eskimo Curlew, are nearly, if not quite gone, and more like the Wood Duck and Wild Turkey, will soon follow them if a reasonable close season and limited bag be not rigidly enforced. Still others — the beautiful Egrets and the Grebes, for example — have already gone far on the same road owing to the great demand for their plumage for millinery purposes.

The widely different plumages (varying with age, sex, season, or all three) often worn by one species will be found illustrated in the Ptarmigan case and in the case containing Orchard Orioles, Snow Buntings, Scarlet Tanagers and Bobolinks. The relation-

General Topics

* Died September 1, 1914.



LABRADOR DUCKS, NOW EXTINCT
From the Group in the American Museum

ship between structure and habits, the many forms of bill, feet, wings, tail, etc., and the different ways of using them are illustrated in other cases, particularly by one showing the feeding habits of some birds.

In the alcoves to the right the first egg case contains the Synoptic Eggs Collection of Eggs which shows the variation in the number in a set, size, shell texture, markings, shape, etc., and tells something of the laws governing these things. The succeeding cases contain the general exhibition collection of nests and eggs, principally those of North American and of European birds.

At the north end of the hall is a nearly complete collection of the Birds of Paradise, presented by Mrs. Frank K. Sturgis. This family of birds is confined to New Guinea, Australia and some neighboring islands. Their feet and bills show their close relationship to the Crows and Jays, which they resemble in nesting habits as well. Their chief characteristic is of course their gorgeous plumes, wonderful as well in variety of form and position as in beauty. For these plumes the birds are still being killed in such large numbers that unless the demand for them soon ceases all the finer species will be exterminated, as the Great Bird of Paradise is believed to be already. More Birds of Paradise have been sold at a single London auction (23,000 in two sales) than are contained in all the museums of the world.

Also in this hall are a number of groups of local and other birds which are placed here only temporarily. In fact, much of the arrangement of the hall will be changed as soon as circumstances permit.

Suspended from the ceiling is the skeleton of a Finback Whale, sixty-two feet in length.

CORRIDOR OF CENTRAL PAVILION

RECENT FISHES

The doorway at the north end of the hall of the birds of the world leading to the rear of the bird of paradise case opens into the gallery of the *Auditorium* and to the corridor devoted to the general collection of recent fishes.

The exhibit includes typical examples of the various groups of back-boned animals popularly comprised in the term "fishes" and is arranged in progressive order. The visitor should first examine the case of hag-



A PORTION OF THE PADDLEFISH GROUP

fishes and lampreys facing the large window. These rank among the most primitive "fishes." They are without scales, without true teeth, without paired limbs, and their backbone consists of but a rod of cartilage.

**Hag-fishes
and
Lampreys**

One of the models shows the way in which a newly caught hag-fish secretes slime, forming around it a great mass of jelly. In the same case are lampreys, and one of them is represented attached to a fish, which it fatally wounds.

The nest-building habit of lampreys is illustrated in a neighboring floor case: here the spawners are preparing a pit-like nest and carrying away stones, which they seize with their sucker-like mouths.



THE BOWFIN GROUP

To illustrate the nesting habits of the bowfin, or mudfish (*Amia calva*). At the left the male and female fishes are seen over a nest; at the right a male is standing guard over the eggs. The materials for the group were collected at Fowler Lake, Oconomowoc, Wisconsin, in May, 1912

The visitor should next inspect the cases of sharks which are situated near the entrance hall on the south side. These include various forms of sharks and rays, selected as typical members of this ancient group — for the sharks have numerous characters which put them in the ancestral line of all other groups of fishes.

Next to be visited are the silver sharks or *Chimaroids*, which are exhibited by the side of the lamprey case. They are now known to be highly modified sharks: their scales have failed to develop, and their heavy "teeth" appear to represent many teeth fused together. These fishes are now very rare and, with few exceptions, occur in the deep sea. The present models show the characteristic forms.

The adjacent case (at the left) pictures the three types of surviving lungfishes, and the models are arranged to indicate the life habits of these interesting forms. Thus, they are shown going to the surface of the water to breathe; and their poses indicate that they use their paired fins just as a salamander uses its arms and legs. In fact there is reason to believe that the land-living vertebrates are descended from forms closely related to lungfishes. One sees in this case also a "cocoon," in which the African lungfish passes the months when the streams are dried up and during which time it breathes only by its lungs.

One now passes into the north aisle of the fish gallery and stops at the first case on the left. Here appear all types of existing Ganoids. These are fishes that represent, as it were, a half-way station between lungfishes and sharks on the one hand, and the great tribe of bony fishes on the other — such as perches, basses, cod, etc. In this case one sees gar pikes, sturgeons, the mudfish (*Amia*), together with the African *Bichir*, a curious Ganoid encased in bony scales and retaining structures which bring it close to the ancestral sharks. A further glimpse of the Ganoids may now be had by returning near the entrance of the fish hall and viewing the spoonbill sturgeon (*paddlefish*) group, in which a number of these eccentric fishes are shown side by side with gar pikes and other characteristic forms from the Lower Mississippi. This group was secured through the Dodge Fund.

Returning then to the north wing of the gallery the remaining cases give characteristic examples of the various groups of modern "bony fishes," or Teleosts. There are twenty-six cases of them in all, but they offer little space in which to illustrate the 10,500 species. For these are the fishes which are dominant in the present age, contributing over nine-tenths of all existing forms and including nearly all food and game fishes, such as bass, cod, eel and herring. One of the cases of the Teleosts exhibits the grotesque fishes from deep water, in which they occur to the surprising depth of over 3,000 fathoms, or more than $3\frac{1}{2}$ miles. They are usually soft in sub-



LUMINOUS DEEP-SEA FISHES

This group represents some of the types of fishes living in the profound depths of the sea, half a mile or more from the surface. The fishes are models made of wax, glass and celluloid, and most of them are several times the natural size

stance, with huge heads and dwarfish bodies, and are often provided with illuminating organs like little electric bulbs, which can be "shunted off or on" by the fish, and enable the fishes either to see their neighbors or to attract their prey. A group representing a number of these fishes as they are supposed to appear in the gloom of the profound depths, lit up only by their luminous organs, is shown in an enclosure next to the Paddlefish Group mentioned above.

The cases should be examined in the order numbered (beginning with 14); and one may pass in review the catfishes, carps, eels, trout, salmon, pike, mullets, mackerel, basses, wrasses, drumfish, sculpins, cods, flatfishes and anglers.

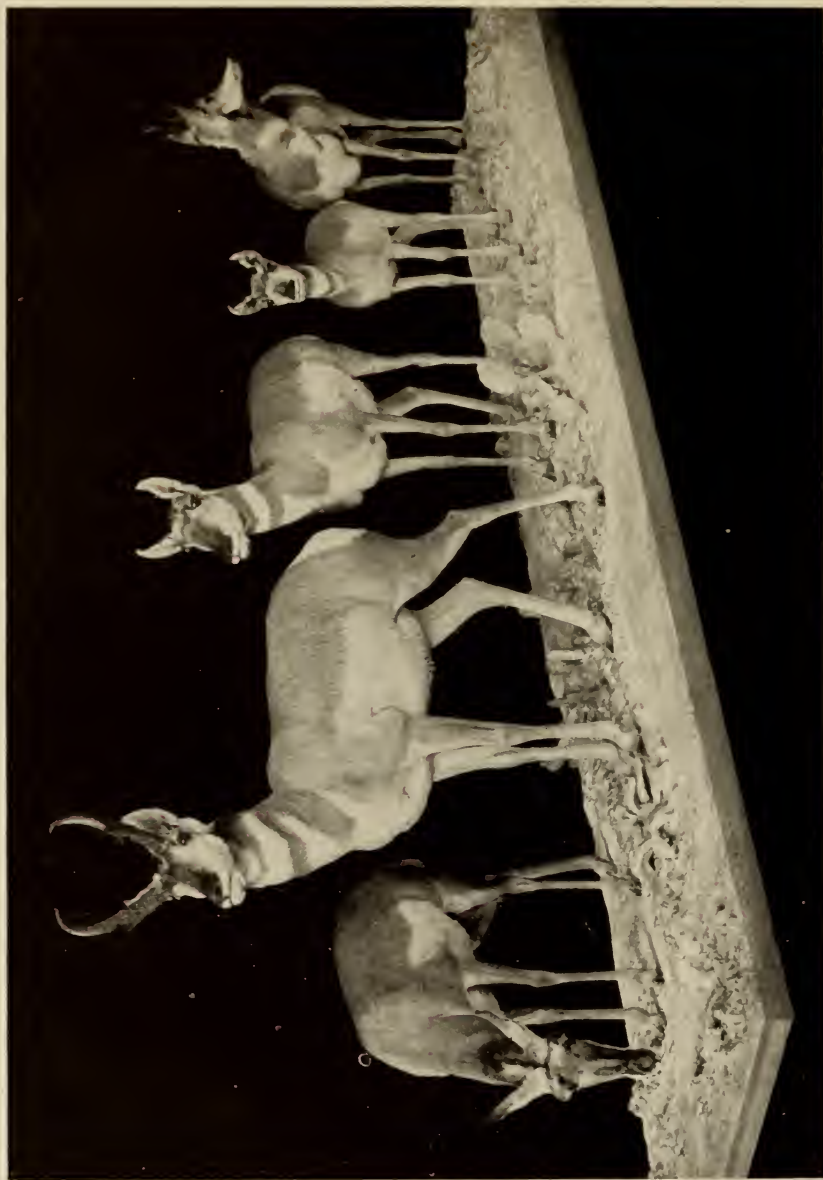
Before the visitor has completed his review of the gallery, he should examine the three wall-cases which explain the characteristic structures of fishes of different groups, and the way in which the groups are related to one another. In one of these wall-cases various kinds of fishes have been arranged in a genealogical tree, and the lines and labels give an idea of their evolution.

Among the conspicuous exhibits of the gallery one notices a sun-fish *Ocean Sunfish* (*Mola*), which is the largest example of which we have any exact record (it is 10 ft. 2 in. from tip to tip); also a 12 ft. 9 in. thresher shark, and a gar pike, 7 ft. 4 in. long.

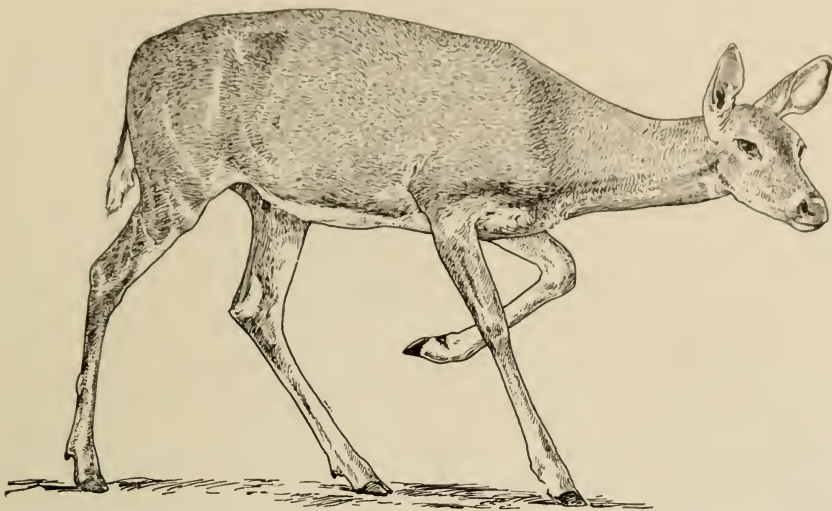
In the window are groups showing the shovel-nosed sturgeon, and the spawning habits of the bowfin and of the slender-nosed garpike.

