

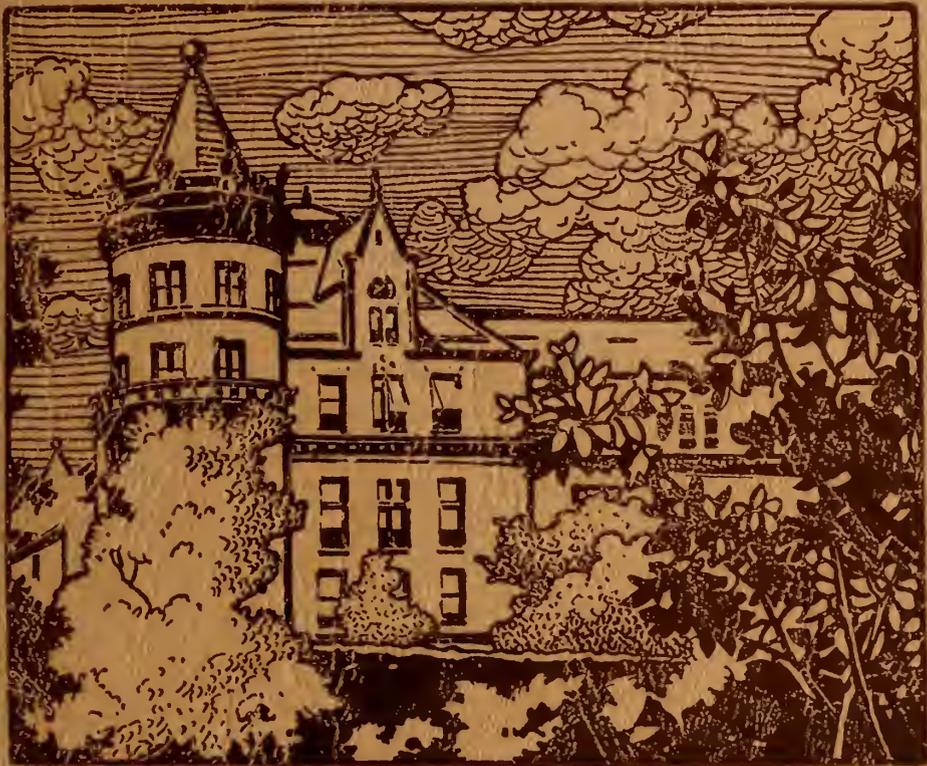
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GENERAL GUIDE ^{TO} THE EXHIBITION HALLS

BY FREDERIC A. LUCAS

Revised by Members of the Staff



NINETEENTH EDITION

THE AMERICAN MUSEUM OF NATURAL HISTORY

NEW YORK, N. Y.

1934

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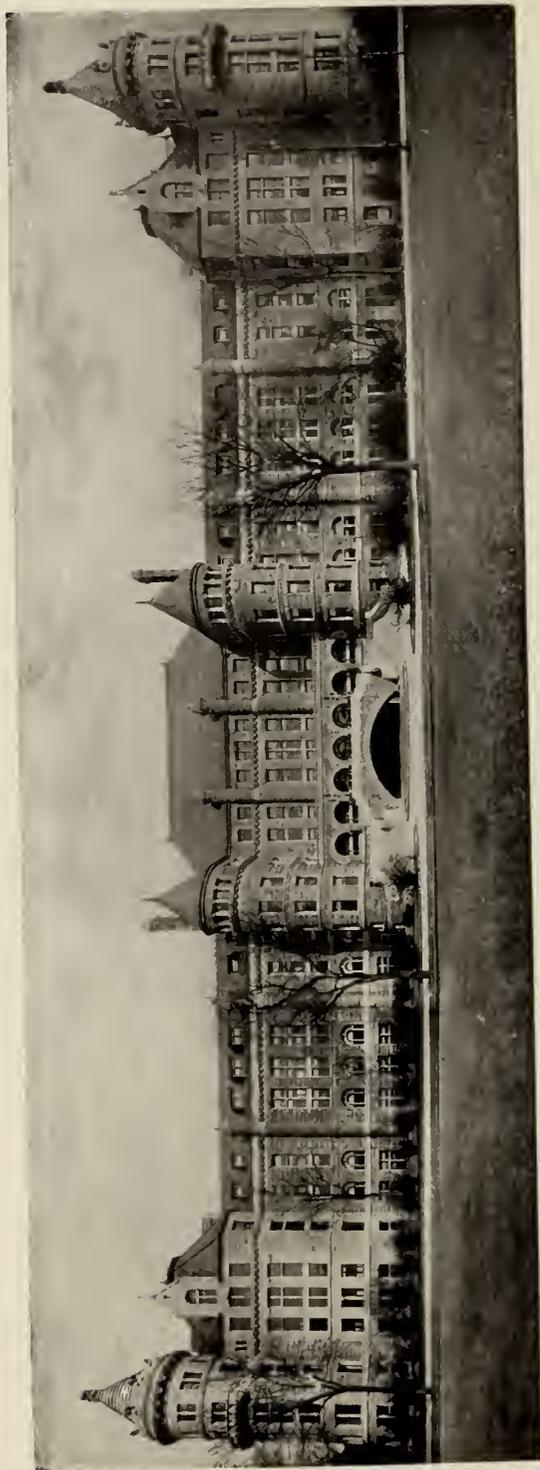
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THE AMERICAN MUSEUM OF NATURAL HISTORY

South Façade, facing Seventy-seventh Street

The cornerstone of the Museum, which is intended to occupy all of Manhattan Square, was laid by President Grant in 1874. The material of the building is red granite. The portion completed is about one-half of the Museum as planned, and each façade is to be, like the present, 710 feet long, the most important architecturally to be that fronting Central Park West, which will include the Roosevelt Memorial, erected by the State of New York.

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

BY

FREDERIC A. LUCAS

Revised by Members of the Museum Staff

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1934



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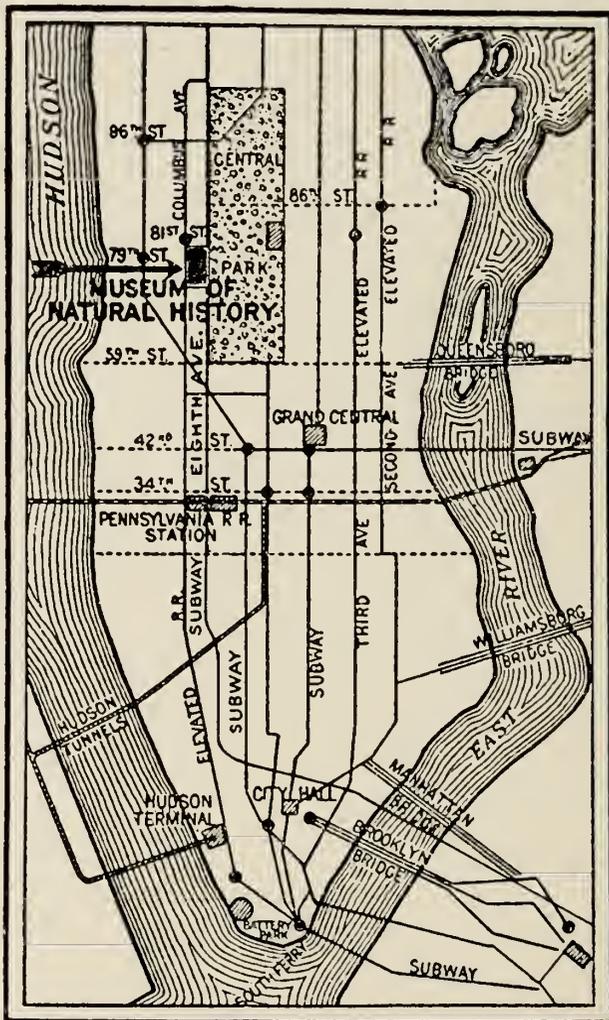
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GENERAL INFORMATION

HOW TO REACH THE MUSEUM

The Museum is located at 77th Street, from Columbus Avenue to Central Park West. It is open free every day in the year: on weekdays, including holidays, from 9 A.M. to 5 P.M., on Sundays from 1 to 5 P.M.



The Museum may be reached as follows:

By Surface cars—8th Avenue or Columbus Avenue (77th Street).

By Elevated trains—6th or 9th Avenue (81st St. Station).

By Subway—8th Avenue (81st St. Station), Museum Station.

7th Avenue (79th St. Station).

Lexington Avenue (77th St. Station). Crosstown bus may be used from E.

79th Street, directly to Columbus Avenue and 81st Street, just north of the Museum.

The main entrance is on 77th Street.

Telephone: ENdicott 2—8500.

CHECKING AND INFORMATION BOOTH

At the left, as one enters from Seventy-seventh Street, is the Checking and Information Booth, near the office of the Superintendent of Buildings. Coats and packages may be left here, and information may be obtained as to the location of halls in the building. Wheel chairs for children and adults are available free of charge.

EDUCATION BUREAU

At the right of the entrance is the Education Bureau, for the registration of teachers and students desiring guidance through the building by Museum instructors. Information concerning the exhibits or lectures may also be obtained here.

LECTURES, PUBLICATIONS, SALES BOOTH

At the right as one enters Memorial Hall is an Information and Sales Booth, where post cards, guide leaflets and other Museum publications are sold. Here may be obtained free of charge announcements of the lectures and meetings of societies held at the Museum.

Copies of publications germane to the work of the Museum are displayed on table cases in Memorial Hall, near the Sales Booth.

BULLETIN BOARD

At the right of Memorial Hall, in the East Corridor, opposite the Elevators, is a Bulletin Board displaying programs of lectures and meetings. On the west wall of this Corridor is a map showing the locations of expeditions in the field.

NOTE

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. Thus discrepancies may be found between the actual arrangement of the specimens and that noted in the GUIDE. In some cases further information may be obtained from the GUIDE LEAFLETS, which describe exhibits of special interest. See list of Popular Publications, page 142, also obtainable at the Publications Sales Booth, first floor, or at the Museum Library, fifth floor.

SKETCHING AND PHOTOGRAPHING

No permit is necessary for drawing from specimens on exhibition. Chairs may be had on application to the attendant. In case the light is poor apply to the attendant. (Sunlight is not allowed to shine on specimens on account of the injury it causes.)

Permission to photograph specimens should be obtained from the Director.

GUIDING

Free Service: This is offered to public schools and similar educational institutions and to Members of the Museum and their friends upon presentation of Members' inscribed tickets or complimentary tickets given to friends by Members. In order to secure a guide, an appointment should be made in advance. Please state the day and hour desired, the number to be guided, and any special halls to be seen.

For appointments call ENdicott 2-8500, Extensions 174, 180, or 60.

Groups for the general public are specially conducted on Wednesdays and Fridays at 11 A.M. and 3 P.M., throughout the year, and on Saturdays at 11 A.M. and 3:30 P.M., excepting during June, July and August.

Paid Service: This is provided for individuals, clubs or similar institutions not Members of the Museum. *Fee:* 25 cents per hour for each person in a group. Minimum charge for guiding \$1.00 per hour. Groups of 15 from private schools may make special arrangements for guiding at the rate of \$2.50 per hour.

RESTAURANT

Adjoining the Birds of the World Hall (Second Floor, South Pavilion) is the Restaurant, which is operated as a Museum department, for the convenience of visitors to the Museum, under the efficient direction of a dietitian-manager, and is open from 11:00 A.M. to 4:30 P.M. every day excepting Sunday.

CAFETERIA FOR SCHOOL CHILDREN

A cafeteria in the School Service Building caters especially to school children and their teachers.

MEMBERSHIP

Through its explorations, The American Museum of Natural History is bringing together rare and valuable natural history collections from all parts of the world. Through its exhibition halls, its lectures, its work with school children and its publications, the Museum is making these wonders of nature easily accessible. The growth of this work is in large measure dependent upon the contributions of friends. Membership receipts are applied directly to these purposes. There are now more than eleven thousand members, who believe that the Museum is doing a useful service to science and to education, and are contributing to this work.

The Trustees invite you to lend your support by becoming a Member.

Membership blanks may be obtained at the Education Bureau or Sales Booth, or from the boxes near the elevators.

Memberships may start at any time and will continue for a full year's period.

The various Classes of Membership are:

Associate Members	(annually)	\$3
Annual Members	(annually)	10
Sustaining Members	(annually)	25
Life Members		200
Fellows		500
Patrons		1,000
Associate Benefactors		10,000
Associate Founders		25,000
Benefactors		50,000
Endowment Members		100,000

Associate Members of The American Museum of Natural History enjoy the following privileges:

Current issues of NATURAL HISTORY—a popular illustrated magazine of science, travel, exploration and discovery, published bimonthly, the volume beginning in January. (The dues for membership in the American Museum include a subscription to NATURAL HISTORY, the Journal of the Museum.)

A copy of the President's Annual Report on request.

An Annual Pass admitting to the Members' Room. This large tower room on the third floor of the building, open every day in the year, is given over exclusively to Members, and is equipped with every comfort for rest, reading and correspondence.

Two Complimentary Tickets admitting to the Members' Room for distribution by Members to their friends.

The services of an Instructor for guidance when visiting the Museum.

In addition to these privileges, Members of the higher classes, to which all friends of the Museum are eligible, enjoy the following:

An Annual Pass admitting the Member and friends accompanying him to the Reserved Seat Section of the auditorium at Lectures for Members.

Two Single Admission Course Tickets to Spring and Autumn Series of Lectures for Members, to distribute to friends.

Two Single Admission Course Tickets to Spring and Autumn Series of Lectures for the Children of Members.

Current numbers of all *Guide Leaflets*, on request.

THE HISTORY AND WORK OF THE MUSEUM

Sixty-five years of public and scientific service have won for the American Museum of Natural History a position of recognized importance in the educational and scientific life of the nation and in the progress of civilization throughout the world. With every passing year the influence of the Museum widens, as is witnessed by the increasing numbers of visitors who daily enter its halls without the payment of any admission fee whatever.

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 **History** the study of Natural Science; of advancing the general knowledge of kindred subjects, and to that end of furnishing popular instruction. For eight years its home was in the Arsenal in Central Park, during which time many important collections were secured.

The cornerstone of the present building in Manhattan Square was laid in 1874 by President U. S. Grant; in 1877 the first section (South Central Wing) was completed, and on December 22, 1877, the Museum was formally opened by President R. B. Hayes.

In 1880 the educational work with the schools was inaugurated by Professor Albert S. Bickmore.

In 1893 the Museum was opened to the public on Sundays, and in 1907 it was opened free to the public every day in the year.

The Museum building is one of the largest municipal structures in the City, and has cost to date approximately \$16,000,000. The South Façade is 710 feet in length; the total floor area is about twenty-two acres. The structure is designed when completed 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 **Administration and Support** 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.

The Museum is under the control of a self-perpetuating Board of Trustees, which has the entire direction of 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 contributed by the Trustees, Members and other friends.

The interest of the Endowment Fund, which includes the munificent bequest of Mr. and Mrs. Morris K. Jesup (1909-1917), may be used for additions to the collections, research, and for publication. It cannot be used for the care or repair of the building, construction of cases or other maintenance work for which the City provides.

The Membership Fund, derived from the subscriptions of Members, may be devoted to any purpose and is of particular importance in promoting the educational work and growth 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, as for example the Morgan collection of gems and the Juilliard collection of ancient Peruvian pottery and textiles.

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, constitute 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 as Director of the British Museum of Natural History stated that:

"The purposes of a great national museum of natural history are: (1) 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 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."

As the Museum is emphatically for the people, special attention is given to making the exhibits attractive and interesting as well as instructive.

While The American Museum of Natural History cannot claim to have originated the idea of displaying animals amid their natural surroundings, it was the first large museum in this country to adopt this method, which it has since carried out on a large scale in the well-known habitat groups. How it has been developed, the visitor may judge by comparing the group of Robins and the Orizaba, Wolf or Hopi Groups.

In this Museum were also developed the methods of preparing and mounting the skeletons of extinct animals that have resulted in such mounts as *Brontosaurus* and *Tyrannosaurus*, and the series showing the development of the horse, so that they might be something more than an assemblage of uninteresting bones.

The Museum maintains exhibits "for the edification of the public." The collections are brought together through gifts, exchanges with other institutions, through purchases and by means of explorations in various parts of the world.

The educational work performed by these specimens and their accompanying labels is supplemented 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; also courses of Science Stories are given on Saturday mornings for the children of members. Other series, under the direction of the Department of Education of the Museum, are given for the children of the public schools, and for students of the high schools and colleges. There are also courses carrying college and university credit. Lectures for the blind are provided for by the Jonathan Thorne Memorial Fund.

Scientific Societies meet at the Museum and from time to time offer lectures of general interest.

Radio talks are given in connection with some of the activities of the Museum.

The publications of the Museum are noted on pages 135 and 142.

STATISTICS OF NUMBERS REACHED BY THE MUSEUM AND ITS EXTENSION EDUCATIONAL SYSTEM

	1929	1930	1931 *	1932	1933
Lectures to School Children and classes visiting the Museum for Study . . .	157,168	214,153	226,552	220,482	159,538
Meetings of Scientific Societies and Other Meetings and Lectures	45,936	56,640	20,330	23,042	18,528
Total	203,104	270,793	246,882	243,524	178,066
Attendance in Exhibition Halls	712,529	876,601	882,309	789,741	924,030
Total attendance for all	915,633	1,147,394	1,129,191	1,033,265	1,102,096
Lectures to Pupils in the Schools	26,456	19,512	8,248	23,006	31,818
Number reached by Motion Picture Service	1,725,865	3,764,505	7,423,708	10,458,181	9,012,628
Number reached by Lantern Slide Service	8,550,181	15,588,403	17,392,790	17,019,882	17,014,690
Number reached by Circulating Collections	1,857,729	3,194,647	2,567,537	3,816,863	4,775,176
Bear Mountain Nature Trails			283,000	300,000	350,000
Grand Total	13,075,864	23,714,461	28,804,474	32,651,197	32,286,408



BLIND CHILDREN STUDING NATURAL HISTORY

Only through their sense of touch are the blind able to "see" the objects in the world around them. At the American Museum, children of the New York City Schools who are so handicapped have the opportunity, under sympathetic instruction, to handle and learn all about animals, birds, flowers, and minerals.

ENTRANCE ARCHWAY

Under the arch on Seventy-seventh Street, before entering the Museum, one notices the "Bench Mark" established by the U. S. Geological Survey in 1911, on which are 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 State. The stream carried pebbles that, whirled around 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 Kelley 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 north-eastern part of North America during the Glacial epoch.

KEY TO EXHIBITION HALLS

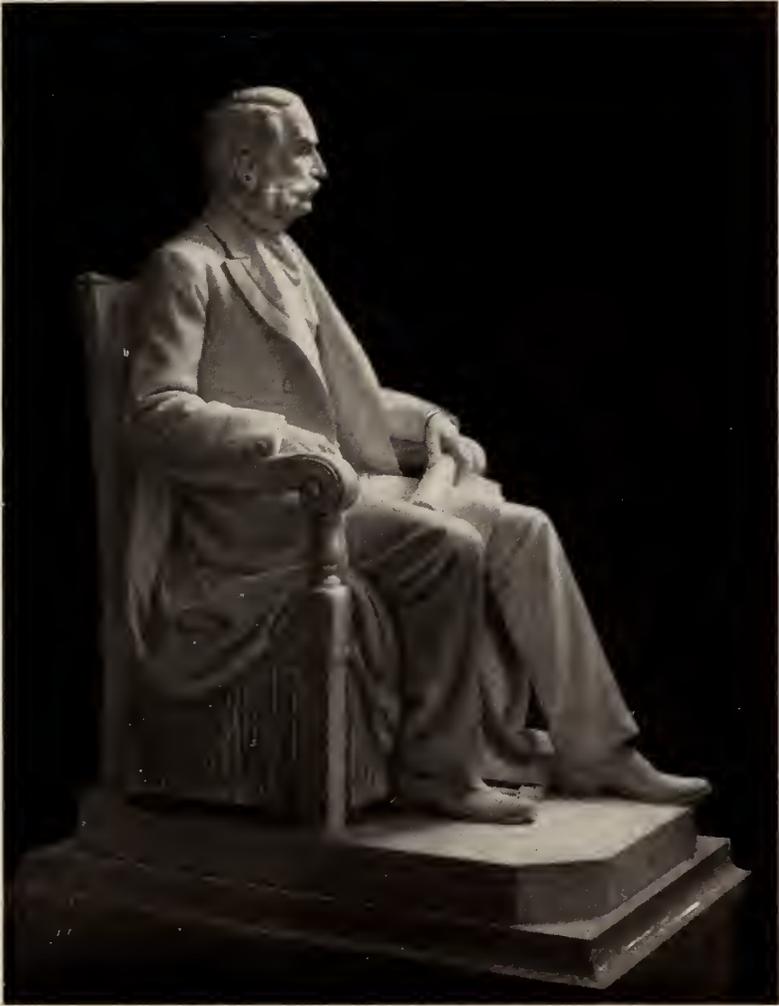
See Floor Plan on Page 18

	<i>Location in Museum</i>	<i>Page</i>
Administrative Offices.....	Fifth Floor, South Pavilion.....	134
Africa, Collections from.....	Third Floor, West Wing.....	106
Apes and Monkeys.....	Third Floor, South Pavilion.....	84
Asia, Collections from.....	Third Floor, Southwest Pavilion.....	105
Asia, Central.....	Fourth Floor, Southeast Pavilion.....	115
Asia, South, Mammals.....	Second Floor, East Wing.....	69
Astronomy.....	First Floor, West Corridor.....	48
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Auduboniana.....	Third Floor, West Corridor.....	101
Birds, Local.....	Second Floor, West Corridor.....	73
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Birds of the World (Faunal Groups).....	Second Floor, South Pavilion.....	59
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Darwin Hall.....	First Floor, Southeast Pavilion.....	20
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Education Bureau.....	First Floor, South Corridor.....	7
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Eskimo Collection.....	First Floor, North Corridor.....	40
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Fossil Mammals (Horses, Camels, etc.).....	Fourth Floor, Southeast Wing.....	111
Fossil Mammals (Mastodons).....	Fourth Floor, South Pavilion.....	109
Fossil Reptiles.....	Fourth Floor, East Wing.....	116
Gems and Precious Stones.....	Fourth Floor, Southwest Wing.....	129
Geology, Historical.....	Fourth Floor, South Central Wing.....	119
Horse, Evolution of.....	Fourth Floor, Southeast Wing.....	111
Horse, under Domestication.....	Fourth Floor, West Corridor.....	127
Indians of South America.....	Second Floor, West Wing.....	80
Indians of the North Pacific Coast.....	First Floor, South Central Wing.....	37
Indians of the Plains.....	First Floor, Southwest Pavilion.....	51
Indians of the Southwest.....	First Floor, West Wing.....	54
Indians of the Woodlands.....	First Floor, Southwest Wing, Southwest Tower.....	49
Information and Checking Bureau.....	First Floor, South Corridor.....	7
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Invertebrates.....	First Floor, Southeast Pavilion, Southeast Tower.....	20
Jade.....	Fourth Floor, Southwest Tower.....	132
Japan.....	Third Floor, Southwest Tower.....	106
Library.....	Fifth Floor, West Corridor.....	134
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Mammals of the World (Synoptic Series).....	Third Floor, Southeast Wing.....	86
Mammals, South Asiatic.....	Second Floor, East Wing.....	69
Man, Early.....	Fourth Floor, South Pavilion.....	109
Man, Natural History.....	Third Floor, Southwest Wing.....	102
Man, Prehistoric.....	Second Floor, Southwest Pavilion.....	79
Members' Room.....	Third Floor, East Corridor.....	86
Memorial Hall.....	First Floor, South Pavilion.....	18
Meteorites.....	First Floor, South Pavilion.....	18
Mexico.....	Second Floor, Southwest Wing.....	74
Minerals.....	Fourth Floor, Southwest Wing.....	129
Ocean Life Hall.....	First Floor, Southeast Court.....	31
Pacific Islands Collections.....	Fourth Floor, Southwest Pavilion.....	131
Peru.....	Second Floor, West Wing.....	80