An exhibit of fossil fishes is to be found on the fourth floor.

[Return to the elevators.]



A GROUP OF PRONGHORN ANTELOPE SHOWING THE MANNER IN WHICH THEY WANDER ACROSS THE PLAINS
This animal is peculiar to North America, and is the only hollow-horned ruminant in which the horn sheaths are shed yearly



THE VIRGINIA DEER — A CHARACTERISTIC NORTH AMERICAN MAMMAL

Line drawing from the mounted specimen. This Virginia doe stands as the first example in the Museum of the new methods of animal sculpture as opposed to the old taxidermy. It was mounted and presented by Carl E. Akeley in 1902

SOUTHEAST WING

MAMMALS OF NORTH AMERICA

Continuing east beyond the elevator corridor, we enter the hall containing specimens of North American mammals, the first to catch the eye being the giant moose of Alaska. In the cases on the west wall are groups illustrating the mammals found within fifty miles of New York City. The first of these groups shows the opossum, the sole representative in the United States of the marsupial or pouched mammals. With what appear to be the head and ears of a pig and the prehensile tail of a monkey, with a strange pouch for the transportation of the young, and with proverbial cunning and remarkable tenacity of life, the opossum is one of the quaintest and most interesting of North American mammals. This is the animal so famous in the negro songs of the South.

Next in order is the raccoon, more commonly known as the "coon." It is nocturnal in habit and makes its nest in hollow trees. Two species of fox are shown, the red fox and the gray fox, both of which are justly famous for their sly cunning.



ALASKAN FUR SEALS

The common skunk is a very useful although greatly abused animal. While it occasionally destroys poultry and other birds, its principal food consists of injurious insects and field mice. Its defensive weapon is an excessively fetid fluid secreted by a pair of glands situated near the base of the tail. It has the ability to eject this fluid



THE WEASEL GROUP

One of the groups representing the small mammals found within fifty miles of New York City. The others of the series show opossum, raccoon, red and gray foxes, skunk, mink, muskrat, woodchuck, rabbits and squirrels. The list includes some "fur-bearing" species; weasel fur is often used instead of ermine

to a considerable distance. Its skin makes a valuable fur known as "Alaskan sable."

Mink and Weasel

Two other fur-bearing animals shown are the mink and the weasel, the latter in both its summer dress of dull brown and its winter coat of white. Weasel fur is often used in place of ermine.

Muskrat

Another fur-bearing animal shown is the muskrat. In the group are seen its summer home, usually a burrow in the bank of a stream or pond, and its winter mound, constructed of swamp grass and roots mixed with mud. Muskrats are extensively trapped for their fur and in 1913 no less than 4,500,000 were sold in London.



THE AMERICAN BEAVER

This shows the work and home life of the beaver. The old beavers are cutting trees for food and for building dams and houses. In the foreground a house with part torn away to show the little beavers within

The woodchuck or ground hog is a vegetable feeder but does very little harm to crops. It hibernates for a large part of the year usually from September to April. The old legend says that the ground hog comes out of his hole on the second of February and if it is bright and he sees his shadow, he goes back into his hole for six weeks longer and we may expect more cold weather. Other groups represent the varying hare and the common species of squirrels.

In the central section of the hall is a group of moose. It represents an early autumn scene in a second growth forest in New Brunswick, and illustrates one of the favorite feeding grounds of the moose.



BISON COW AND CALF

The big game of North America is described in *Guide Leaflet No. 5, North American Ruminants*

The buffalo group gives a typical bit of the prairie traversed by buffalo trails, while the members of the herd represent different stages of growth of the buffalo. This is the animal which formerly roamed in countless numbers over the western plains but which is now reduced to a few insignificant herds.

On the north side of the hall is a pair of the huge brown bears of Alaska, a family of fur seals from the Pribilof Islands and a family of Rocky Mountain Goats.

At the end of the hall is a group of Roosevelt Elk found in the Coast Range from British Columbia to northern California. Once abundant, they have become much reduced in numbers, though an effort is now being made to preserve them.

Near by is a group of that interesting animal, the Beaver, perhaps the most important of North American mammals and one intimately connected with the early history and exploration of this country

On the south side of the hall are displayed the cloven-hoofed animals of North America. These include sheep, musk ox, caribou, Antelope Group collared peccary and various species of deer. In one of the cases is a group of antelope showing the manner in which they wander across the plains.

Here too are, for the time being, shown the mammals of the polar regions, placed in the North American hall in order that the *Southeast Pavilion*, which once harbored them, may be used as a workroom for the preparation of a group of African Elephants and other mammals from the dark continent. Though the room is closed to the public yet much of the interesting work of preparing these groups may be seen from the gallery above, and later on visitors will be admitted on certain days.

Grant's Caribou Group Grant's caribou inhabit the barren ground of the extreme western end of the Alaskan peninsula. The type specimen of this species is in the Museum.

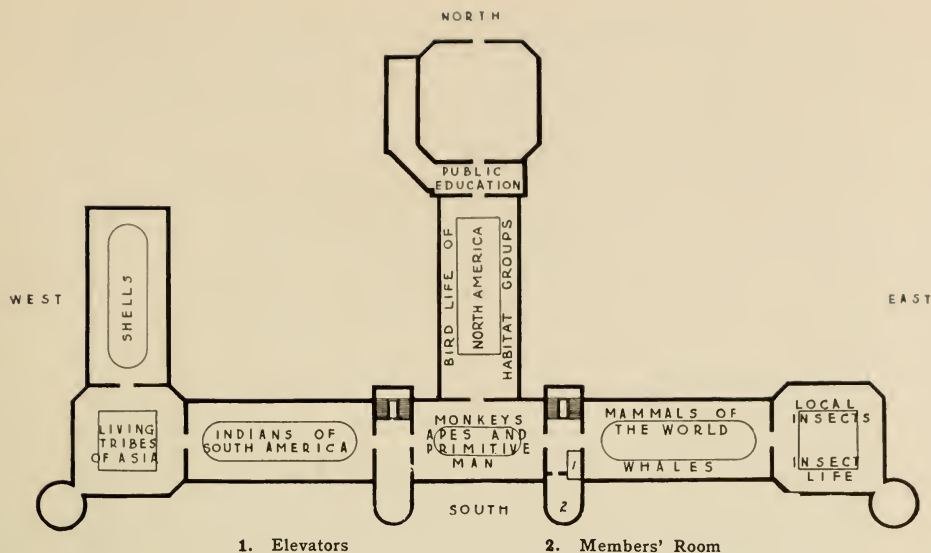
Near by is a group of the Atlantic walrus. These huge mammals are relatives of the seals, inhabit the waters of the far north and are still fairly abundant along the shores of Greenland. Walrus Group The seal and walrus are the animals which play such an important part in the life of the Eskimo. From these animals come the principal food supply, skins for clothing, for fishing and hunting gear, boat covers, and harnesses for dog teams; from bones and tusks are made knives, bows, harpoons, and other hunting and cooking utensils.

The specimens in the musk ox group were collected for the Museum by Admiral Peary in 1896. Musk oxen inhabit the snow-covered wastes of the Arctic barrens, living mainly upon willow leaves, dug up from under the snow.

Note the various devices in the way of labels introduced to make the exhibits interesting and instructive. At the entrance attention is called to the principal causes influencing the distribution of mammals; on many of the labels are maps showing the range of the species shown, and near the group of Mountain Sheep is a label including a map and miniature models illustrating the species of North American mountain sheep and their range.

SOUTHEAST PAVILION

Being used as a workroom; see paragraph above.



THIRD FLOOR EAST CORRIDOR

Members' Room To the left of the elevators is a room set apart for the use of honorary or subscribing members of the Museum, where they may leave their wraps, rest, write letters or meet their friends. Near by is a bronze tablet in memory of Jonathan Thorne, whose bequest provides for lectures and objects for the instruction of the blind.

Thorne Tablet

SOUTH PAVILION

MONKEYS, APES, RODENTS, BATS

This is one of the halls in course of rearrangement and, in the final plan, is intended to include primitive man as well as the other members of the order Primates.

The family of orang-utans, on the south side, was one of the first groups of large animals to be mounted in this country, and was considered a daring innovation. Near by are examples of the gorilla, the largest and most powerful of the great apes and the chimpanzee, which is the most like man in proportions and structure. "Mr. Crowley," one of the few full grown apes that have endured captivity, lived for some time in the Central Park Zoo. Skeletons of man and the large apes illustrate the similarities and difference in structures between them.

The bats, the only mammals that really fly, and rodents, the most numerous and widely distributed of mammals are provisionally placed in this hall pending other arrangements.



DUCK HAWK ON PALISADES OF THE HUDSON

Realism and artistic effect have been achieved in the "Habitat Bird Groups," and they present vividly many stories of adaptation to environment

The fruit bats, often known as flying foxes, the largest members of the order and found only in the warmer parts of the Old World, are represented by a small portion of a colony from Calapan, Philippine Islands. Such a colony may number several thousands, and be very destructive to bananas and other fruits.

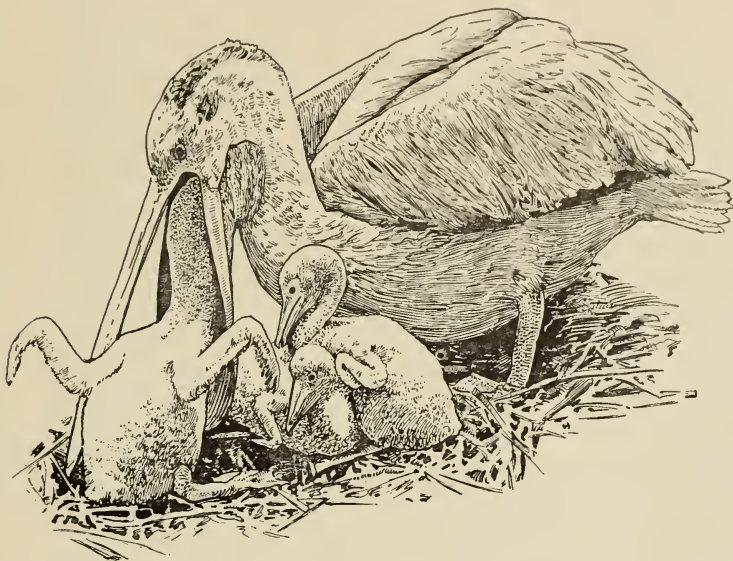
Suspended from the ceiling in the center of the hall is the skeleton of a medium sized North Atlantic right whale, a species once common on our coast, but now all but exterminated in the North Atlantic.

SOUTH CENTRAL WING

BIRD GROUPS

Here are the "Habitat Groups" of North American Birds. This unique series of groups shows the habits of some typical American birds in their natural haunts. The groups have been prepared under the immediate direction of Frank M. Chapman, Curator of Ornithology, who collected most of the specimens and made practically all of the field studies necessary for their reproduction. In the course of this collecting, he traveled more than 60,000 miles. The backgrounds are reproductions of specific localities, painted from sketches made by the artist who usually accompanied the naturalists when the field studies for the groups were made. Practically all

sections of the country are represented, thus the series not only depicts characteristic bird life of North America but characteristic American scenery as well. The backgrounds of the groups were painted by Bruce Horsfall, Charles J. Hittell, J. Hobart Nichols, Carl Rungius, W. B. Cox and Louis A. Fuertes. The foliage and flowers were reproduced in the Museum laboratories from material collected in the localities represented. Each group is fully described in the label attached to the case. [See *Guide Leaflets* No. 28 and No. 22.] Beginning with the case at the right of the entrance and passing on to the right around the hall, we find the groups arranged in the following sequence:



White pelican from Klamath Lake Group, Oregon. One young bird is illustrating its amusing method of procuring food from its parent's throat

The distribution of birds, notwithstanding their powers of flight, is limited in great measure by climate. Thus in traveling from Panama north to Greenland there are zones of bird life corresponding to the zones of temperature. This condition is illustrated in the mountain of Orizaba in Mexico, where in traveling from the tropical jungle at its base to its snow clad peak the naturalist finds zones of life comparable with those to be found in traveling north on the continent. Thus the Orizaba group so far as the distribution of life is concerned is an epitome of all the groups in the hall.