KEY TO EXHIBITION HALLS

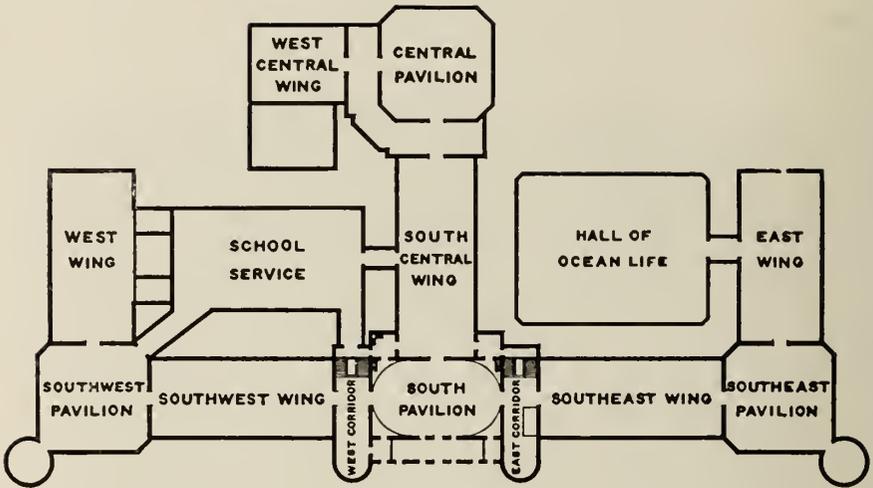
	<i>Location in Museum</i>	<i>Page</i>
Philippine Collections	Fourth Floor, West Wing	133
Public Health	First Floor, West Central Wing	41
Publications Booth	First Floor, South Pavilion	7
Reptiles and Amphibians	Third Floor, East Wing	90
Restaurant	Second Floor, South Corridor	59
Shells	First Floor, Southeast Court	34
Whales	First Floor, Southeast Court	31
Woods of North America	First Floor, Southeast Wing	20

The halls are named according to the position they will have in the completed Museum building, which will consist of four long facades 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 facade (the only facade completed) becomes the "southeast pavilion."



STATUE OF MORRIS K. JESUP IN MEMORIAL HALL

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



FIRST FLOOR

SOUTH CORRIDOR

MEMORIAL HALL

From the lobby (South Corridor) the visitor enters Memorial Hall and faces the statue of Morris K. Jesup, a Founder, Trustee and Benefactor of the Museum, and for twenty-seven years its President.

In niches around the wall are busts of noteworthy pioneers of Science in America, and circling the hall is a portion of the collection of meteorites, comprising the larger examples, among them Alnighito, weighing 36.5 tons, the largest meteorite in any museum, brought from Greenland by Peary in 1897, and Willamette, weight 15 tons, the largest meteorite found in the United States, and the most curious.

EAST CORRIDOR

Leaving the statue on the left, and going east, the visitor enters the East Corridor. Here are the sledges that with Peary (1906) and Amundsen (1911) reached the North and South Poles, respectively, also photographs and objects illustrative of the Amundsen-Ellsworth expeditions of 1925 and 1926. The maps of the North and South Polar Regions show the routes of various explorers and the airplane and airship flights in polar regions from 1925 to 1934.

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.



AHNIGHTO METEORITE

The largest meteorite in any museum, weight 36.5 tons. Brought from Greenland by Peary in 1897.
Gift of Mrs. Morris K. Jesup.

The Elevators start at intervals from the East Corridor, at the entrance to the hall of Trees of North America. The visitor may either take an elevator to the fourth floor and visit the halls as he descends, or choose his hall from the *General Guide* or from the *Directory* opposite the elevators.

SOUTHEAST WING

JESUP COLLECTION OF TREES OF NORTH AMERICA

To the east of the elevators is the *Hall of Trees of North America*, containing a nearly complete collection of the native trees north of Mexico, presented 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, Massachusetts, and in front a bust of Charles Sprague Sargent under whose direction the collection was brought together. At the farther end is a bust of John Muir, by Malvina Hoffman, presented by Mrs. E. H. Harriman.

In the center of the hall is the trunk of a fossil tree 45 feet long and several million years old.

To the left is a section of one of the Big Trees of California, sixteen feet in diameter and 1341 years old. (See *Guide Leaflet* No. 42.) It began its growth in the year 550, so that it was nearly a thousand years old before America was discovered. The label, illustrating the conclusions reached by Ellsworth Huntington as the result of long study, shows how the climate of the past is recorded by the trees, and how great historical events are related to great changes in climate.

The other specimens in the hall show cross, longitudinal and oblique sections of the wood finished and unfinished, and the labels 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 plans in the first case on either side of the hall. The reproductions of the flowers, leaves and fruits are instructive; this work is done in the Museum laboratories.

(See *Guide Leaflet* No. 42, "The Big Tree and Its Story" and Leaflet 54, "Plants of Wax.")

SOUTHEAST PAVILION

INVERTEBRATES

At the extreme east is *Darwin Hall of Evolution*, 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 Darwin by William Conper, presented by the New York Academy of Sciences on the occasion of the Darwin centenary in 1909.



MAGNOLIA 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 reproductions of leaves, flowers and fruits accurately copied from life in the Museum laboratories. Most noteworthy among them is the magnolia shown here, but there are many beautiful examples of spring flowers and autumn foliage.

FAMILY TREE OF ANIMALS

In the first upright case at the left is a Family Tree of the Animal Kingdom, each class being at present represented by a color sketch, the branches showing the relationships of the various classes.

SYNOPTIC SERIES

The exhibits in the succeeding upright cases comprise examples of the various groups or orders included in the Classes shown on the Family Tree. Passing around the hall from left to right, it will be noted that the progress of evolution is illustrated from the lowest forms, the Protozoa, to the highest, the Primates, which include man. The distinctive characters of each group are fully described on the alcove and case labels. Many of the animals are represented by skilfully prepared models in glass and wax showing the animal many times enlarged.

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 **Alcove 1 Protozoa** the ocean bottom in many localities is covered with them. The exhibits in this alcove are mainly models, some of which represent Protozoa enlarged more than a thousand diameters.

Sponges are principally of three kinds—those with skeletons or supporting structures of lime, those with structures, of silica (i.e., flint) and those with skeletons of horny fiber. The sponges of **Alcove 2 Sponges** commerce belong to the latter class. In the dry specimens exhibited, the skeleton only can be seen, the living tissue having been removed. Sponges range in size from the tiny *Grantia* of the New England coast to the gigantic “Neptune’s goblets” found in the eastern seas.

In Alcove 3 are shown coral animals and their relatives: among them plantlike hydroids which often are mistaken for sea moss, but which **Alcove 3 Polyps** really are a series of polyps living in a colony; jellyfishes with their umbrella-shaped bodies and long, streaming tentacles; brilliantly 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. Especially noteworthy, in the northwest corner of the hall, is a reproduction in glass of a Portuguese **Coral Tower** Man-of-War, which is really a colony of many animals attached to one another and specialized for various functions. A comprehensive synoptic series of stony corals is exhibited in the circular Tower alcove at the southeast corner of the hall.

The best known species in this group include the tapeworms, whose development and structure are shown by models in the left-hand alcove case. The less familiar free-living flatworms, which inhabit both salt and fresh water, are shown on an enlarged scale by models.

The roundworms are parasitic, since they live in the digestive canal of mammals. The most familiar is the common roundworm or stomach worm, *Ascaris*, of which an enlarged scale model is exhibited, showing the internal structure.

[*Note for teachers and students.*—Some of the models in each alcove are *anatomical*, i.e., so constructed as to show the internal organs of typical members of each group. In such cases, arbitrary colors chosen to designate the various systems of organs are adhered to consistently throughout the series.]

The minute wheel animalcules, otherwise called rotifers, comprise many exquisite and grotesque forms, some of which construct tubes of a 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 found mainly in fresh water. See window group.

The sea-mats are minute, colonial animals of plant-like growth, often occurring as encrustations on shells and seaweed. A few species also occur in fresh water. The lamp-shells shown in this alcove superficially resemble clams, but by structure are more closely related to the sea-mats.

Alcove 8 is occupied by the sea-stars, brittle stars, sea-urchins, sea-cucumbers and sea-lilies. The sea-star is the pest of the oyster beds, where it feeds on oysters and destroys them in large numbers. The brittle stars are so called because of their habit of dropping off one or more arms when handled or attacked. These, however, are later renewed.

The annulates, 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 bodily structures of these annulates are often very beautiful and interesting.

Arthropods include the familiar crabs, lobsters, myriapods, insects, spiders and their relatives. The number of existing species in this group is greater than that of all the rest of the animal kingdom. No other group comprises so many species useful or harmful to man. On the wall are the two largest specimens of



A TYPICAL ROCK TIDE-POOL ON THE

Represented by a group



NORTH SHORE OF NEW ENGLAND

in the Darwin Hall

lobster that have ever been taken. They weighed when alive thirty-one **Crustaceans and Insects** and thirty-four pounds, respectively. The largest of the arthropods is the giant crab of Japan, which, like that placed on the wall, may have a spread of about ten feet.

A series of models of insect heads, carefully wrought in wax and glass, shows, greatly enlarged, their comparative anatomy.

The Mollusks are second to the arthropods in the diversity and vast number of forms which they embrace, including marine, fresh-water **Alcove 11 Mollusks** 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 **Models of Clam and Oyster** center case show the anatomy of this species. A large collection of mollusks is shown in the Hall of Ocean Life, page 34.

Vertebrates include the largest, most powerful and most intelligent of animals, the group culminating in man. Among the ancestral forms are the Ascidians, or Sea-squirts, an enlarged model **Alcove 12 Chordates Including Vertebrates** of which is shown in the central case, while others are seen among the animals on the wharf-piles in the window group. Other models in a case in the front of the hall show the development of the egg of typical vertebrates.

WINDOW GROUPS

In several of the alcove windows are habitat groups of invertebrates illustrating the natural history of the commoner and more typical forms, and showing how the kinds or species of animals found in any locality vary with the character of the bottom or of the surroundings.

In the Annulate Alcove is shown the **Marine Worm Group** Marine Worm Group, reproducing these animals with their associates in their natural surroundings, as seen in the harbor of Woods Hole, Massachusetts. 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.

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. In the foreground at the **Shore Mollusk Group** 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

starfish, while crabs and mollusks of various species are pursuing their usual activities.

The window group in the Vertebrate Alcove shows the submerged piles of an old wharf at Vineyard Haven, Mass., covered with flower-
Wharf Pile like colonies of stationary animals. Among these are sea-
Group anemones, tube-building worms, hydroids, mussels, sea-
 mats and several kinds of ascidians or sea-squirts. The latter are
 primitive members of the Chordate group which includes the vertebrates.

In the southeast corner of the hall, a window group shows the
 animals and plants of a rock tide-pool, the "Agassiz Cave," at Nahant,
Rock Massachusetts. The falling tide has left a pool in a
Tide-Pool rocky basin, sheltered within which is a community of
Group sea-anemones, sea-stars, corals, sponges, hydroids and
 other animals living in the midst of a gorgeous sea-garden of marine
 plants such as are common on the northern New England coast. Through
 the arch of the natural bridge may be seen a curious rock formation
 known as "Pulpit Rock."

At the end of the Arthropod Alcove, a group shows an incident in the
 struggle for existence among Crustacea in their natural surroundings on
 the sandy bottom of Vineyard Sound, Massachusetts. Here
Sound is a den of lobsters in a crevice beneath the seaweed-
Bottom covered granite boulders forming the reef known as the
Group Devil's Bridge. In the sand near by the Lady Crabs are accustomed to
 burrow to escape their lobster enemies. An unwary crab has ventured
 out to hunt for shrimp and is immediately pounced upon by one of the
 vigilant and voracious lobsters.