Among our most beautiful and graceful shore birds are the terns and gulls, which (because of their plumage) have been so ceaselessly hunted and slaughtered for millinery purposes that now in their breeding places there are only hundreds where formerly there were thousands. The group represents a section of an island off the Virginia coast where the birds are now protected by law.

Orizaba
Group

Cobb's Island
Group



THE ORIZABA GROUP

The observer is looking across the valley of the Rio Blanca, over the tropical forest, to Mount Orizaba

The duck hawk may be found nesting on the Palisades of the Hudson almost within the limits of New York City. It builds

nests on the ledges of the towering cliffs. This hawk is a near relative of the falcon which was so much used for hunting in the Middle Ages.

In August and September the meadows and marshlands in the vicinity of Hackensack, New Jersey, are teeming with bird life. In the group

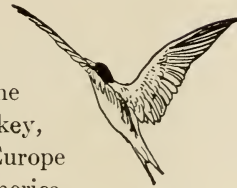
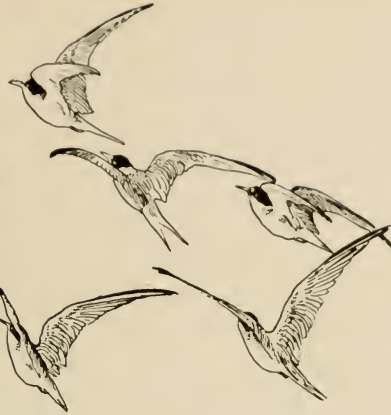
showing these Hackensack meadows are swallows preparing to migrate southward, bobolinks or rice birds in fall plumage, red-winged blackbirds, rails and the wood duck.

The wild turkey is a native of America and was once abundant in the wooded regions of the eastern portion of the United States, but is now very rare. It differs in color from the Mexican bird, the ancestor of our common barnyard turkey, which was introduced from Mexico into Europe

about 1530 and was brought by the colonists to America. (Reproduced from studies near Slaty Forks, West Virginia.)

The great blue heron usually nests in trees. The bird flies with its neck curved back on its body and because of this habit can readily be distinguished from the crane with which it is frequently confounded. (Reproduced from studies near St. Lucie, Florida.)

In the "bonnets" or yellow pond lily swamps with cypresses and cabbage palmettoes, the shy water turkey builds its nest. It receives the name "turkey" from its turkey-like tail and the title "snake-bird" from its habit of swimming with only the long slender neck above water. (Reproduced from studies near St. Lucie, Florida.)



Terns

Cobb's Island Group

Duck Hawk Group

Hackensack Meadow Group

Wild Turkey Group

Florida Great Blue Heron Group

Water Turkey or "Snake-bird" Group

The sandhill crane builds its nest of reeds in the water. Unlike the herons in this respect, it differs also in its manner of flight, always stretching its neck well out when on the wing. (Reproduced from studies on the Kissimmee Prairies of Florida.)

Sandhill Crane Group

Pelican Island on the Indian River of Florida has been made a reservation by the United States Government and these grotesque birds may now breed there undisturbed. The view shows a section of the island at the height of the nesting season. Notwithstanding the hundreds of young birds that are clamoring for food, observation has shown that the parent bird can pick out its own offspring with unfailing accuracy. (Reproduced from studies at Pelican Island, Florida.)

Brown Pelican Group

This beautiful bird has been brought to the verge of extinction in this country through the use of its "aigrette plumes" for millinery purposes, and is now confined to a few protected rookeries of the South. The birds have these plumes only during the nesting season, at which time the death of the parent means the starvation of the young. (Reproduced from studies in a rookery of South Carolina.)

Snowy Heron or Egret Group



A PORTION OF THE EGRET GROUP

As shown here the birds carry their plumes only during the nesting season; killing the parents means the slow starvation of the young

The turkey vulture or buzzard is one of the best known birds of the South where it performs a valuable service in acting as the scavenger of the streets. On this account it is protected by law and by public sentiment and has become both abun-

Turkey Vulture Group

dant and tame. (Reproduced from studies at Plummer Island in the Potomac River, near Washington.)

The California condor is the largest and one of the rarest of North American birds. It is not so heavy as the condor of the Andes but has a slightly greater spread of wing, eight and one-half to eleven feet. In the group the visitor is supposed to be standing in the interior of the cave where the bird has its nest and is looking down on the river of the cañon which is more than five thousand feet below. (Reproduced from studies in Piru Cañon, California.)

The foreground of the group shows a detail of the island that is painted in the background. The young birds are feeding and it will be noticed that one fledgeling is reaching well down the mother's throat after the predigested food. (Reproduced from studies at Monterey, California.)

Formerly this area was an arid place with a characteristic desert bird fauna. Now the ranchmen have irrigated the land and aquatic bird life abounds. This group is a good illustration of the influence of man on the bird life of a region.

In the breeding season the flamingos congregate in great numbers in their rookeries. There were estimated to be two thousand nests in this colony. The flamingos construct their nests by scooping up mud with their bills and packing it down by means of bills and feet. The nests are raised to a height of twelve or fourteen inches; this protects eggs and young from disasters due to high water. Only one egg is laid in the nest, and the young is born covered with down like a young duck and is fed by the mother on predigested food. The brilliant plumage of the adult is not acquired until the fifth or sixth moult. (Reproduced from studies in the Bahama Islands.)

In this group is shown a portion of a coral islet on which three thousand boobies and four hundred man-of-war birds were nesting, the former on the ground, the latter in the sea grape bushes. (Reproduced from studies in the Bahama Islands.)

The abundance of bird life in one of these rookeries is quite astounding. In this group are roseate spoonbills, snowy egrets, Florida American egrets, little blue herons, Louisiana herons, ibises, cormorants and water turkeys. Because of the great inaccessibility of this island it has been one of the last places to escape the depredations of the plume-hunter. (Reproduced from studies in the Everglades of Florida.)

The golden eagle is one of the most widely distributed of birds. In



A FLAMINGO COLONY IN THE BAHAMAS

A "city" of these birds is the most remarkable sight in the world of birds. The mud nests are raised from eight to fourteen inches, and thus protected during rise of water

North America it is now most common in the region from the Rockies to the Pacific coast, although it is found as far east as Maine. **Golden Eagle Group** Stories to the contrary notwithstanding, the eagle never attacks man even though the nest is approached.

Its food consists of rabbits, squirrels, woodchucks and occasionally sheep. (Reproduced from studies near Bates Hole, Wyoming.)

The abundance of bird life in this western lake beneath Mt. Shasta, which is seen in the center of the background, is astonishing. Here is an example of how the normal nesting habits of a bird may be changed by its being driven into a different locality. In **Klamath Lake Group** the group are white pelicans which usually make a nest of pebbles, Caspian terns which commonly build their nests on sand, and cormorants that nest on rocks, all nesting together here on the tule or rush islets of the lake. (Reproduced from studies at Klamath Lake, Oregon.)

The scene represented in this group is above timber line on the crest of the Canadian Rockies — 8,000 feet above the sea. Although these mountains are in the temperate region the altitude gives climatic conditions that would be found in the far north, and the bird life is arctic in character. Here **Arctic-Alpine Bird Life Group** are nesting the white-tailed ptarmigan, rosy snow finches and pipits. (Reproduced from studies in the Canadian Rockies.)

This group shows a stretch of western plateau covered with sage bush. In this bush is seen the male sage grouse strutting and wooing a mate. (Reproduced from studies at Medicine Bow, Wyoming.) **Sage Grouse Group**

The prairie chickens are akin to the common grouse. The group represents a typical scene during the mating season. The male birds go through most surprising antics in their efforts to attract the females. They inflate the orange-colored sacs on the sides of their necks, dancing and strutting about and uttering a loud, resonant, booming note. (Reproduced from studies near Halsey, Nebraska.) **Prairie Chicken Group**

The wild goose is one of the first birds to migrate north in the spring. It nests in the lakes of Canada even before the ice is melted. To secure the young birds for this group it was necessary to hatch the eggs of the wild goose under a hen, so difficult is it to find the young in nature. (Reproduced from studies made at Crane Lake, Saskatchewan, Canada.) **Wild Goose Group**

The grebe is another of our aquatic birds which builds its nest near the water. During the incubation period the parent bird usually covers the eggs with grass and reeds when leaving the nest. Nesting at the same lake with the grebe was the **Grebe Group**

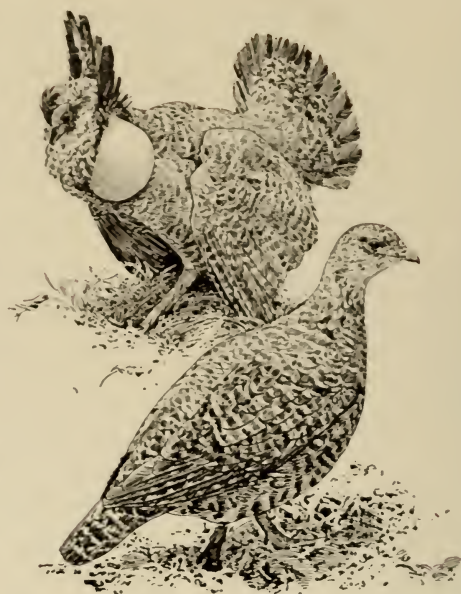
redhead duck, which lays from fifteen to twenty eggs. (Reproduced from studies made at Crane Lake, Saskatchewan, Canada.)

The loon is justly famed for its skill as a diver, and can swim with great speed under water. Its weird call is a familiar sound on the northern New England lakes. Many loons pass the winter at sea fifty miles or more from land. (Reproduced from studies at Lake Umbagog, New Hampshire.)

This rocky island thirty miles from shore in the Gulf of St. Lawrence affords some protection to the sea birds which still nest in great numbers

on and in its cliffs, although the colony is a mere shadow of what it was even fifty years ago. Seven species are shown nesting in the group. Namely the razor-billed auk, petrel, gannet, puffin, kittiwake gull, common murre and Brunnich's murre. (Reproduced from studies at Bird Rock, Gulf of St. Lawrence.) This was the first habitat group.

[Return to the South Pavilion containing the apes and monkeys.]



Love making of the prairie chicken. In this position and with orange-like air sacks inflated, he produces a booming sound which may carry a distance of two miles

WEST CORRIDOR

PUBLIC HEALTH

Returning to the South Pavilion where the monkeys are, and passing to the right, we enter the *West Corridor* containing the exhibits of the Department of Public Health.

The Hall of Public Health is dominated by a bronze bust of Louis Pasteur, the founder of scientific bacteriology and preventive medicine, which was presented to the Museum through the courtesy of the Pasteur Institute of Paris. Near the head of the stairway is a reading table where pamphlets bearing on insect borne disease and other public health problems may be consulted.

The first section of the exhibit deals with the natural history of water supply as it affects the life and health of man. Large photographs at the entrance to the corridor on the left illustrate the primary source of water supply, the clouds, and the secondary sources, the rivers and lakes. Diagrams, models and a relief map show the variations in rainfall at different points in the United States. Relief maps of the region about Clinton, Massachusetts, before and after the construction of the Wachusett Reservoir for the water-supply of Boston, show the way in which surface water supplies are collected by impounding streams, and a model of a well sunk through impervious to water-bearing strata shows how ground-water supplies are obtained. A series of samples and models illustrate the variations in composition which occur in natural waters, from the swamps of Virginia to the deep wells of Iowa and the turbid rivers of the Ohio valley.