Another group represents two square inches of sea bottom as though
 enlarged under a microscope to an area four feet square. The front of the
Bryozoa case is built to represent a huge magnifying glass, through
Group which the visitor sees marine plants magnified to tree-like
 proportions, encrusted with colonies of Bryozoa or "sea-mats," com-
 posed of thousands of individuals, each of which builds a "house" or
 shell of graceful, vase-like form; hydroids, giving rise to tiny "medu-
 sæ" or jellyfish; and even protozoa are brought within the range of
 vision. Associated animals, such as the flower-like, tube-building worms
 and sea spiders, are enlarged to grotesque proportions. This group illus-
 trates well the prolific and varied jungle worlds, found even in the
 smallest areas of the sea-bottom, the existence of which, because of their
 microscopic size, is not suspected by casual observers.



FLOWER-LIKE ROTIFERS SETTLED IN A NOOK AMONG THE WATER PLANTS
A Detail from the Rotifer Group

A companion exhibit represents a cubic half-inch of a fresh-water pond bottom enlarged one hundred diameters or cubically a million **Rotifer Group** times, thus transforming a minute area into a towering aquatic forest peopled by myriads of strange creatures ordinarily invisible to the naked eye. The group centers about a spray of bladderwort which is provided with bladder-shaped animal traps for the capture of the microscopic rotifers, protozoans, water fleas and insect larvæ upon which this strange carnivorous plant feeds. The living creatures most abundantly represented in the group are the rotifers, top-shaped animals with vibrating crowns of hair-like cilia which move in such a fashion as to give the impression of a rotating wheel, hence the animals are often called "wheel-animalcules." Many rotifers are free-swimming, while others remain stationary and build clusters of beautiful vase-shaped "houses" from the openings of which are protruded their flower-like heads.

BIOLOGIC EXHIBITS

Other exhibits illustrate certain facts made clear by Darwin and those who came after him. On the left, facing the entrance, variation **Variation Under Domestication** 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.

On the right, several exhibits will show variation in nature. An **Variation in Nature** example of this is the variation among the finches of the genus *Geospiza* in the Galapagos Islands.

Other examples show by means of a series of mollusks the range of color variation within a single species of West Indian Sun Shell, variation of sculpture within a single genus of land snail, and variations about the normal type of the common scallop.

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

The simpler features of the laws of heredity as elucidated by Mendel **Heredity** and his followers are illustrated by the inheritance of seed-coat color in the common pea, the color of sweet peas, and the coat-color of rats.

Here also four large models show the mosquito, which is the active **Models of the Malaria Mosquito** agent in the spread of malaria, and stages in its development enlarged seventy-five diameters or in volume four hundred thousand times the natural size.

The associations of marine life found in the Bahamas are represented by several small groups in the center of the hall.



THE STRUGGLE FOR EXISTENCE AT THE SEA BOTTOM

An unwary lady crab (*Ovalipes ocellatus*) has ventured out of the sand, where it usually lies buried up to its projecting eyes and feelers, and is immediately pounced upon by a lurking lobster. The crab frantically endeavors to escape by vigorously paddling its oar-shaped hind limbs. A detail from the Sound Bottom Group.

EAST WING

HALL OF FISHES

On entering the *Hall of Fishes* one faces a group of sharks, sweeping down upon a helpless loggerhead turtle. The large decorative panel **The Sea Rovers** on the right illustrates the principal grand divisions of fish life and their history in geologic time. The decorative panel at the left represents successive stages in the development of the Australian Lungfish, *Neoceratodus forsteri*, from the fertilized egg to the adult.

The Systematic Exhibit includes a representative series of fishes, from the lowly "cartilage fishes," including the sharks and rays, to the **Systematic Exhibit** highest or most complexly constructed bony fishes. Noteworthy in this series are the "Fishes with Limbs and Lungs," the terrible hag fishes, the graceful skates and rays, the hammer-



THE COUNTRY OF PERPETUAL NIGHT
From Group in the Hall of Fishes

head shark, and the thresher shark. Then follow a series of mounted groups of "ganoids," including the sturgeons, spoonbills, bony gars, bowfins, all of exceptional scientific interest, since they are "living fossils," or descendants of the now extinct fishes of earlier geologic times. In the alcoves and wall cases on the right, or east side, the visitor will find many curious forms, such as the giant catfishes, the handsome rooster fish, the brilliant parrot wrasses, and butterfly fishes.

At the north end of the Fish Hall is the exhibit of Big Game Fishes, including many of great size taken with rod and line by Zane Grey.

Big Game Fishes The huge ocean sunfish, caught by him with harpoon and gaff, weighed nearly a ton. The centerpiece of the exhibit is the mounted sailfish, shown in the act of leaping from the water in a desperate effort to shake the hook from its jaws.

The walls of the inner enclosure represent tropical reef waters; against them in the center hangs the giant Manta, or Devilfish, measuring 17 feet, 3 inches across the "wings." Over the small inner doorway is mounted a model of the rare Oarfish, and on either side are various pictures and specimens taken on the "Areturus" Expedition of 1925.

The Deep Sea Fishes form a special exhibit in an inner room. Here in the semi-darkness we view some of the hobgoblins of the ocean depths—many of them covered with jewels of phosphorescent light.

On either side of the entrance to the inner enclosure is the Biological Exhibit. One case considers the fish as a machine: its streamline form, its main principles of construction, its locomotor machinery, and the mechanism of its jaws. Another case considers the fish as a living organism: how it grows from a single fertilized egg; interesting cases of nest building; parental care of the young, and allied topics.

SOUTHEAST COURT HALL OF OCEAN LIFE

Leading from the Hall of Fishes is the *Hall of Ocean Life* recently opened to the public (May 2, 1933). In this hall are displayed whales, porpoises, marine mammals, the great coral reef group, and shells. Although much of the space is now occupied by permanent exhibits, the final plans have not yet been fully consummated, and additions to the exhibits in the hall will be made from time to time.

Immediately upon entering, the visitor will note the large skeletons and models of whales and porpoises suspended by fine cables from the ceiling. The first large skeleton to the right (north side) is that of a Sperm Whale, the largest of the living toothed whales and the only

species of whale capable of swallowing Jonah entire. Beyond the Sperm Whale, on the same side, hangs a skeleton of the Right Whale, so called because it was the right species to hunt in contradistinction to the finback whales and others which lacked the long whale bone.

Just above these two large skeletons are found skeletons of smaller cetaceans, including several species of toothed whales, the Narwhal and the Blackfish. At the near end of this row is a model of the Pigmy Sperm Whale, a very small whale, related to the Sperm Whale and suggestive of it in appearance.

Along the south side of the hall, two more skeletons of large whales are suspended, the nearer being a Finback Whale, the other a California Gray Whale. Above them is a long row of lifelike models of porpoises ranging in species from the common dolphin and the rare river and lake dolphins to the White Whale. At the far end are two large models, one of the spectacular Narwhal with long ivory tusk (at the right), the other the Faise Killer, formerly a very rare species but in recent years appearing unexpectedly off the British Isles and the coast of South Africa, where a large number were stranded in shoal water.

Just over the entrance to the hall is the striking full-sized model of the Killer Whale with contrasting black and white markings, the wolf of the sea, a fierce predatory cetacean capable of swallowing a fur seal or a small porpoise at a gulp. Near the Killer and facing it, hangs the model of a Blackfish, like the Killer a species of giant porpoise but of a much milder disposition. Obliquely above this pair is suspended a lifelike model of a Giant Squid, one of the marine animals upon which the Sperm Whale preys.

Around the walls of the balcony are spaces for twelve mural paintings, of which nine have been completed as this guide goes to press. Along the northern side are four great paintings showing scenes typical of American Sperm whaling and titled respectively, "The Chase," "The Attack," "Towing the Carcass," and "Trying Out." On the southern wall are three canvases portraying the life of different species of whales and including "Bowhead Whale," "Finback Whale," and "Killer Whales Attacking a Gray Whale." These seven murals are the work of Mr. John P. Benson, the noted marine painter.

At the far end of the hall is the large habitat group showing a coral reef in the Bahamas. The group extends from the main floor of the hall up to the limits of the balcony ceiling and shows the multitudinous life below the surface, as well as the land, sea and sky above. This group is in the final stages of completion after many years of study and preparatory work.

At either side of the painted background of the coral reef group is a large mural showing dolphins in a running sea.

Below the level of the balcony and hanging just beyond reach from the rail at the head of the stairway is a cast of a young Sperm Whale which came into New York Harbor and eventually was held a captive in the Gowanus Canal at Brooklyn. It was brought to the Museum in the flesh.



STELLER'S SEA LION

The most striking figure in the Sea Lion Group, Hall of Ocean Life

In wall cases, table cases and A-cases around the balcony is arranged an exceptionally fine exhibit of shells with many items of unusual beauty or rarity. Several important private collections have been donated to the American Museum and are incorporated here, including the D. Jackson Steward, Jay, Crooke and Frederick A. Constable collections. One of the rarest of shells is the *Conus gloria maris*, in a small glass case at the right of the entrance, and the largest shell is

Shells

the giant clam *Tridacna*, weighing 579 pounds, to be found at the left in the small foyer as one enters from the Hall of Fishes.

On the main floor of the Hall of Ocean Life and under the overhang of the balcony are the habitat groups of marine mammals. Beginning at the northeast corner, the first of these is the group of Northern Elephant Seals, huge, ponderous mammals hauled out on the rocky beach of Guadaloupe Island, Lower California. The full-grown male of this species has a long, pendulous proboscis suggestive of an elephant's trunk. The only group on the northern side completed at this time is that of the Florida Manatee, a thick-set, homely beast but yet the origin of the mermaid myth.

In the southeast corner is a large group of Steller's Sea Lions at home on St. George Island, one of the Pribilofs. The male Sea Lions are huge, powerful seals with massive necks and shoulders.

Adjacent to the Sea Lions are found the Alaska Fur Seals on Kitovi Rookery, St. Paul's Island. Many details of the home life of these beautiful seals are to be noted in this group, which shows the vigorous dominant bulls, each with his harem of sleek, slender cows, the bachelor bulls, and the playful pups.

As on the other side of the hall, many of the spaces along the southern side are still unoccupied, but one case contains a small-scale model of the Pacific Walrus group, which will be, when completed, one of the very largest in the Museum. Back of the partition, most of the group has been finished and awaits only the background to be ready for the public.

On the floor of the hall are several cases with special exhibits. One of these is the Townsend Fur Seal, a species on the verge of extinction and only recently rediscovered after it was believed by many to have disappeared completely. Another case contains four small-scale models of whales, and the third displays several types of diving gear with full equipment of pump, telephone, etc.

At either side, at the western end of the hall, main floor, are two cases with the beautiful under-sea paintings by Mr. Zarh H. Pritchard.

A low fence shuts off the public from the western end of the hall, and behind this barricade the preparators are working upon the coral reef group. The material not yet in its proper place may be seen in various cases, and much of the equipment and data for constructing a great group may be observed within this area.

A notable addition has been made in the past year through the donation by Colonel and Mrs. Charles A. Lindbergh of the plane "Tingmis-
Lindbergh satoq" with all its equipment, which they used in flying across
Plane Bering Strait to China, and later in their exploration flights over Greenland, Iceland, the North Atlantic, Europe, the South Atlantic Ocean and South America. Probably no exploratory expeditions by air have ever been so well equipped as those conducted by Colonel and Mrs. Lindbergh, and their gifts to the Museum are proving not alone of great interest but of real educational value.

Return to the South Pavilion (Memorial Hall).

SOUTH CENTRAL WING
INDIANS OF THE NORTH
PACIFIC COAST

As the visitor passes through Memorial Hall he sees directly behind the Jesup statue a large **Haida Canoe** filled with a group of men. This stands in the entrance of a hall devoted to the Indians of the Northwest Coast. They are especially noted for their totem poles, grotesquely carved and painted. A double row of poles lines either side of the central aisle and others are on the side walls. These carvings fall into three main classes: totem poles proper which in some cases were sixty feet high, towering over the villages; house posts, four of which were the main supports of the house roofs; and grave monuments taking various forms.

In the center aisle will be found a model of a Kwakiutl village showing the type of construction of the house and the arrangement of the houses in the village, and an industrial group illustrating the household activities of the men and women.

On the walls are murals by Will S. Taylor which illustrate both the industrial and the social and religious life of the Indians of this region.

The exhibits are arranged in the same order in which the tribes are encountered in passing from the south toward the north along the coast of British Columbia and Alaska.

On the left are the collections from the Nootka living on the west coast of Vancouver Island. They are noted as hunters of whales, a hazardous occupation, especially when done without the aid of large boats. Next are the Kwakiutl, who live in the northern portion of Vancouver Island, subsisting mainly on fish and the smaller sea mammals. The devices for taking fish vary not only for each kind of fish, but in the case of salmon they are also especially adapted to the particular location in which the fish are taken. The Kwakiutl formerly devoted much of



Totem pole at Wrangel, Alaska. At the bottom is a beaver with a frog under his chin; above is a raven; and above the raven a frog, which is surmounted by a human head.



WEAVING A CHILKAT BLANKET
A mural painting by Will S. Taylor

Copyright



ESKIMO HOME SCENE

Within a snow house or "igloo," an Eskimo woman is cooking blubber over the flame from a seal-oil lamp.

the winter to dramatic ceremonies in which grotesque masks were worn. Examples of these will be found near the middle of the west side of the hall.

At the farther end the art of the Tlingit Indians of Alaska is shown in considerable detail. They are especially expert in carving in stone, bone, ivory and wood. One of the tribes of the Tlingit, the Chilkat, make blankets from the wool of the mountain goat. The end wall case is entirely devoted to the basketry of the Tlingit.

The wall case directly opposite contains carved and painted boxes and chests selected to illustrate this phase of Northwest Coast art. Passing down the east side of the hall the following peoples are represented: Haida, Tsimshian, Bella Coola, Coast Salish, Shuswap and Thompson. The two last mentioned are not Northwest Coast in culture. They live in the interior of British Columbia. Their baskets are of especial interest.

The *Auditorium*, opening from the corridor, has a seating capacity of approximately 1500, and is completely equipped with stereopticons and apparatus for projecting both silent and sound motion pictures.

Auditorium Here are given lectures to Members of the Museum; to the Children of Members; to teachers and pupils of the public schools, to students of the high and training schools, and to the public.

NORTH CORRIDOR

The Eskimo collections will be found in the adjoining hallway and corridor. Near the entrance is an Eskimo woman fishing through the ice. She has formed a windbreak with blocks of ice. The **The Eskimo** fishing 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. Just back of her stands a man about to strike a seal under the ice. In another case will be found an Eskimo woman cooking in the interior of a snow hut or igloo lined with sealskin. She is using a stone lamp filled with seal oil, which feeds the flame over which the meal is being prepared. In this section will be found collections, obtained by the Stefansson-Anderson expedition, from the Eskimo of Coronation Gulf, some of whom had never seen a white man. In other cases are shown the clothing of the Eskimo, the many ingeniously made implements, and many finely carved and engraved ivory objects from the collections made by Peary, Comer and MacMillan.

The farther portion of the corridor is occupied by the collection of building stones, which include marble, sandstone, limestone, dolomite, **Building Stones** quartzite, slate, granite, diabase, soapstone, etc. There are also exhibits illustrating the products derived from coal; minerals and ores from Broken Hill, Australia; a collection of gypsum;

typical American and Manhattan Island rocks, a local peat collection and a varied assortment of marbles from Italy, Alaska, Canada and the United States. Those from New York and Vermont have large representations. There are also present a number of large specimens representing various phases of general geology, and a few of the meteorites.



THE STRUCTURE OF METEORITES

A section of Brenham, siderite (nickel iron) on the left, passing into siderolite (iron and stone) on the right. Note the broad Widmanstätten lines

WEST CENTRAL WING

HALL OF BIOLOGICAL PRINCIPLES AND APPLIED BIOLOGY

FOOD NEEDS AND FOOD ECONOMICS

Commencing at the south side of this wing, the Food Exhibit presents in graphic form the needs of the human body and shows how these needs can be met economically. The first case on the left shows the chemical composition of the human body as represented by a man weighing 154 pounds. Special emphasis is laid on the need for mineral salts and for the indispensable elements called vitamins, and models illustrate the contribution made by the commoner foods to the daily need of energy.

The composition of certain common foods as regards protein, carbohydrates, fat, mineral salts, water and refuse is graphically represented. A special series of models shows the size of 100-calorie portions of the

**Scope of
Food
Exhibit**

more important foodstuffs, classified by costs, and another exhibit stresses the necessity of eating the right quality of foods as well as the proper quantity.

In one case the problems of the world's food supply, its production and distribution are set forth in models and charts. The **World Problem of Food Supply** importance of the rice, wheat and other grain crops is emphasized and the relation of cereal production to national prosperity is brought out.

In order to make the exhibit as practical as possible, an adequate daily dietary for an individual is shown, based on a moderate income. Models illustrate the proper types of marketing of food and the relative importance of the cost of food as a factor in the family budget.

The balance of this wing is devoted to exhibits dealing with Water Supply; Sewage Disposal; Insects, Rats and Parasites and their Relation to Health.

WATER SUPPLY

The west side of the hall has models, maps, charts and paintings which illustrate various phases of the problem of the water supply. One group of exhibits deals with the natural history of water supply as it affects the life and health of man. A large painting depicts the primary source of water supply, the sea, which by way of the clouds supplies the secondary sources: the rivers and lakes. Diagrams, models, and a relief map show the variation in rainfall at different points in the United States. A large floor case has glass models of the principal micro-organisms, Algae and Protozoa, which grow in reservoirs and impart tastes and odors to water. Samples and models here also illustrate the variations in composition which occur in natural waters.

A series of relief maps on the wall shows the growth and development of the water supply of New York City since 1664, and a large floor model displays accurately the location of the reservoirs and aqueducts of the Ashokan Water System. Similar 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.

A model on the west wall explains graphically how an artesian well, sunk through impervious rock, is supplied with water which has flowed underground along the rock strata from the place where it entered the ground a great distance away.

Several cases are given over to models illustrating the purification of water by storage, filtration and disinfection, and there are elaborate representations of the plants of Little Falls, New Jersey, and Albany, New York.

A model depicts the dangers from improper disposal of the liquid wastes of the city and how they may be avoided. In a relief map, actual points of danger in the neighborhood of New York are shown, where polluted harbor waters, bathing-places, and shellfish beds constitute a menace to health. The part played by polluted water in the typhoid epidemic of Lowell and Lawrence, Massachusetts, is explained by a relief map.

SEWAGE DISPOSAL

Modern methods for treatment of sewage on scientific lines are illustrated by a series of models of screens, sedimentation tanks, and filter beds of various types. These exhibits are located on the west and north sides of the wing.



THE FLEA

One of the enlarged models made by the late Ignaz Matusch from his original studies and now shown in a case devoted to Insect Carriers of Disease

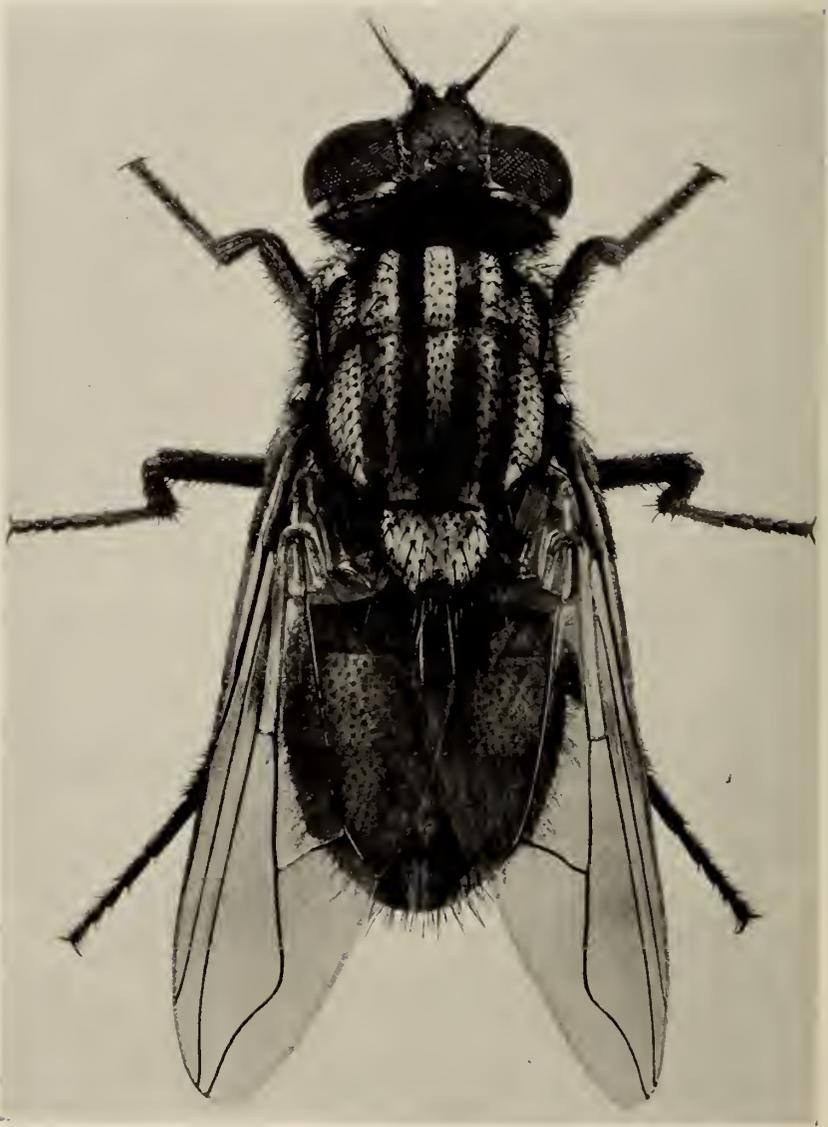
INSECTS, RATS AND PARASITES AND DISEASE

Charts, models and maps on the east and north sides of the hall form this exhibit. First, on the right, are two illuminated cases; one contains photomicrographs of disease-producing parasites and the other contains glass models of various shapes and relative sizes of principal types of bacteria associated with disease.

The transmission of disease germs by insects, notably by the fly, by the flea and by the mosquito, is shown by a series of exhibits. The most striking features are greatly enlarged models of the fly, the flea, the louse and the yellow fever mosquito. Each of these, the finest model of the kind ever made, required a year or more of constant, exacting labor.

**Bacteria
and
Parasites**

**Insects
and
Disease**



THE FLY

A relief map of the State of Arkansas illustrates the coincidence between low swampy regions and the prevalence of malaria, and another **Mosquitoes and Disease** shows the heavy incidence of malaria in the vicinity of marshlands near Boston. The scientific reason for the association of malaria with swampy regions is that the *Anopheles* mosquito, the carrier of the malarial parasite, breeds in such places. A small relief map indicates the type and arrangement of drains used for lowering the water level and eliminating mosquito-bearing pools, and diagrams illustrate the progress made in mosquito control in New Jersey and the financial return which has resulted. Another exhibit illustrates the world distribution and seasonal prevalence of malaria and yellow fever in



THE YELLOW FEVER MOSQUITO

relation to the habits of their mosquito hosts, the breeding-places of mosquitoes, the life history (shown by specimens) and the money-cost of malaria to the United States. Here are also shown some of the practical methods of control by ditching, oiling, stocking with fish, and encouraging enemies such as the bat and certain aquatic insects. Successful repellents are also displayed.

There is a series of small-scale models, attractively worked out by Otto Block, illustrating some of the methods and results of tropical sanitation as applied particularly to yellow fever. A hospital at Panama is shown as it was during the former régime, with mosquito-breeding pools all about and with the legs of the bed and the flower pots set in dishes of water to keep off the ants. In contrast there is illustrated a

modern hospital with all stagnant water removed, and wards screened and ventilated. Other models show the sanitary squads on the Isthmus which fought the yellow-fever mosquito in the town by fumigation, and the malaria mosquito in the country by ditching and oiling. Photographs of four American Army officers, Reed, Carroll, Lazear and Agramonte, to whose researches this advance is due, are upon the wall near-by.