Some of the principal micro-organisms, Algæ and Protozoa, which grow in reservoirs and impart tastes and odors to water are represented by a series of glass models. The effect produced by the pollution of water by disease germs is illustrated by relief maps and diagrams showing the course of famous typhoid and cholera epidemics. Models are displayed which illustrate the purification of water by storage, filtration and disinfection, the filter model being an elaborate representation of the plant at Little Falls, N. J. Diagrams and models indicate the results of water purification as measured both in dollars and cents and in the saving of human life. Finally a series of five large relief maps shows the growth and development of the water supply of New York City.

Following the water-supply exhibit is a series of models illustrating the dangers from improper disposal of the liquid wastes of the city and how they may be avoided. Actual points of danger in the neighborhood of New York are shown where polluted harbor waters, bathing places and shell-fish beds are a menace to health. The modern methods for the treatment of sewage on scientific lines are illustrated by a series of models of screens, sedimentation tanks and filter beds of various types.

The cases near the window are devoted to the group of Bacteria, especially in their relation to human life. Glass models show the various shapes and relative sizes of these minute forms and in particular of the principal types which cause disease. In a nearby case are displayed actual colonies of a number of species of bacteria including some which produce disease and others which are beneficial to man by their effect upon soil fertility or the fact that they may be utilized in the production of substances useful as foods or in the arts. A group of transparencies at the window shows some of the more important disease bacteria as they appear under the microscope.



THE HOUSE FLY OR TYPHOID FLY

Model 64000 times the bulk of a fly. By Ignaz Matusch from his original studies

Another series of exhibits deals with the transmission of disease by insects, notably by the fly and flea. The most striking feature of these is a model of the fly, a little over a foot in length, and having the bulk of 64,000 flies. This, the finest model of the kind ever made, was prepared by Ignaz Matusch from his original studies, and required nearly a year of constant, exacting labor.

The egg, larva and pupa of the insect are also shown modeled on the same scale.

Models in the wall case deal with the life history of the fly showing its various stages in their natural size and actual habitat and illustrate the large numbers of flies which may breed in a single pound of manure and the enormous progeny which may spring from a single pair and their descendants during the breeding season.

The deadly work of the fly in carrying typhoid fever is illustrated by a representation of two companies of soldiers, showing the comparative mortality from flies and bullets during the Spanish-American war. One company confronted by a cannon, suffers the loss of one man wounded; another facing a tube of typhoid germs — distributed by flies — has one dead and thirteen in the hospital.

Wall drawings near by show how the fly may carry typhoid bacilli on its foot, with the number of bacteria found on flies in sanitary and unsanitary surroundings; and illustrate the allied species, the stable fly, which it is thought may carry infant paralysis and other diseases.

Nearby are two models showing unsanitary and sanitary conditions on a small farm. In one, pools of stagnant water and uncovered manure heaps and general uncleanness favor the breeding of mosquitoes and flies, while the open doors and windows give these insects free access to the house. In the other, the swampy land is drained and cultivated, the windows screened, the shallow dug well replaced by a driven well; the conditions are sanitary and health and prosperity replace sickness and poverty.

Various types of traps for larvae and adult flies are shown with models illustrating how fly breeding may be prevented and how human wastes may be protected from their access.

The relation of the flea and the rat to the terrible disease bubonic plague is illustrated in considerable detail. Wall charts illustrate the spread of the great historic epidemics of this disease and reproductions of sixteenth and seventeenth century drawings show with what terror the Black Death was regarded in pre-scientific days. The chief carrier of the disease, the flea, is shown in a remarkable model 120 times the length of the actual insect and having the bulk of 1,728,000 fleas, prepared by Ignaz Matusch.

Specimens of some of the principal animals which harbor the plague germ and serve as reservoirs from which it is carried by the flea to man (the black,

brown and roof rats, the wood rat and the California ground squirrel) are shown and the manner in which the disease is disseminated is illustrated by a copy of a corner of a rat infested house in California. The original from which this was copied as well as many of the rats and squirrels were obtained through the courtesy of the U. S. Public Health service of Washington. Preventive measures against the plague are illustrated by models of a farm with buildings rat-proofed and of a ship at a dock equipped with guards to prevent the access of rats to the shore.

In a window case are shown various stages of the common mosquito, *Culex*, as well as of *Anopheles*, the carrier of malaria and, *Aedes*, which is responsible for the spread of yellow fever. **Mosquitoes and Other Insect Carriers of Disease** In the same case are specimens of other insect carriers such as the flea, the bedbug and the louse. Small cases flanking the windows contain specimens of the *Glossinas* which transmit sleeping sickness and the Nagana disease in Africa and of the ticks which spread Texas fever of cattle and relapsing fever, African fever and Rocky Mountain Spotted Fever of man. Nearby are shown maps indicating the area affected by the principal tick fever in the United States and a model of a dipping vat used in freeing animals from tick infestation.

A series of models and diagrams is devoted to the life history of the *Anopheles* mosquito and its relation to malaria. A relief **Mosquitoes and Malaria** map of the State of Arkansas illustrates the coincidence between low swampy lands and the prevalence of malaria and another shows the heavy incidence of malaria in the vicinity of marsh-lands near Boston. A full size model and a small relief map indicate the type and arrangement of drains used for lowering the water level and eliminating mosquito breeding pools and diagrams illustrate the progress made in mosquito control in New Jersey and the financial return which has resulted.

Two tree trunks, one normal and the other infested with fungi as a result of mechanical injury illustrate the important fact **Vital Resistance and Disease** that the normal plant or animal is able to resist disease while anything which tends to lower vital resistance may open the way for the invasion of pathogenic germs.

[See *Guide Leaflet No. 33.*]

The collection of Auduboniana, or objects relating to the life and works of John J. Audubon, presented to the Museum by his grand- **Auduboniana** daughters, Maria R. and Florence Audubon, occupies the stairway hall. It includes original sketches and paintings by Audubon and his sons, illustrations in various stages from the Quadrupeds of North America, and some of the copper plates of the Birds of North America. The most important piece is a large painting of a covey of "English" pheasants, flushed by a dog recently presented by Miss M. Eliza Audubon. Of more personal interest is the gun carried by Audubon on many of his expeditions and a favorite buckskin hunting coat.

SOUTHWEST WING

INDIANS OF SOUTH AMERICA

Passing through the west corridor, where the exhibit of the Department of Public Health is installed, and on into the adjoining hall to the west, we find the collections from South America. The greater part of the hall is filled with archaeological material illustrating the various forms of culture existing in Colombia, Ecuador, Peru, Bolivia and Chile in prehistoric times. The remains found in Peru, in parts of Central America, and in Mexico show a degree of culture far in advance of that attained in any other part

Indians of
South
America



PIECES OF CLOTH FOUND WITH PERUVIAN MUMMIES

The prehistoric Peruvians were familiar with modern weaves including the finest gobelins and produced highly decorative effects by harmonized colors and a repetition of woven-in designs. The Museum's collection of mummy cloths is one of the largest in the world, and is much used by teachers and students of art

of this continent in prehistoric times. Unlike the ancient peoples of Mexico and Central America the Peruvians had no written language. They were tillers of the soil and raised maize, potatoes, oca, quinoa, beans, coca and cotton. The Incas domesticated the llama, which was used as a beast of burden. They excelled in the manufacture and decoration of pottery vessels, in metalwork, and in textile fabrics. In the case directly in front of the

Gold and
Silver

entrance are displayed gold and silver objects such as beads, cups, pins and ear ornaments which show the high degree of skill attained in the beating, soldering and casting of

metals. In weaving they were perhaps preeminent among prehistoric peoples, many of their specimens exhibited here being unsurpassed at the present day. The materials used were

Textiles

cotton and the wool of the llama, alpaca and vicuna. In the first cases on the right are examples of these textiles with looms and shuttles. [The musical instruments of ancient Peru are discussed in *Guide Leaflet No. 11.*]

The alcove cases are geographically arranged, showing exhibits from



PERUVIAN MUMMY BUNDLES AND MUMMY

The ancient Peruvians wrapped their dead in fabrics of fine cotton and wool, then covering with a sack of strong cloth. The mummy "bundle" thus produced was often given a "false head" of cloth filled with cotton or vegetable fibre. Climatic conditions in Peru have preserved these mummies and their wrappings during many centuries

the north toward the south of South America, then up into the interior of the continent. In the wall cases extending across the entire western end of the hall will be found a remarkable collection from Nazca, Peru. The prehistoric people of Nazca excelled as colorists, particularly in the decoration of their pottery vessels which are certainly the most beautiful so far discovered in South America.

The special exhibits in the gallery rail cases include quipus used to



AN EXAMPLE OF NAZCA POTTERY

keep accounts, charms and medicines, coca which was chewed with lime, and shells that were found in mummy-bundles and in the graves. A number of the chicha jars are on exhibition on top of the cases.

In the first case to the left (south side) is a collection of skulls showing many examples of trephining, artificial deformation and pathological conditions, together with a number of normal Peruvian skulls for comparison.

The wall case at the left of the entrance contains mummy bundles and various objects showing the burial customs of the Peruvians. In no part of America are found so many and so extensive burial places as in the coast region of Peru. Here were interred countless thousands of the ancient dead. In the *huacos* or graves, with the bodies, were placed such articles as had been most useful and highly prized during life, and such as it was considered would be most serviceable in a future life.

To this custom we are indebted for no small part of our knowledge of the daily life of the ancient Peruvians. From the mummy bundles and



TREPHINED SKULLS FROM PREHISTORIC PERUVIAN GRAVES

graves all the objects in the extensive collections in this hall, illustrating their civilization have been obtained. The wonderful state of preservation shown in the textile fabrics and other perishable materials from the coast regions is due to the extreme dryness of the climate and the nitrous character of the soil. [See *Guide Leaflet* No. 24.]

The mummy in the case at the west end of the room was found in a copper mine at Chuquicamata, Chile. The body is that of an Indian miner who was killed by the falling in of rocks and earth while engaged in getting out the copper ore (atacamite) used by the Indians in making implements and ornaments in prehistoric times. The tissues of the body have been preserved by copper salts with which it is impregnated. The implements he was using at the time of his death are shown beside him in the case.

On the south side of the hall are the ethnological collections from Brazil, British Guiana, Paraguay and Colombia. War implements, basketry, featherwork and musical instruments etc. are arranged in these cases.

SOUTHWEST PAVILION

CHINESE AND SIBERIAN COLLECTIONS

If we pass on into the hall at the extreme west end of the building, we



ANCIENT CHINESE BRONZE

find collections from eastern and northern Asia. The arrangement is geographical. Read carefully the label at the entrance to the hall. Specimens illustrating the culture, industries, religion and manufactures of China are on the left; others showing the mode of living, the costumes and the war implements of Siberia are on the right. The furwork, costumes and rugs of the people of East Siberia reveal remarkable skill in workmanship. Two models show respectively summer and winter scenes in Siberia. A small model in one of the cases to the left shows the manner of making pottery. A series of frames in the rear contain pieces of various kinds of fabrics and patterns illustrating weaving and woodwork ornaments.

The collections deal mainly with



BLACK HELMET OR CAMEO SHELL

From the Morgan Collection. This species, found in the West Indies is the one most commonly used for cutting cameos

the everyday life of the Modern Chinese and have a special value as they were made just before the sweeping changes of the last few years took place. These abolished many of the customs in which these objects were used; for example, the series of weapons and objects showing the tests to which a soldier was submitted on entering the army have been rendered obsolete by the introduction of modern weapons and tactics. Bamboo, porcelain, basketry, inlaid work, cloisonne enamel, agricultural implements, carvings in wood, ivory and stone, and embroidery are exhibited.

A special collection of great value is found in the ancient bronzes shown in the adjoining tower room.

WEST WING

SHELLS

The collection of shells installed in the *West Wing* contains altogether about 100,000 specimens representative of nearly 15,000 species. These show extraordinary range of color and ornamentation. The arrangement of the collection is as follows: first, in the south wall cases a series showing briefly the classification of mollusks; second, in the eight table cases at the north and south ends of the hall the collections of land shells; third, in the upright railing cases the bivalves or mollusks which like the common clam have two shells; fourth, in the sloping cases the univalves, mollusks which have only one valve or shell like the snails; fifth, special exhibits of shells in the north wall cases. Other cases contain exhibits illustrating the anatomy and habits of mollusks; colored transparencies show them in their habitats.

Short descriptive group labels will be found in the cases, and on the walls, picture labels of important families of shells, together with small maps of distribution defining the occurrence of the same throughout the world and a large map showing the regional distribution of marine shells.

An interesting collection of deformed shells is seen in the north case, and a series illustrating the ornamental uses of shells. Cases of especial beauty in their shell contents are those holding *Murex*, *Fusus*, *Voluta*, *Conus*, *Oliva*, *Strombus*, *Cypraea*, *Nisitra*.

[Return to the South Pavilion, containing the apes and monkeys.]

SOUTHEAST WING

MAMMALS OF THE WORLD

Proceeding east from the hall where are the apes and monkeys, we pass the elevators, to enter the hall of the *Southeast Wing*, devoted mainly to the Principal Families of Mammals and their Evolution in Past Ages. The exhibits read like the pages of a book from left to right, being arranged

Mammals of the World to bring out the phylogeny or past history and development of the chief divisions of mammals. The specimens are arranged not on shelves but close against the background

of the case on small projecting supports and from each a cord has been stretched down along the background to a diagrammatic representation of the geological periods. In this way are indicated the relationships of the various animals to one another as well as the geological age in which each animal probably originated. Circling the hall above the cases is a mural frieze representing marine scenes, which serves as a background for groups of porpoises, dolphins and other small members of the whale family. The most striking object in the hall is the life-size model of a sulphur-bottom whale, seventy-nine feet in length. The original of this specimen

Model of Sulphur-bottom Whale was captured in Newfoundland and the model is accurately reproduced from careful measurements. This huge creature is not only the largest of living animals, but, so far as we know, the largest animal that has ever lived: A specimen of this size weighs from sixty to seventy tons, about twice as

much as *Brontosaurus*. As can be seen by examining the models of a whale's head attached to the pillar, the whalebone which takes the place of teeth hangs in great plates from the inside of the upper jaw. This whalebone acts as a strainer in the mouth of the whale and extracts the small animals from the sea water which the whale takes into his mouth when feeding. The food consists mostly of tiny crustaceans less than an inch in length. Although whales and porpoises live in the water they are not fishes, but are warm-blooded and breathe by means of lungs, not gills. The whale must come to the surface to breathe and the so-called "spouting" is merely the result of the warm air being expelled from the lungs when he breathes. A whale does not spout *water* as is commonly supposed. Models to scale of the other whalebone whales, and the toothed sperm whale, and skeletons of the smaller whales are hung near for comparison.

The plans for the next addition to the Museum building include a large hall to contain whales and other marine animals.

In the railing cases are exhibits which aim to give the visitor a general view of the enormous Class of Insects. This series is, at present, being rearranged and improved. When finished, it will include representatives

of all the principal families, exotic as well as native. A special exhibit of the common Butterflies near New York City and another of the "Moths of the Limberlost" has been installed. There is also one showing butterflies found in North Temperate America. There are nearly half a million species of insects in the world so that, even when finished, this series can contain only a small part of the total. Furthermore many of the species would fade rapidly if exposed to the light. The general study collection of insects is on the fifth floor and while it is not on exhibition, the curators are glad to show it to visitors who can make use of it. See the Southeast Pavilion for the study collection of local insects.

SOUTHEAST PAVILION

HALL OF INSECT LIFE

Still going east, we enter the *Insect Hall*. The installations in this hall point out the relationships, through origin and mode of life, of insects to each other and to the other members of the Animal Kingdom, especially to man. The exhibits are arranged in a continuous series and are numbered so that we can easily follow the plan beginning at the pillar farthest to the left.

First is an introductory section illustrating by diagrams the importance of insects as shown (a) by the large number of species compared with other animals [there are more species of insects than of all other animals put together] and (b) by their great influence on human interests. In the United States, the economic loss by insects is more than five times as great as by fire and there are more than twelve times as many deaths from insect-borne diseases as from railroad accidents. On the other hand, many of our crops and all beautiful flowers are largely dependent upon pollination by insects.

Following this are a number of sections showing the relationships of insects to other animals, explaining the terms used in the classification of insects and exhibiting typical examples of the principal families.

There is then given a summary of the principles underlying evolution as illustrated by insects. This series concludes with a discussion of the Mendelian Law of Inheritance which has been so greatly elaborated by experiments on the common fruit fly, *Drosophila ampelophila*.

Insect life in its various phases follows, leading up to the economic relations between insects and man. The latter topic is introduced by a consideration of insects' enemies, including man, and then certain insects are shown as enemies of man.



GROUP OF MIGRATORY BUTTERFLIES

It concludes with exhibits of silk worms and honey bees — insects whose products are commercial commodities. In connection with the honey bee, other social insects are exhibited.

There is then a series of sections devoted to insects in art and literature, concluding with photographs of prominent entomologists and instructions concerning the collection and preservation of insects. [*See Guide Leaflet No. 39.*]

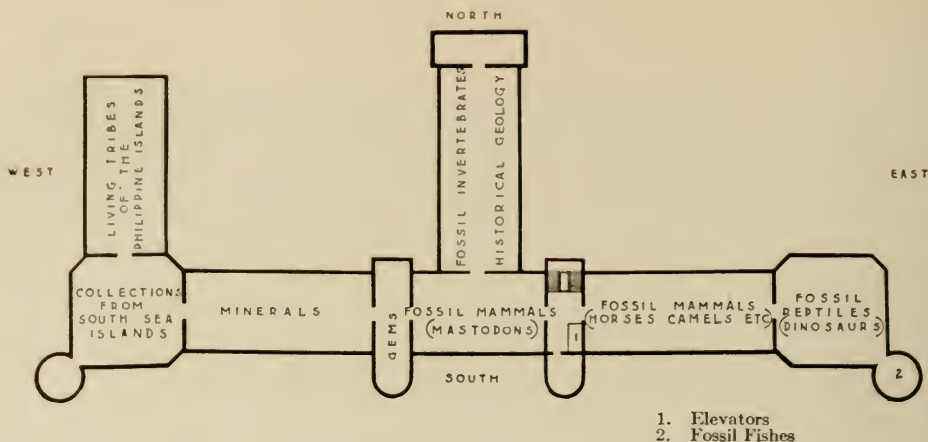


PART OF THE CICADA GROUP

Visitors desirous of studying the local insects more in detail are cordially invited to do so by consulting the nearly complete collection to be found in this hall under the custody of the New York Entomological Society which holds its meetings in an adjoining room.

It is primarily intended to be an aid in the identification of specimens and is not a part of the general exhibition series.

(Return to the elevators and ascend to the Fourth Floor.)



FOURTH FLOOR

FOREWORD ON FOSSIL VERTEBRATES

In the *East Corridor*, and the *South Pavilion* at the left, as well as in the *East Wing* and *Southeast Pavilion* at the right are displayed fossil mammals, reptiles and fishes.

In a general way, fossils are the petrified remains of plants or animals that lived at some past period of the earth's history. In many instances we have not the objects themselves but only their casts or impressions in the rocks. This is particularly the case with shells. Sometimes, as with the bones of the great Irish elk the objects have been buried in swamps or bogs, and in a few rare instances as with the mammoth and woolly rhinoceros, entire animals have been preserved for thousands of years in ice or frozen mud. Fossils are found in localities where the dead animals or plants have gradually been buried under layers of sediment to such a depth that they come in contact with the mineral waters of the earth and finally become petrified. Later through subsequent upheaval and erosion they are again brought to or near the surface of the earth. Petrification is the slow replacement of animal or vegetable material by such minerals as carbonate of lime or silica. The process is very slow and for this reason flesh is never petrified. Fossil beds are found in every continent. In our own country, Texas, Montana, Wyoming, and the Bad Lands of South Dakota are famous for their large fossil beds, and many of the finest and rarest fossils in the Museum were obtained in these localities.

As it takes thousands of years for the various layers of earth to accumulate over the bones, and for the latter to become petrified, the study of fossils and the strata in which they are found is an important aid in determining the age of the earth and the succession of life thereon. Many of the skeletons exhibited in these halls are of animals which lived from 30,000 to 20,000,000 years ago. To prepare a specimen for exhibition the

matrix in which the bones are imbedded is carefully chipped away and the missing parts restored in cement and plaster. The bones are then assembled as in life. In the specimens on exhibition the restored parts differ in color from the original parts of the skeleton and can readily be distinguished.

As a whole, the Museum collections of fossil vertebrates are believed to be the finest in the world, if we take into consideration not merely numbers, but also variety, quality and perfected methods of preparation and exhibition. The collections illustrating the evolution of the horse are probably equal to those of all other institutions combined. The collections of Permian reptiles, of Jurassic and Cretaceous dinosaurs, of turtles, of North American Tertiary mammals, and of extinct mammals of South America, are likewise of the first rank. There are more than seventy complete skeletons on exhibition, several hundred skulls and nearly two thousand jaws or other parts of various species. About ten times this number are in storage, reserved for study and research, or not yet prepared for exhibition.

EAST CORRIDOR

FOSSIL FISHLIKE LIZARDS

Directly in front of the elevator is a wall case in which the most recently acquired specimens are placed. The cases attached to the wall near the stairway contain specimens of huge marine fishlike lizards, which show the tremendous pressure to which fossils are often subjected and the fragmentary condition in which they are found.

SOUTH PAVILION

MASTODONS AND MAMMOTHS

The visitor should first enter the *South Pavilion* in which are shown the skeletons of mammoths and mastodons, the prehistoric relatives of the modern elephants, and of the curious and extraordinary extinct animals which inhabited South America in prehistoric times, 30,000 to 100,000 years ago. On the left is a series of modern skeletons illustrating the evolution of the horse under the hand of man. Here are such extremes as the Shetland pony, only two feet ten inches high, and the rough-boned draught horse, which stands six feet one inch in height. Contrast these with the slender-limbed "Sysonby" the famous race horse, and the Arabian stallion "Nimr." Man by his intelligence has modified the form of the horse to meet his needs and has accomplished in a small degree but rapidly, what nature has done in an extensive way during long ages — as will be seen from the fossil horses in the next hall. The similarity in structure of the skeletons of horse and man is brought out in the exhibit of a rearing horse being controlled by man. A comparison of these two skeletons will show that with some modification the bones of the



THE GROUP OF GIANT GROUND SLOTHS

Fossil mammals from South America adapted for digging about the roots of trees for the purpose of pulling them down to feed on the leaves and twigs

(See Reprint, THE GROUND SLOTH GROUP, for a full description and Reprint the Ancestry of the Edentates for classification)

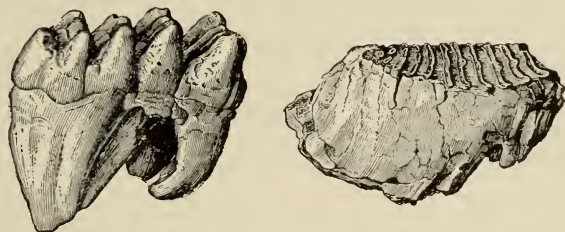
one correspond with the bones of the other. The horse lover will also be interested in the osteological collections in the wall cases which show how to tell the age of horses through the growth and development of the teeth.