A group of colored drawings illustrates fifteen of the principal species of flies found in eastern North America. Models, specimens and **Flies and Disease** charts in one case, deal with the life history of the fly, showing its various stages in their natural size and actual habitat, and illustrate the large number 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. A wall case shows a group of the natural enemies of the fly: the cock, phoebe, swift, the bat, spiders and centipedes, in characteristic surroundings as they may be seen on a New York State farm on a late August afternoon.

The deadly work of the fly in carrying typhoid fever is illustrated by graphic presentations of typhoid statistics of the Spanish-American War and of the relation between flies and "summer disease" of children, as worked out by the Association for Improving the Condition of the Poor in New York City.

Various types of traps for larval and adult flies are shown, with models illustrating how fly-breeding may be prevented, how human wastes may be protected from their access, and how manure may be cared for so as not to be a medium for breeding flies.

Some space is devoted to certain insect carriers of disease germs of special importance in tropical and semi-tropical countries. Scenes during the Serbian epidemic of typhus fever are illustrated by **Typhus and Other Diseases** photographs and models of the disinfecting train used by the American Mission in the destruction of lice which are responsible for the spread of this disease. Also shown are specimens of Glossinas, which transmit sleeping sickness and the nagana disease in Africa, and of ticks which spread Texas fever of cattle, and relapsing fever, African tick fever and Rocky Mountain spotted fever of man. Photographs and models illustrate the ravages wrought by this disease and the methods used for the control of sleeping sickness in Africa by cutting the bush along the banks of swamps where the Glossinas breed, by the destruction of infected villages and the isolation of infected persons in concentration camps.

The relation of the flea and rat to the terrible bubonic plague is also illustrated in considerable detail. Reproductions of sixteenth and seventeenth century drawings show with what terror the Black Death was regarded in pre-scientific days. In several cases are 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 in Washington. A habitat group shows a typical family of ground squirrels on a rocky hillside in central California, during the breeding season in May. Preventive measures used against the plague are illustrated by models of a farm with buildings rat-proofed, of a rat-killing squad, equipped for work in San Francisco, of a ship at dock with rat-guards to prevent the access of rats to the shore, and by specimens of various types of rat-traps.

A case is devoted to the problem of military hygiene, so successfully solved during the Great War. Diagrams illustrate the relative deadliness of disease germs and bullets in earlier wars; and their lesson is reinforced by a representation of the relative importance of injuries received in action and of the results of typhoid fever during the Spanish War. One company, confronted by a cannon, suffers the loss of one man wounded, while the other, facing a tube of typhoid germs, has one dead and thirteen in the hospital. Other models show how camp wastes are disposed of and how water supply is sterilized, and still others, how the soldier's tent is protected against mosquitoes and how a field hospital is equipped.

One of the central floor cases contains two contrasted models showing sanitary and unsanitary 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.

Return to Jesup Statue, Memorial Hall, South Pavilion

WEST CORRIDOR
ASTRONOMY

Directly adjoining Memorial Hall on the west, or left, is the Pro-Astronomic Hall containing among other exhibits the paintings by Howard Russell Butler of the eclipses of 1918, 1923 and 1925, and striking illustrations of the solar prominences of 1895, 1918, 1919, and 1920.

In the corridor, near the Pro-Astronomic Hall, are cases of rare astronomical instruments, sundials, compasses, etc. In the same corridor may be found oil paintings of the Aurora Borealis, the work of Mr. Leonard M. Davis.

SOUTHWEST COURT
 SCHOOL SERVICE BUILDING

Adjoining the West Corridor is the Bickmore Memorial Corridor, named in honor of Professor Albert S. Bickmore who inaugurated the work of the Museum with the schools. This leads to the School Service Wing which contains the exhibits, offices and classrooms of the Department of Education.

EDUCATION HALL

The department of Education is concerned directly with work with the public schools of New York City through its loan collections of lantern slides and objects of natural history and through illustrated lectures given at the Museum and at certain of the public schools. In coöperation with the College of the City of New York and New York University, several courses for college credit are also given for teachers and college students. Adult education is also receiving special attention.

The department occupies the School Service Section, a five-story structure completed in 1926.

On the first floor is Education Hall, which is used also for important temporary exhibits and special gatherings.

The second floor contains a main lecture hall, seating five hundred, which can be divided into smaller halls, and there are class rooms, a model school nature room, and a special room for the blind.

On the third floor are offices for the staff, the slide-circulating department, a display of the collections available for loans, the teachers' reference library, and consultation room.

The extent of the work of the department is shown by the summary for 1933, page 13.

Return to the West Corridor

SOUTHWEST WING
INDIANS OF THE WOODLANDS

Opening from the west corridor are three halls containing collections from the North American Indians, which, together with the hall in the south central wing, present the nine great culture areas of North America. (See map at the right of the entrance.)

The hall you now enter represents three of these culture areas. Filling the greater part are collections from the Eastern Woodlands tribes, who occupied the middle portion of the North American continent, east of the Mississippi. In a wall case to the left of the entrance is a comparative exhibit, in miniature, of the house types, methods of cooking, transportation, and dress of the various North American tribes. Midway of the hall on the right side are represented the peoples of the Southeast.

Near the entrance of the hall will be found relics of our local Indians. On the left are some specimens of pottery vessels and many small objects of stone and bone recovered from Manhattan Island and the neighboring territory of Staten Island, Long Island, and Westchester County. Nearby on the same side of the hall are collections obtained from living Indians of the coast region north and south of New York. These are the Penobscot and Passamaquoddy of Maine, the Micmac and Malecite of the lower provinces of Canada, and a few but rare objects from the Delaware who once occupied the vicinity of New York City and the State of New Jersey. The age and historical relations of these cultures are shown in a large label at the left of the entrance.

A family group of Micmac Indians, in a birchbark wigwam, is shown half way down the hall.

On the opposite, north side, are the Iroquois, whose league comprised the Mohawk, Seneca, Oneida, Onondaga, Cayuga, and later the Tuscarora. They dominated New York and much adjoining territory. The exhibits represent particularly the agriculture of the East, which was carried on with rude tools by the women.

In a case in the aisle are exhibited wampum belts which were highly esteemed in this region. They served as credentials for messengers and as records of treaties and other important events. Later, wampum beads came to have a definite value as currency, especially in trade between the white man and the Indians.

In the farther end of the hall, on the left, are the collections from the Ojibway, Hiawatha's people, who lived mainly north of the Great Lakes. They had but little agriculture, living chiefly by hunting and fishing. Beyond the Ojibway are the Cree, who lived still farther north. Here is to be seen the rabbitskin clothing of our childhood rhymes.



AN IROQUOIS WARRIOR

From the group in the Woodland Indian Hall

Opposite the Ojibway are the great Central Algonkin tribes, the Menomini and Sauk and Fox, who lived south and west of the Great Lakes. They gathered wild rice and hunted and fished, also practising some agriculture. In one of the Menomini cases are some skin bags beautifully worked in porcupine quills. These bags were used in the

Midéwin, the secret society of the shamans. Visitors interested in the designing art will find the cases of this hall full of bead, quill and textile designs of a high order. (See *Guide Leaflets*, Nos. 41, 50, 63, "Indians of Manhattan," "Indian Bead Work" and "Indian Costumes.")

The dwellings are of several forms, among which may be mentioned the long rectangular houses of the Iroquois covered with oak bark; the dome-shaped huts of Long Island and vicinity which were covered with mats and bundles of grass, and the familiar conical wigwam of the Ojibway covered with birchbark. The utensils are of pottery, wood or birchbark. Pottery was not made by all the Eastern tribes and seems to be associated with the practice of agriculture. The designs are incised, never painted. Bowls, trays, and spoons are made of wood and often decorated with animal carvings. The use of birchbark in the construction of light, portable household vessels is a particular trait of our Eastern Indians.

In the southeastern portion of the United States, agriculture was highly developed. These tribes are represented by the Cherokee and Yuchi, who made pottery, and by the Choctaw and Chitimacha, who made interesting baskets of cane. The Seminole of Florida have maintained an independent existence in the Everglades for nearly a century. Their picturesque costumes are shown. Their prehistoric arts are illustrated in the table case; they excelled in polishing stones and working shell.

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.)

On the left side of the entrance, against the wall, is a special exhibit of life casts and photographs of typical Plains Indians, with tables and charts explaining their chief racial characteristics.

Occupying the greater part of the hall, beginning on the left, are the buffalo-hunting tribes: the Plains-Cree, Dakota, Crow, Blackfoot, Gros Ventre, Arapaho and Cheyenne. These tribes did not practise agriculture but depended almost entirely on the buffalo; buffalo flesh was their chief 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



A DANCER OF THE DOG SOCIETY

Arapaho Indian

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.

On the right, near the entrance, are the village tribes of the Plains: the Mandan, with whom Lewis and Clark passed the winter of 1804-1805, the Hidatsa who now live with them, and the Omaha, Kansa, Iowa and Pawnee. All these tribes raised corn and lived in earth-covered

houses of considerable size. A small model of one of these houses stands near the exhibits.

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



A DOG FEAST OF THE SIOUX

Given in honor of Mr. Sanford (the Indian agent), Pierre Choteau, K. McKenzie and Mr. Catlin. From the Catlin Collection of paintings.

There were numerous soldier societies among the Plains Indians which included practically all the adult males. Each society had a special dance and special costumes. (See the Arapaho cases for costume dances.) There were other dances connected with tribal religious ceremonies, the best known and most important of which is the Sun Dance, illustrated by a model at the left of the tipi. The Sun Dance was held annually in the early summer in fulfilment of a vow made during the preceding winter by some member of the tribe who wished a sick relative to recover. The dance involved self-torture, great physical endurance and a fast lasting three days.

SOUTHWEST TOWER

The Blackfoot collections extend into the tower, in which a general collection of quill and beadwork is also shown.

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

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 and *Guide Leaflet* No. 50, also *Handbook* No. 1, North American Indians of the Plains.)

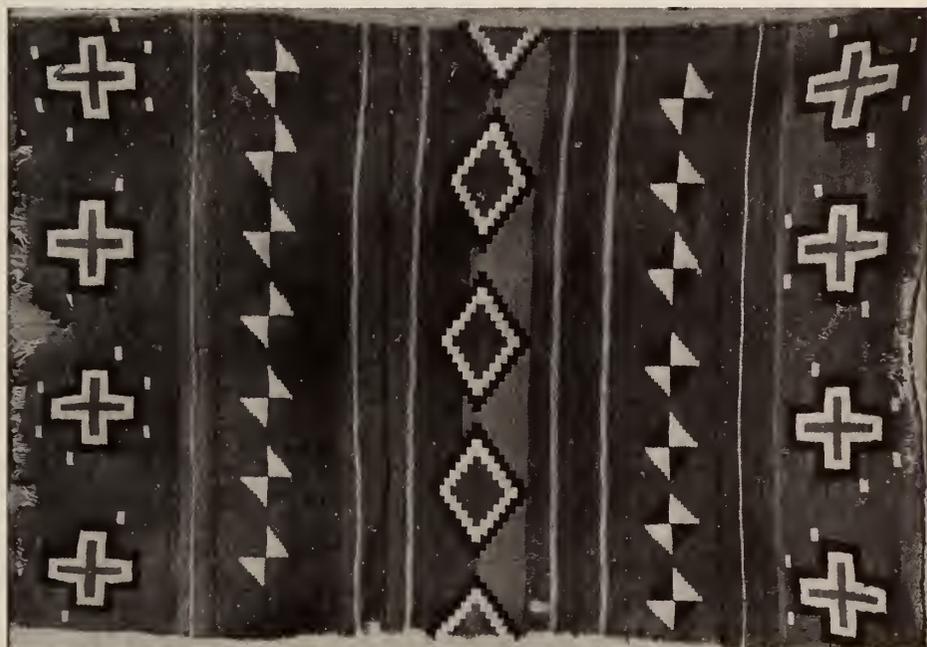
WEST WING

INDIANS OF THE SOUTHWEST

This hall presents collections from both the prehistoric and the living Indians of the Southwest. On the right are the nomadic tribes:
Nomadic the Apache, Navajo, Pima, Papago and Havasupai. In
Indians the first alcove to the right is a basketry exhibit, showing types of baskets and the methods of weaving. The home life of the San Carlos Apache is illustrated by a life-sized group, the first in a series of groups on the right side of the hall. Adjoining is a larger group showing a Navajo hogan in Cañon de Chelly and the Night Chant ceremony. The painted background in this group gives a view of the Cañon, and in a cave of the walls of the same, one may see the famous White House ruins.