Beyond the Horse exhibit on the left are fossils from South America, the most striking of which is the group of giant ground sloths. There are also good examples of the Glyptodon, a gigantic relative of the armadillo, of the camel-like *Mastocerauchenia*, the rhinoceros-like *Toxodon*, and other strange extinct animals which evolved in South America during the Age of Mammals, when it was an island continent, as Australia is to-day. Here too, is the great sabre-tooth tiger, one of the host of northern animals that invaded the southern continent upon its union with the northern world, and swept before them to extinction most of its ancient inhabitants.

The principal exhibits on the north side of the hall are the mammoths and mastodons and the series of skulls showing the evolution of the elephants. The "Warren Mastodon" is a classic specimen. It was found near Newburg, N. Y. in 1846, and is the finest specimen of its kind that has ever been discovered. There is some confusion in the mind of the layman between the mammoth and mastodon; in a general way they are both elephants, the main distinction

Fossil
Mammals of
South
America

Warren
Mastodon



Tooth of Mastodon and Mammoth

between them being in the character of the teeth. While modern elephants are confined to portions of Asia and Africa, fossil remains of elephants and mastodons show that at one time or another in the past, they were found over the greater part of the northern hemisphere.

Skeletons of the Asiatic and African elephants are shown for comparison with their extinct relatives and among these, is the once famous Jumbo, whose name has been embodied in the English language as a term for anything unusually large.

[See *Handbook* No. 4, *Animals of the Past*.]

SOUTHEAST WING

FOSSIL MAMMALS OF THE TERTIARY PERIOD

Return to the East Corridor and continue into the *Southeast Wing* or Tertiary Hall which contains the Fossil Mammals of the Tertiary Period.

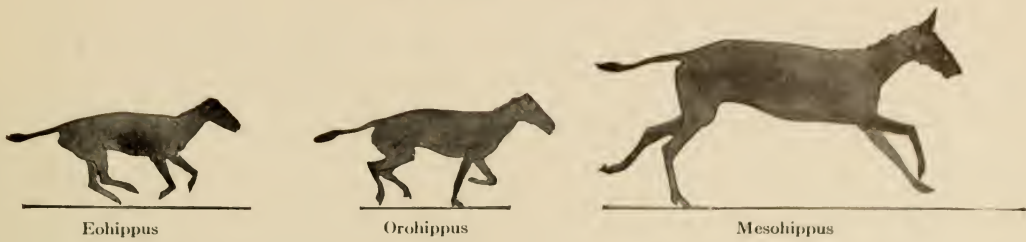
The geological age to which all the fossils shown in this hall belong, covers a period of from 100,000 to 3,000,000 years. At each side of the entrance are charts indicating the successive periods of time from the Triassic to the Tertiary, and the animal life which pertained to each. Careful guides and exhaustive cards of explanation, photographs, and window transparencies combine to make the entire exhibit illuminative and interesting.



Restoration of *Eohippus*, the four-toed horse. This ancestor of the modern horse, scarcely larger than the red fox, lived some three millions of years ago. It comes from the Lower Eocene of Wyoming and New Mexico

The particular feature of this hall is the wonderful series in the cases by the entrance and in the first alcoves on the right showing the evolution of the horse in nature. The Museum is justly proud of this collection. Not only is it the largest and finest series of fossil horse skeletons in the world, but it is larger than the combined collections of all other institutions, and it contains the earliest known ancestors of the horse, the little four-toed *Eohippus*, which was no bigger than a fox and on four toes scampered over Tertiary rocks. As will be seen by an examination of the skeletons of the horse and man in the Quaternary Hall, the modern horse walks on the tip of his middle finger and toe. The front hoof bone corresponds to the last joint of the third finger in the human hand, and the other bones of the leg correspond bone for bone with the structure of the finger, wrist and arm of man. In the modern horse the remaining fingers or toes of the fore and hind foot

Evolution
of the
Horse



have entirely disappeared, or remain only as vestiges, the so-called "splint bones." The structure of the modern horse shows that it developed from a five-toed ancestor. This ancestry has been traced back to the four-toed stage. [See *Guide Leaflet No. 36. The Evolution of the Horse.*]

In the wall case at the right of the entrance is given a synopsis of the evolution of the foot and skull of the horse and the geological age in which each stage is found. Across the alcove the visitor will find the skeleton of *Eohippus*, the four-toed stage of the horse and the earliest form that has been discovered. This specimen is from the Wind River beds of Wyoming and may have lived 3,000,000 years ago. It is interesting to note that while there were no horses found in this country by the white settlers, America is the original home of the horse.

Passing from skeleton to skeleton the changes that have taken place in the development of the horse are easily distinguished. The exhibit is made more lifelike by plaster restorations of the animals and by water-color sketches showing primitive horses in their environment. These paintings and models are by Charles R. Knight. In the later types of the three-toed stage the two lateral toes have lost their original function of support and are gradually becoming vestiges. The three-toed horse in the center of the alcove is one of the most complete and finest examples that has ever been unearthed.

Opposite the horse exhibit on the other side of the hall, are series of specimens illustrating the evolution of the camel, deer and other cloven-hoofed animals. These animals like the cow of to-day walked on the tips of the third and fourth fingers, and the gradual disappearance or reduction to useless vestiges of the other fingers and toes can be traced as in the horse series.

The large blocks showing groups of skeletons of early camels, skulls and bones of primitive ruminants in their natural position in the rock, show how these specimens are sometimes found and raise questions as to how they got there, more easily asked than answered. The giant pigs, or elotheres, and the pygmy hippopotamus will repay examination.

The primitive rhinoceros-like animals are shown near the center of the hall on the right. It seems hard to believe that our vast western country and indeed all North America, was

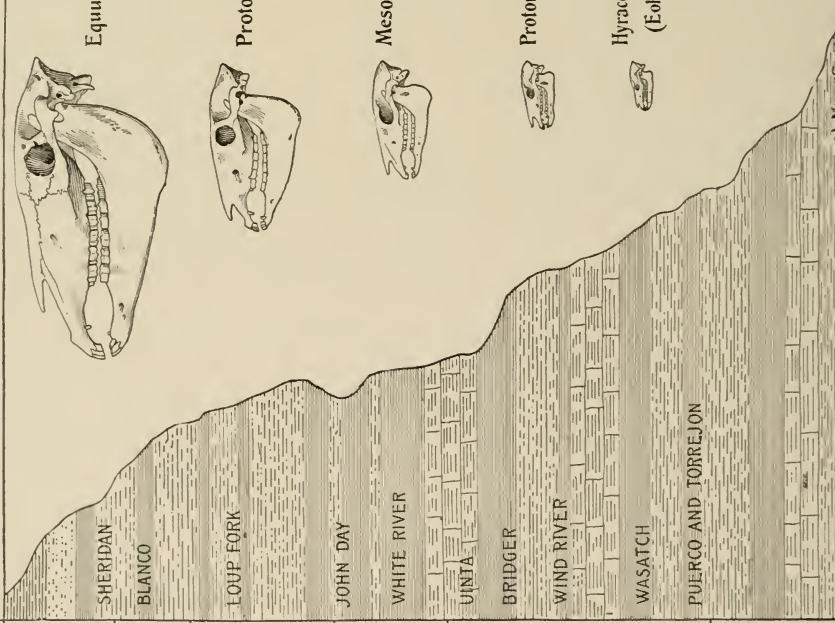



Camels

Giant Pigs
and Pigmy

Hippopotamus

Rhinoceros

THE EVOLUTION OF THE HORSE.

		Formations in Western United States and Characteristic Type of Horse in Each				Fore Foot	Hind Foot	Teeth
Quaternary or Age of Man	Recent Pleistocene			Equus		One Toe Splints of 2 nd and 4 th digits	One Toe Splints of 2 nd and 4 th digits	 Long- Crowned, Cement- covered
	Pliocene			Protohippus		Three Toes Side toes not touching the ground	Three Toes Side toes not touching the ground	
Tertiary or Age of Mammals	Miocene			Mesohippus		Three Toes Side toes touching the ground; splint of 5 th digit	Three Toes Side toes touching the ground	 Short- Crowned without Cement
				Protohippus		Four Toes		
	Eocene			Hyracotherium (Eohippus)		Four Toes Splint of 1 st digit	Three Toes Splint of 5 th digit.	
Age of Reptiles	Cretaceous Jurassic Triassic							

Hypothetical Ancestors with Five Toes on Each Foot
and Teeth like those of Monkeys etc.

The history of the evolution of the horse through the Age of Mammals gives the best example in existence of the doctrine of evolution by means of natural selection and the adaptation of a race of animals to its environment. During three millions of years these animals passed through important changes especially in the teeth and feet, adapting them more and more perfectly to their particular environment, namely open plains with scanty stunted herbage. This may be had in post card form

once the home of the rhinoceros. As here indicated great herds roamed over the fields in the Tertiary Period and their fossil remains are found imbedded in the sandstones and clays of the badland formations. Opposite these are shown the ancestors of the dogs, cats and other carnivores and the Creodonts or Primitive Carnivores of the early Tertiary. Next to these are the small mammals — the insectivores, rodents and marsupials; and the fossil lemurs and monkeys, fragmentary but interesting because of their bearing on the ancestry of man.

On the south side on the right are skeletons of titanotheres, on the left of Uintatheres, huge extinct, horned animals peculiar to North America.



Restoration of *Brontosaurus*. One of the largest of the amphibious dinosaurs, cold-blooded, slow-moving, unintelligent creatures that grew to large size (65 ft. in length) in the rich vegetation of the Reptilian era

SOUTHEAST PAVILION

FOSSIL REPTILES AND FISHES

The visitor now enters the *Southeast Pavilion* containing the dinosaurs and other fossil reptiles and also fishes. These animals belong to a more ancient period than the specimens just examined. They lived from 3,000,000 to 10,000,000 years ago. They include the well-

The Dinosaur known dinosaurs of which the Museum has a large collection.
Diplodocus In the wall case on the left is a portion of the skeleton of the dinosaur *Diplodocus*; this was the first of these speci-

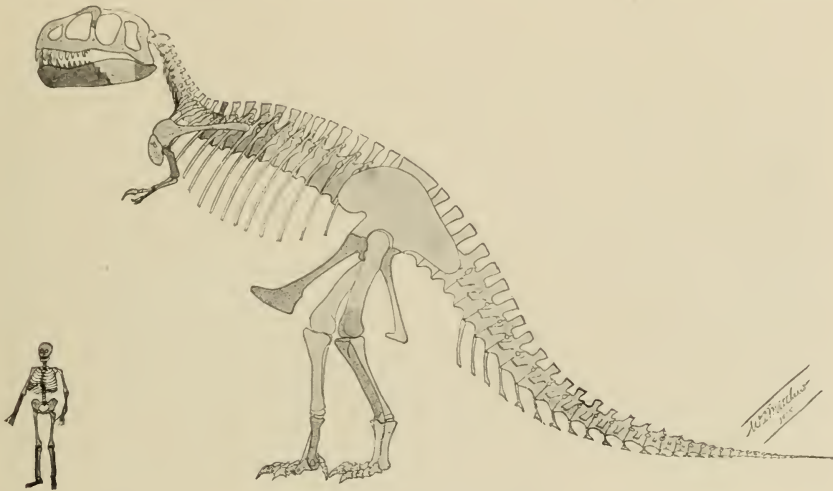


TRACHODONS OR DUCK-BILLED DINOSAURS

Fossil reptiles, fifteen to sixteen feet high and thirty feet long, with spreading webbed feet, compressed tail and duck-like bill, all of which indicate a more or less aquatic existence

mens to be unearthed by the Museum, while on the right is a nearly complete skeleton of a related species mounted as it lay when ten million years ago it settled to the bottom of a western lake where it was gradually covered with sand and mud and slowly turned into stone.

The gigantic skeleton in the center of the hall is the huge extinct reptile, the dinosaur *Brontosaurus*, found in the Jurassic beds of Wyoming. It is the only mounted specimen of its kind in the world and more than two-thirds of the skeleton is the original petrified bone. It is sixty-six feet eight inches in length, sixteen feet in height and is estimated to have weighed when alive thirty-five tons. Bronto-



TYRANNOSAURUS AND MAN

A man would have been but a mouthful for this the latest and largest of flesh-eating dinosaur. Skeletons of two of these monsters are now being mounted for exhibition.

saurus is one of the largest giant reptiles and as is indicated by its teeth was herbivorous, probably living on the rank water weeds of the nearly sea-level marshes of Wyoming. Contrasted with the herbivorous Bronto-

Allosaurus saurus, is the carnivorous dinosaur *Allosaurus*, mounted to represent the animal feeding on the fallen carcass of a Brontosaurus, upon which it preyed. This is not a fanciful mounting for these very skeletons were found in close proximity to each other in the Jurassic beds of Wyoming, and the skeleton of the fallen Brontosaurus shows gouges made by the teeth of Allosaurus as it tore the flesh from its victim.

Near the Allosaurus group is a portion of a skeleton of *Tyrannosaurus* the last and most powerful of the carnivorous dinosaurs. Like Allosaurus it has enormous three-toed hind legs, armed with sharp claws, and smaller forelegs. **Tyranno-**
saurus *Tyrannosaurus* is from Montana and the matrix in which it was found is as hard as flint.



RESTORATION OF THE JAWS OF A FOSSIL SHARK

This largest and most formidable fish, living or extinct, of which we have any record frequented the Coast of South Carolina in Tertiary time. The jaws measure nine feet across; estimated length of fish, eighty feet, as large as a sulphur-bottom whale

To the left of *Brontosaurus* are two complete specimens of the duck-billed dinosaur *Trachodon*. One shows the animal erect and standing on guard, while the other is shown feeding on shellfish and plants of the Cretaceous swamps of Montana.

Mummied Dinosaur Most wonderful, perhaps of all the specimens shown here is a "mummy" of *Trachodon* in which the texture of the skin is preserved.

The animal is lying on its back and, in spite of its crushed condition, its form is easily distinguishable. It probably died on a sand bank or near a shoal where the hot winds dried up the flesh until the skin adhered to the bones like a close-fitting glove, and was subsequently buried by a flood.



Section of the skin of *Trachodon* showing the small scutes with which the animal was covered. About natural size

Other specimens shown in the hall include the smaller carnivorous dinosaurs, the horned dinosaurs with, in one instance at least, a skull seven feet in length, and giant birds possessed of teeth. There is also the finback lizard, one of the most ancient of fossil reptiles; *Diadectes*, a reptile with a solid-boned skull and *Eryops*, a primitive amphibian. The finest collection of fossil turtles in the world will be found on the south side of the hall.

In the *Tower* of the Southeast Pavilion are displayed the fossil fishes which belong to a much earlier period than the mammals and reptiles, some of them having lived twenty to fifty millions of years ago. Many of these forerunners of back-boned animals are quite unlike any living fishes and are probably only very indirectly related to them; some were small, curiously encased in shells;

Fossil Fishes

others, shown in the three cases in front of the visitor, attained large size and were evidently formidable creatures. One of them in fact, *Dinichthys*, shown in the middle of the gallery, was probably among the most destructive creatures that ever lived in the sea. Its jaws were so strong that it could crush a plate of bone as thick as one's hand. Such an actual specimen, fractured in life and showing the marks of "teeth" is shown in a neighboring case.



RESTORATION OF NAOSAURUS

One of Nature's jokes. Professor Cope, who was also a joker, suggested that the high fin served as a sail, by means of which Naosaurus sailed over the lakes near which it lived

The collection is so arranged that he who makes the tour can see the principal kinds of fossil fishes and is able, in a measure, to outline the history and pedigree of the entire group. He can trace the rise and fall of the early plate-covered fishes; the era of the sharks which on the one hand supplanted the earliest fishes and were in time replaced by the more efficient lungfishes and ganoids; the age of ganoids when the waters were filled with these enamel-scaled fishes; finally the age of the bony-fishes, or teleosts, the multitudinous forms of to-day, the herrings, cods, perches, whose methods of swimming, feeding and breeding are far more efficient than those of any of their predecessors.

Above the entrance are the jaws (models), spreading nine feet, of a huge fossil shark in which the actual teeth are arranged as in the sharks of to-day, in the usual banks or rows — the teeth in the hinder rows serving to replace those in front, nature having dealt more kindly in the matter of teeth with sharks than with man. Such a shark probably measured from seventy to ninety feet and its race may well have become extinct, when for various

Jaws of
Giant Fossil
Shark

reasons the enormous volume of food necessary to support it could not be maintained within its range of sea.

Fossil Aquarium In the first alcove to the left, by the window, is a "fossil aquarium" in which a number of models of these earliest fishes are arranged in a group, as though alive in the sea.

Sharks In the next alcove are the early fossil sharks which superseded the tribe of plated fishes just mentioned. These sharks had soft skeletons, simple fins and a number of other primitive features which lead to the belief that all of the higher fishes, and the higher back-boned animals therefore as well, were descended from them, their simpler structures becoming more complicated in many directions. In one of the early sharks here exhibited, impressions of soft parts such as muscles and gill filaments have been preserved.

Chimæroids In the third alcove appear rare fossils of silver sharks or Chimæroids, which appear to have been developed from a primitive race of sharks. Curiously enough fossil egg capsules of these forms are sometimes preserved, and examples are here present. In neighboring cases are shown ancient lungfishes and ganoids — groups from which all land-living quadrupeds are believed to be descended.

Ganoids In the fourth alcove are shown the ganoid fishes which dominated the waters during the Age of Reptiles. They were of many kinds and sizes, most of them with lozenge-shaped scales of bone, with enamelled surface. One of the few survivors (*Amia*) of this ancient group is here shown living (in a window aquarium), to give the visitor a clearer idea of the fishes of the "Middle Ages" of the world.

Teleosts In the fifth alcove are the petrified fishes of the Age of Mammals. By this time nearly all of the primitive fishes, like sharks, lungfishes and ganoids, had become extinct; and the common forms were bony-fishes, or teleosts, closely related to our herrings, perches, mackerels and daces.

[Return to the South Pavilion or Hall of Mastodons and Mammoths.]

SOUTH CENTRAL WING

GEOLOGY AND INVERTEBRATE PALEONTOLOGY

Turning northward at the center of the Quaternary Hall containing the mastodons and mammoths, the visitor enters the *South Central Wing* of the building and is in the Hall of Geology and Invertebrate Paleontology. Owing to important changes in progress in the arrangement of this hall, but a portion of the collections are at present on exhibition, though all are available for study.



THE "FOSSIL AQUARIUM" IN THE FISH GALLERY

This shows what can be done to make these ancient forms appear as living. The group illustrates the typical "Age of Fishes," Devonian, in which the forms came from a single locality (Cromarty) and a single rock layer in the Old Red Sandstone of Scotland. The seaweed is also a restoration, modeled from impressions of the same age. Cromarty is noteworthy, not merely for its deposits of Fossil Fishes, but for being the birthplace of Hugh Miller whose discoveries and descriptions did so much to make the fishes known alike to the scientific world and the general public.

At the entrance of the hall is the general collection of meteorites, which is one of the largest and most representative in this country, containing as it does specimens from about five hundred of the seven hundred falls and finds that are known throughout the world. Some of the principal features of our collection are:

Two thousand or more individual masses from the "stone shower" that fell near Holbrook, Arizona, in 1912. These have been arranged in a case by themselves in the middle of the collection.

The whole mass of Ysleta, a newly discovered (1914) iron meteorite, weighing 310 pounds from near the ancient village of Ysleta, New Mexico.

A series of polished and etched large slices of iron meteorites, including an entire section of the new Mt. Edith, Australia, mass, showing the Widmanstätten lines in great perfection, and polished slabs from several large stone meteorites. These are in a case by themselves which likewise contains several comparatively large entire single masses of some famous falls.

An exhibit of meteoritic masses, decomposition products, and country rock showing unaltered material and that which was melted and otherwise altered by the impact of the Canyon Diablo meteorite at the spot now known as Meteor Crater, Arizona. This exhibit has been loaned to the Museum by Princeton University.

The desk case in the first alcove to the left as one enters the hall contains a series of rock specimens showing the geology of Manhattan Island. This is arranged geographically and illustrates all the most prominent features of immediately local geology from south to north.

Going northward in the hall the next large exhibit to attract the attention of the visitor is the stump and part of the roots of a large tree from an anthracite coal mine under Scranton, Pa. Millions of years ago, in the geological period known as the Carboniferous, this tree grew upon the top of a thick swamp deposit of decaying vegetation which ultimately became a most valuable bed of coal. The stump was left in the roof of the mine when the coal was extracted for commercial and domestic uses. It fell to the floor years after the gallery had been abandoned and was discovered only through the chance visit of a miner.

Next the visitor will see an exhibit illustrating some of the results of an expedition which the Museum sent to Martinique and St. Vincent during the great volcanic eruptions of 1902-1903 that devastated those islands of the Lesser Antilles chain. A set of four relief maps shows the island of Martinique and its famous volcano, Mont Pelée, at three important stages of the eruptions, while the nearby cases and pedestals contain relics of the ruined city of St. Pierre and the dust, stones and bread-crust bombs that were thrown out in a white hot or molten condition

by this volcano and by the Soufrière of St. Vincent. Nearly 30,000 people were killed by these outbreaks. Important geological facts were learned from the observation and subsequent study of the series of events.

An attractive case is that containing some marvelously beautiful specimens of calcite, aragonite and gypsum from the famous Chihuahua silver-and-lead mines near Santa Eulalia in the vicinity of Chihuahua, Mexico. These specimens are remarkable for the perfection of their crystalline form or the delicacy of their fibrous developments and for their colors.

The northeastern corner of the hall is devoted to the Copper Queen Mine Model and a series of ores and other specimens from the famous Bisbee-Warren copper district in southern Arizona. Two models have been prepared as a result of several years of extremely painstaking and skillful work. A large model, some 18 by 12 feet in dimensions shows on a scale of twenty-four feet to the inch all the surface features and mine and other buildings over four of the principal mines (Holbrook, Spray, Gardner and Lowell) belonging to the Copper Queen Consolidated Mining Company, while a painted background represents the surrounding mountains and the town of Bisbee. The sides of the model give vertical sections to a depth of about 1200 feet illustrating the geology of the area and showing the general manner of getting out the ore and hunting for new deposits. There have been produced in about 30 years (1880-1912) from the mines at Bisbee belonging to this company 7,729,922 tons of copper ore of an average copper content of 7.16%. The metal production in this period was

Copper	— 1,106,605,774 pounds (553,303 tons)
Gold	— 104,775 ounces Troy (8,731 pounds)
Silver	— 6,107,421 ounces Troy (508,952 pounds).