In the nearby cases, silverwork, basketry, and other Navajo objects are shown. They are the present-day blanket makers. They make use of the wool of the sheep they raise, carding, spinning, and weaving it with simple implements and looms. This art is believed to have arisen since the coming of the Spaniards and it is known to have passed through several stages in the last sixty years. The older types of blankets here shown contain yarn which was obtained by cutting or raveling from imported flannels, called in Spanish "bayeta," from which these blankets 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, are made of yarn of native spinning, dyed with native vegetable and mineral dyes.

The Navajo are a large and widely scattered tribe. During the winter they occupy log houses, but in milder weather they camp in the slight shelter of a cliff or windbreak and shade made of brush. They live by raising corn in the moist valleys, and on the flesh of their numerous flocks of sheep.



NAVAJO BLANKET

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

The Western Apache live along the upper portion of the Gila and Salt rivers, where they practise agriculture, gather the wild products, and hunt. People, related to these, under Geronimo, raided the settlements of southern Arizona and northern Mexico and evaded our troops for years. They live in grass-thatched houses or in the open under the shade of flat-topped, open-sided shelters.

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 they are like their Southwestern relatives and neighbors.

Apache baskets are shown in the large case to the right of the entrance, which is in contrast with the corresponding case of pottery on the opposite side. 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* No. 2, "Indians of the Southwest.")

At the left of the hall, as we enter, are exhibits for the modern village Indians—first types of pottery from the Rio Grande villages, as San **Pueblo Indians** Ildefonso, Santa Clara, etc. At intervals down the hall are exhibits for the Hopi and Zuñi. On the right side of the hall, next to the Navajo group, is a representation of Hopi life.

The Pueblo Indians live in large community houses, built of stone or adobe, often with several receding stories. 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. In the hall are models of the pueblos of Taos and Acoma, of prehistoric cliff-dwellings, and of the houses used by the Navajo.

In the Hopi section are costumes, masks, images, and plaques used in their ceremonies. Their best known ceremony is the Snake Dance, the performance of which is supposed to increase rainfall and the crops. Some of the regalia for this dance is shown in a special case.

The inhabitants of Zuñi are believed to be the descendants of the first people seen by the Spaniards in 1540. Their former villages, many of which now are in ruins, were probably the "Seven Cities of Cibola," for which Coronado was searching at that time. Although there were missionaries among them for about three centuries, they have retained many of their own religious ceremonies. Many ceremonial objects as well as those pertaining to everyday life are shown in this alcove. In the last case on this side of the hall are examples of Zuñi and Acoma pottery.

In the center of the hall and in alcoves to the left are special exhibits for the prehistoric Indians of the Southwest. Near the center is **Prehistoric Indians** an exhibit showing how many prehistoric ruins have been dated by the tree-ring method. A chart at the entrance to the hall gives the successive culture periods for the Southwest, beginning with early Basket Maker and ending with the modern Pueblo villages. Typical objects made by the Basket Makers are shown in small cases in the center of the hall and in upright cases to the left.



THE APACHE GROUP

The scene is laid in the valley of the San Carlos River, Arizona; the time is summer, and the Indians are shown engaged in the ordinary pursuits of daily life.

Two of the most famous prehistoric Southwestern ruins are Bonito and Aztec. A model of the latter stands in the center, and near the entrance is an exhibit of turquoise from Pueblo Bonito. Other collections from these two ruins are shown in cases at the left of the hall. The one at the wall contains a remarkable collection of pottery from Pueblo Bonito. Similar black-on-white wares with very elaborate and splendidly executed designs, shown in an adjoining case, are from Rio Tularosa, and in part from cliff-dwellings. In another case will be found material gathered by the Museum expedition which explored the Galisteo Valley, New Mexico.

At the north end of the hall, at the right, is an exhibit from the Indians of California.

Return to East Corridor (Elevators) and ascend to the Second Floor.

region or characteristic of it, the more important, or more striking, being displayed in groups that tell something of their home life or of the region in which they live. The individual specimens give some idea of the variety of species found in North America.

The first center exhibit to catch the eye is a group of Moose from New Brunswick, and beyond this the American Bison; these groups, **Moose,** mounted years ago, are still among the finest as well as the **Bison** largest examples of their kind. See *Guide Leaflet, No. 53,* "The Story of Museum Groups."



BISON COW AND CALF

A Characteristic North American Mammal

Immediately at the right of the entrance are the Grizzly and Alaskan Brown Bears, the latter the largest members of the family; and the Giant Moose of Alaska. The larger groups, following in order, are the Grant's Barren Ground Caribou, Greenland Musk-Ox, Pronghorn Antelope, Muskrat, Black Bear, Puma, Polar Bear, Mountain Sheep, Roosevelt Elk, Rocky Mountain Goat, Beaver, Timber Wolf, Virginia Deer, and Peccary. Smaller groups include Coyote, Wildeat, Pack Rat and Jack Rabbit. The habitat groups proper show the animals in some characteristic occupation and, whenever possible, in a family group

The Barren Ground Caribou are animals of the waste and treeless regions of Arctic America where it is impossible for other members of **Grant's Barren Ground Caribou** the deer family to exist. At regular intervals these animals gather in immense bands and migrate, going northward in spring and southward in the fall. The specimens in the group were obtained by A. J. Stone at the western end of the Alaska Peninsula in October, 1907.

The Musk-Ox is adapted for life in the far north and usually travels in bands of a dozen or more. Its food in summer consists mainly of **Musk-Ox** grass; in winter, trailing willows, pawed up from under the snow. According to Stefansson, the Musk-Oxen have no fear of wolves—it is the wolves that fear them. The specimens in the group were collected by Commander Robert E. Peary on Bache Peninsula, Ellesmere Land, in October, 1898.

The handsome Pronghorn Antelope, peculiar to North America, **Pronghorn Antelope** once found in vast numbers on the western plains, was verging on extinction but is now increasing in numbers.

Owing to its wide distribution, the rapidity with which it breeds, and the growing scarcity and increasing demand for furs, the muskrat **Muskrat** has become one of the most important of fur-bearing animals, and its skins are sold literally by the million.

A group at the right-hand side of the hall shows general color variations of the Black Bear. Among these are the Cinnamon **Black Bear** Bear, the Glacier Bear, and Kermode's White Bear.

The Puma is very wide-ranging, being found over a great part of North and South America. In its many forms or species, it displays **Puma** great adaptability to environment and is found not only in heavily forested districts and high mountains, but on arid desert areas as well.

The Polar Bear inhabits the coast of the Arctic Ocean, wandering over the great ice-floes and along the shores of northern islands seeking **Polar Bear** seals and young walrus. The huge flat paws and powerful muscles make the animal a strong swimmer; the coat of long, almost woolly hair and a thick layer of fat protect it from the intense cold. The large male in the group was brought from Payer Harbor, Greenland, in the spring of 1902 by Commander Robert E. Peary.

Mountain Sheep inhabit the more inaccessible mountain ranges of the West, from northern Mexico through the Bad Lands and Rocky **Mountain Sheep** Mountains almost to the shore of the Arctic. They are gregarious, occurring in small flocks. When undisturbed, each flock is headed by a ram, but when danger threatens, he assumes the rear guard and a ewe takes the lead.



PRONGHORN ANTELOPE

This animal is peculiar to North America and is the only hollow-horned ruminant in which the horn sheaths are shed yearly.



ON THE TRAIL, TIMBER WOLVES IN COLORADO

At the end of this hall is a group of Roosevelt Elk found in the **Roosevelt Elk** 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.

This animal is not a goat as the name implies, but an antelope. It **Rocky Mountain Goat** is found from Idaho to Montana northward through British Columbia to the mouth of Copper River, inhabiting steep mountain ranges and inaccessible peaks. Several forms or subspecies are now recognized.

The Beaver, formerly the most important, from a commercial standpoint, of North American mammals, and one intimately connected **Beaver** with the early history and exploration of the continent, is represented actively at work.

The cats, wolves and foxes, and the host of small creatures like squirrels, rats and mice, are represented by numerous characteristic **Cats, Wolves and Foxes** examples. Here are the Jaguar, the largest of the American cats, the Puma, the well-known Coyote or Prairie Wolf and the little-known white Arctic Wolf from the extreme north of Greenland. Here too is the Arctic Fox in its two color phases, the valuable blue and the more common white, the one in prosperous times bringing as much as \$140 for fur, the other worth only \$12 to \$60.

One of the most beautiful and at the same time simplest groups in **Timber Wolf** the Museum is that showing part of a pack of Timber Wolves following the tracks of deer. *See page 63.*

The Virginia or White-tailed Deer, found over a large part of North **Virginia Deer** America, is shown in its summer coat; other species of our deer are displayed in the adjoining cases, and some beautiful albinos may be found in the hall above.

The Peccary, one of two species related to the pig family and peculiar **Peccary** to the Americas, is really an intruder from South America.

SOUTHEAST PAVILION

Before entering the East Wing, we pass through the Southeast Pavilion. On the left is a group of European Wild Boars and a Siberian Tiger later to be included in a group in the Hall of North Asiatic mammals. To the right are temporary exhibits devoted largely to small groups of mammals that are, or were until recently, found within fifty miles of New York City. Among these are the Skunk and Opossum, Gray Fox and Brown Bat, Weasels, summer and winter pelage; Otter and Mink, Red Fox, Woodchuck, Gray Squirrel, Chipmunk and Flying Squirrel, Cottontail Rabbit, Varying Hare and Red Squirrel, Muskrat, Porcupine.



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 is a house with part torn away to show the little beavers within. Beavers generally build their houses in the water, but where they are not molested they often construct them on land as shown here.

The Opossum, noted for its cunning and tenacity of life, is the sole representative in the United States of the marsupials, or pouched **Opossum and Skunk** mammals. The skunk is a useful, though much abused animal, now valuable for fur which is sold under the euphemistic name of Alaska Sable. While it occasionally destroys



THE WEASEL IN WINTER

One of the groups representing the small mammals found within fifty miles of New York City. The others of the series show opossum, red and gray foxes, skunk, mink, muskrat, woodchuck, rabbits and squirrels.

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 to a considerable distance.

The Weasel, in summer and winter dress, the Otter and the Mink are **Weasel, Otter and Mink** three important fur-bearing animals still found near the towns and cities. Weasel fur is often used in place of ermine.



INDIAN ELEPHANTS

Dominating the center of the South Asiatic hall is a group composed of a male and a female Indian elephant.



THE WATER BUFFALO

There are eight large habitat groups in the South Asiatic hall, and this one of the Indian or water buffalo shows a scene in the Central Provinces. These are the wild representatives of the ox which has been so widely domesticated throughout southern Asia.



A PAIR OF LEOPARDS IN SOUTHERN MYSORE

In a *shola* or wooded glen, a leopard has just captured a peacock and the two survivors of the flock are flying off through the trees. Pea fowls are a favorite prey of the leopard.

EAST WING
**VERNAY-FAUNTHORPE HALL OF SOUTH
 ASIATIC MAMMALS**

Leaving the North American mammals and the Southeast Pavilion, we enter the new Vernay-Faunthorpe Hall of South Asiatic Mammals.

Here, in naturalistic settings of carefully selected accessories and beautifully painted backgrounds, all the greater game-mammals of southern Asia, as well as many of the smaller species, are on display.

This hall was formally opened on November 17, 1930, and a special guide to the hall will be published at an early date.

After viewing the splendid collection of mammals brought together by Mr. Arthur Stannard Vernay and the late Lt. Col. John Champion Faunthorpe, the visitor must retrace his steps through the Hall of North American Mammals to reach the Hall of Birds of the World.