Near the large general model there has been installed a small model on a scale of six feet to the inch showing the usual methods of extracting the ore by "stoping." Drilling, picking, timbering, filling old cavities, transporting, raising ore to the surface and other operations are illustrated as well as is practicable on the scale adopted. The shaft is equipped with its cages, which are arranged so that they go up and down by means of automatic machinery.

Specimens of ore, minerals and rocks from the mine and the adjacent country illustrate the geology of the region. Chief of these specimens are velvet malachites that were taken from the original "Queen" mine, the Open Cut, in the early eighty's and a great block of malachite and azurite weighing about four tons taken from the Mine in 1892 and exhibited in the Arizona mining exhibit at the Columbian Exposition in 1893. Enlarged photographic transparencies give details of scenery and mining, supple-

menting what is shown by the models. The work of treating the ores at the smelter in Douglas near Bisbee is demonstrated in a neighboring case.

The northwest corner of the hall contains a display of caves and cave material the most important feature of which is the reproduction of part of a beautiful cave that was discovered early in 1910 in mining operations at the Copper Queen mine. The cave was formed by the dissolving action of water traversing joints in limestone, and its walls, roof and bottom were afterward coated with calcite (calc spar) incrustations, stalactites and stalagmites, some of which are dazzling white while others are colored green with copper salts or pink with manganese compounds.

Alongside the Copper Queen cave a reproduction of a chamber in Weyer's Cave, Virginia, is being installed. Weyer's Cave is in a region of much heavier rainfall than Bisbee, which is probably the principal factor in producing a greater wealth of regular stalactite and stalagmite growth than adorns the Copper Queen cave.

The cases along both sides and down the middle of the hall contain geological and palæontological specimens. Palæontology is the science of the ancient life of the earth; its field is the study of the fossilized shells and other hard parts and the various kinds of imprints left by the animals formerly inhabiting the seas and lands, and preserved in deposits which now form our stratified rocks. As normally the upper layers of a series of strata are more recent than the lower, the fossils reveal the succession of life forms in the earth's crust and thus are of the highest value and interest to the student of historical geology. Since, however, the remains of only a small proportion of the animals living at a given period are permanently preserved in the marine, river, lake and subaërial deposits of that period, the geological record of animal and plant forms is far from complete. Inasmuch as invertebrate animals are far less free in their movements than the vertebrate forms, they are accepted as the best determinants of the geological age of a bed of rock, even when remains of both kinds are found together. Invertebrate life, too, appeared on the globe far earlier than vertebrate, and remains of certain species are abundant in the lowest (oldest) of our stratified rocks.

The specimens in the cases on the west side of the hall are being arranged to illustrate historical geology, beginning at the south (entrance) with the Archean rocks, which are the lowest and oldest of all and contain no fossils, advancing regularly through the Cambrian, Ordovician, Silurian, Devonian, Carboniferous, Jurassic, Triassic, Cretaceous and Tertiary. Most of the specimens on exhibition are from American localities, but a synoptic series of European fossils is exhibited in the northwest quarter of the hall. The desk cases in the middle of the hall contain overflow material from the sides. Under

Historical Geology

the historical sub-division the species are arranged according to their position in the scale of life — that is, following a biological classification, the lower or simpler forms being placed first. The diamond-shaped bits of emerald green paper attached to some of the specimens indicate those, more than 8,000 in number, known as “types” or “figured specimens,” used by James Hall, R. P. Whitfield and others in the original description and naming of species or in their elucidation.

The upper shelves and the ends of the upright cases contain particularly large or striking specimens of fossils, or blocks of rock illustrating the geological features of the horizons in which the fossils occur.

Attention may be called also to the collection of Michigan copper ores, orbicular granites and diorites from several parts of the world, fossil crinoids from Waldron and Crawfordsville, Indiana, fossil corals from the Devonian reefs near Louisville, Kentucky, fossil crinoids and an immense clamlike shell from the Cretaceous of Nebraska, fossil plants from Tertiary beds at Florissant, Colorado. The windows contain some colored transparencies from photographs of interesting scenery in the West.

[Return to the Hall of Mastodons and Mammoths and turning to the right enter the West Corridor or Gem Hall.]



CRYSTAL BALL IN THE MORGAN COLLECTION

WEST CORRIDOR

GEMS AND PRECIOUS STONES

Gems and Precious Stones

The West Corridor contains the Morgan gem collection. This valuable series of gems and precious stones was presented to the Museum by Mr. J. Pierpont Morgan, one of the founders and a trustee of the institution. It comprises a representative assemblage of cut and uncut gems, many of the former of remarkable size and some of great purity of color. The installation aims to bring into juxtaposition, the cut and uncut material, the former is arranged around the latter, in the center of the cases, and the visitor may thus observe the brilliancy of effect produced in the natural mineral by skillful artificial treatment (cutting).



A PORTION OF THE GEM HALL

In the wall cases are many fine examples of quartz, calcite, malachite, azurite and amethyst. In the desk cases are cut and uncut diamonds, sapphires, topaz and other gems. The collection, presented to the Museum by the late Mr. J. Pierpont Morgan, includes many large and rare forms which could not be duplicated

A partial gradation in importance and value is obtained by the arrangement of the gems, beginning with Diamond at the extreme south and passing north, case by case (through Corundum (*Sapphire*), Beryl, (*Emerald*), Topaz, Tourmaline, Chrysolite, Spinel, Zircon (*Hyacinth*), Chrysolite (*Peridot*), Adularia (*Moonstone*), Opal, Amethyst, Kunzite, Amber, Pearls.) In one case a varied collection of semi precious or ornamental stones is shown, many of which are experimental efforts to use mineral material which can never have any very extended use, viz., prehnite, titanite, sphalerite, hematite, cyanite, etc., etc.

Handsome wall case specimens of large size line the sides of the Gem room, among which the Azurite, Malachite, Quartz, Amethyst, Gypsum and Tourmaline are pre-eminent for size or beauty.

SOUTHWEST WING

MINERALS

Next beyond the Gem Hall is the *Southwest Wing* or Hall of Minerals. At the entrance to the hall is a case in which recent acquisitions are placed.

The general collection of minerals consists chiefly of the well-known Bement Collection which contains specimens representing species of the known minerals of the world. Not only is the collection noted for its numbers, but in many instances the beauty and size of the individual specimens are quite unsurpassed in other collections.

The more attractive specimens are displayed in cases arranged down the center of the room. The remainder of the collection is arranged according to the classification of minerals. In the first cases on the right or left are models of the six systems of crystals and other introductory illustrations of the physical and optical properties of minerals. Each mineral has a characteristic form of crystallization which is one of the means of identifying it. The distribution of the more important minerals is indicated on maps.

SOUTHWEST PAVILION

COLLECTIONS FROM THE PACIFIC ISLANDS

Entering the *Southwest Pavilion* beyond the Hall of Minerals the visitor will find specimens pertaining to the natives of the Pacific Islands. The wall cases contain examples of war implements, tapa or bark cloth, sacred masks, boomerangs and armor.



TAHITIAN FIRE-WALKER

In the fire-walking ceremony the priest and his followers walk barefoot over a row of heated boulders of basalt



HAWAIIAN FEATHER CLOAK

The central figure in this hall is a Tahitian priest represented as taking part in the fire-walking ceremony, in which the participants walk over heated boulders of lava. On either side are groups engaged in grating cocoanut, making kava, weaving mats for houses.

In the box case behind the Tahitian fire-walker there is exhibited a striking series of Melanesian masks, a few fashioned from the facial portion of human skulls, the majority carved of wood. These masks are worn by dancers during festivals in honor of the dead. Near the window there is a case of sacred Melanesian carvings topped by a totem pole that bears a superficial resemblance to the totem poles of the North Pacific coast of America.

The cases in the center contain kava bowls, head rests, shell and ebony armlets and other ornaments, betel spatulas, ceremonial paddles, hats, mats and baskets. These people follow the custom of tattooing themselves. Their occupations as here detailed are peaceful rather than warlike. The swinging picture-frames on the left of the entrance midway down the room give some idea of the dress, customs, and pastimes of the South Sea Islanders.

A noteworthy object is the cloak from the Hawaiian Islands, made of red and yellow feathers. Such cloaks were worn by chiefs — and as each bird furnished but few feathers and, considering the value put upon them and the time required for making a cloak, the one shown represents a very high value.

The entrance to the Maori Tower is flanked by two wall-cases with



GENERAL VIEW OF THE PHILIPPINE HALL

Australian material. There is a good series of boomerangs, and the very crude stone tools and weapons of the Australians are well represented.

The great boulder of jade, from New Zealand, supports the figure of a Maori warrior in an attitude of defiance, and in the room at his back is a fine series of dried, tattooed heads, gruesome relics of the time when Maori warriors preserved the heads of their vanquished enemies.

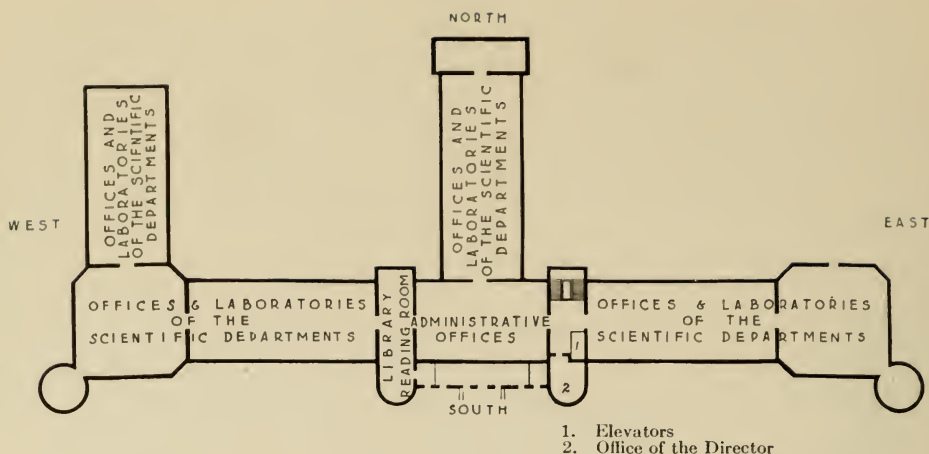
WEST WING

COLLECTIONS FROM THE PHILIPPINES

The hall due north beyond the Hall of the Pacific Islands is devoted to a collection from the Philippine Islands. The installation here, as in the African hall, is geographical. The specimens of wood along the walls are Philippine woods. The palm leaf mats above the windows around the hall are in some cases very beautiful. The brasswork, boar-bristle tooth brushes, necklaces, shell bracelets, knives, spears, bead-ornamented combs, medicines, guitars, horse accoutrements evidence superior workmanship. These people present a higher civilization than their South Sea Island neighbors. The exhibit of clothing distinctive of each tribe is very complete. The model at the entrance depicts a woman weaving a garment similar to some of those seen in the cases. The house in the tree at the end of the room, a life-size copy of a tree-house such as the Lake Lanao Moros build, will remind many visitors of the Swiss Family Robinson.

Living Tribes
of the
Philippine
Islands

[Return to the elevators.]



FIFTH FLOOR

The fifth floor is given over to the administrative offices, the offices and laboratories of the scientific departments and the library which contains some 70,000 volumes on natural history, anthropology and travel.

The reading room of the library is located in the west corridor and, with the exception of Sundays and holidays, is open free daily, from 9 A. M. to 5 P. M., to all who may wish to consult the books. Besides the current issues of the more important periodicals, it contains the more general works of reference, while other volumes will, upon application to the librarian, be furnished to those who wish to consult them.

On this floor, too, are the workrooms of the Department of Vertebrate Palæontology, where the skeletons of fossil animals are prepared and mounted, and the laboratory where are made the beautiful models of invertebrates.

These, like the other laboratories, are of necessity not open to the public.

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