Return to the South Pavilion



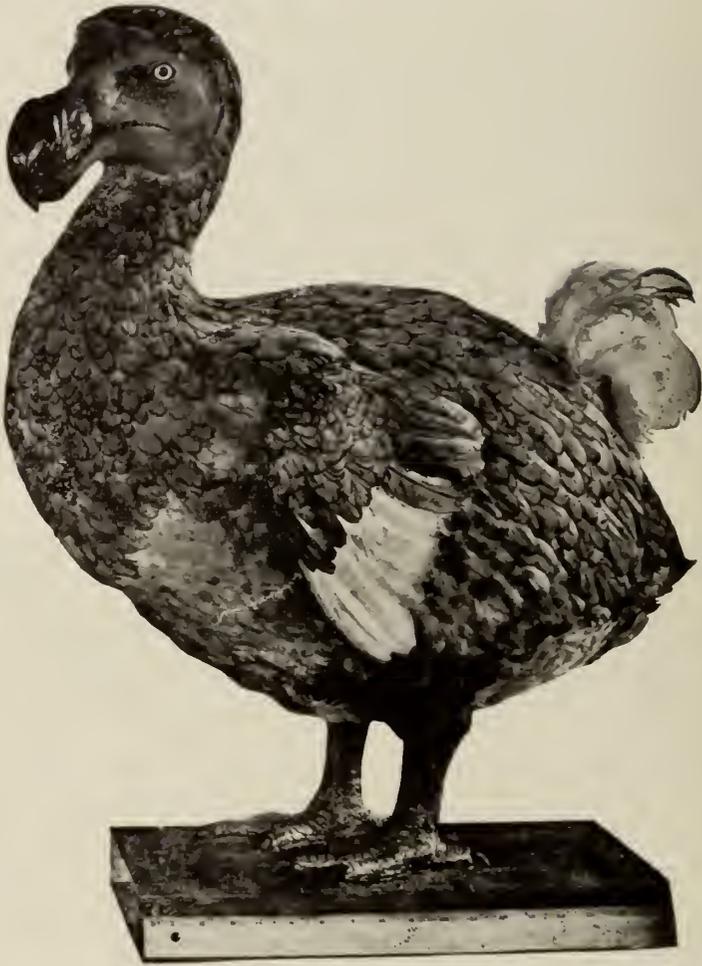
LABRADOR DUCKS

From the Group showing these extinct birds

SOUTH CENTRAL WING
BIRDS OF THE WORLD

Going north we enter the hall containing the general collection of birds. The most striking feature is the exhibit of Birds in Flight, **Systematic** examples of such powerful fliers as the Condor, Eagle, **Collection** Ducks, Geese, and others, as we would see them in nature flying overhead.

In the first four main cases on the right, the 13,000 known species of birds are represented by typical examples of the principal groups



THE DODO

Restored from Old Dutch paintings. This gigantic pigeon was at one time abundant in Mauritius but it was quickly exterminated by early navigators.

arranged according to Sharpe's conception of their natural relationship. 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 the great faunal regions, the Antarctic, South American Temperate, American Tropical, North American Temperate, Arctic



THE PTARMIGAN IN WINTER

One of a series of groups showing the bird's seasonal changes of colors brought about by molting and feather growth.

Eurasian, Indo-Malayan, 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 classification.

In the alcoves near the entrance are several cases containing birds which have become extinct or nearly so. The Labrador Duck, once a common visitor to our Long Island shores, became extinct for no known reason. The Great Auk and the 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, but the last individual died in captivity September 1, 1914. The Heath Hen formerly had a wide 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. Specimens of all of these birds are shown here, the Dodo being represented by an incomplete skeleton and by a life-size reproduction copied from an old Dutch painting. 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 reasonably 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 the plumage for millinery.

In certain alcoves are several cases designed to illustrate the natural history of birds.



THE AMERICAN ROBIN—FIRST OF THE GROUPS OF LOCAL BIRDS

The widely different plumages (varying with age, sex, season, or all three) often worn by one species, will be found illustrated in the **General Topics** Ptarmigan case and in the case containing Orchard Orioles, Snow Buntings, Scarlet Tanagers and Bobolinks. The relationship 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. Other cases show instances of albinism, hybridism and other abnormalities; the excessive individual variation in the Ruff; the birds of prey used by man in hunting; a few domesticated birds (an extensive collection of which will be found in Darwin Hall); the growth of

the embryo and the structure of the adult bird; Archæopteryx, the oldest fossil bird; and a map-exhibit of migration.

At the west side of this hall is an entrance to the School Service Building in which is the Nature Room maintained by the School Nature League. There are also class-rooms and exhibits used in connection with the Museum's School Service.

In the fifth alcove to the right the case contains the Synoptic 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.

At the farther end of the hall is a collection of Birds of Paradise, presented by Mrs. Frank K. Sturgis. This family of birds, confined to New Guinea, Australia and some neighboring islands, though related to the crows, is noted for gorgeous plumes, wonderful as well in variety of form and position as in beauty.

Return to the South Pavilion

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 species 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 case next the windows on the visitor's left is the Seasonal Collection containing the birds which may be expected to occur in this region during a part or the whole of the current month; in its left-hand two panels are the *permanent residents*, which are never changed, and in the right-hand two are the *migrants*, which are changed as necessary about the first of each month. In the next case on the left begins the *General Collection* of all birds found within this area, beginning with the grebes and continuing around the hall to end with the thrushes by the southwest window.

Besides the table case containing the eggs (often with the nest) of species known to nest within fifty miles of the City, there is 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.

At the head of the stairs, on one side, is a map of the country within fifty miles; on the other, a case of *accidental visitors*—stragglers from other parts of the country and from other countries which have been taken within our limits.

At the other end of the room, between the windows, are exhibits which explain what is meant by a subspecies, and through what changes of plumage a bird passes from the time of hatching; also a bust of John Burroughs, by C. S. Pietro, the gift of Henry Ford.

SOUTHWEST WING

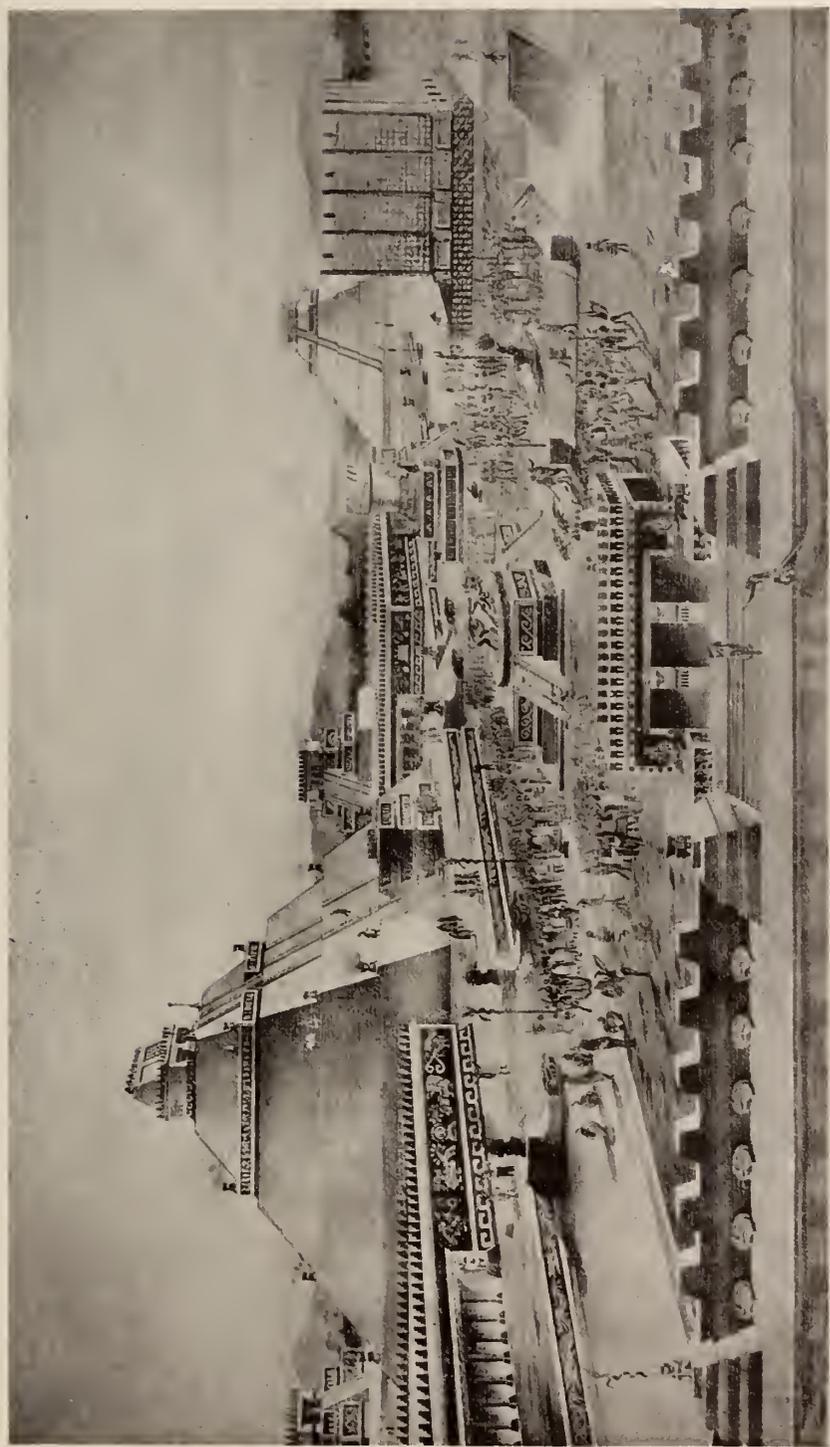
ANTIQUITIES OF MEXICO AND CENTRAL AMERICA

Continuing west past the collection of local birds, we enter the *Southwest Wing*, devoted to the ancient civilizations of Mexico and Central America. The civilizations represented here have a general similarity indicating a common New World origin, distinct from any connection with the civilizations of Egypt, India, or China.

Foremost among these civilizations is that of the Maya of Yucatan and Guatemala, who reached their peak in the first thousand years of the Christian era. Examples of their craft occupy the cases **Peoples** in the first third of the hall, at the right. Next rank the Aztecs and the semi-mythical Toltecs of Central Mexico, who flourished from 750 to 1519 (the Spanish Conquest); the handiwork of these people is exhibited on either side of the central third of the hall. The right end of the hall is given over to the products of the Totonac and Huastec of Vera Cruz and the cruder cultures of northern and western Mexico. On the opposite side are collections representing the Zapotec and Mixtec civilizations of Oaxaca. The southeastern third of the hall is occupied by the Keith collection of antiquities from Costa Rica.

A striking feature of Central American civilization was the temple architecture, erected by the people under the direction of the priests who **Architecture** governed them. Models of these buildings are distributed throughout the hall. Richly carved details from various ruins of Yucatan and from Copan in Honduras are to be seen in the north-east wall case. Especially notable are the casts of great stelae on which the Mayas recorded important astronomical data; these are set along the central aisle and in the Maya section.

The Central American civilizations produced master sculptors. Attention is called to the synoptic exhibition in the first A-case on the **Sculpture** right of the aisle, to the Totonac sculptures in pottery and stone farther down the hall, and to the superb stone Corn Goddess shown with the casts of other deities in the Aztec section. The earliest art yet discovered in Central America is represented by the little clay figures found in the lowest strata of human occupation in the Valley of Mexico, also exhibited in the Aztec section.



After the Reconstruction by Ignacio Marquina

THE GREAT PLAZA—TENOCHTITLAN, MEXICO—A RECONSTRUCTION

The minor sculpture in semi-precious stones is of great beauty, and examples in jade and rock crystal are arranged in the jewel cases in the central aisle. The celebrated jade ceremonial axe and tiger **Jewelry** from the Vera Cruz region, and the jades from Chiapas in the Maya art style, shown in the last of these cases, are among the gems



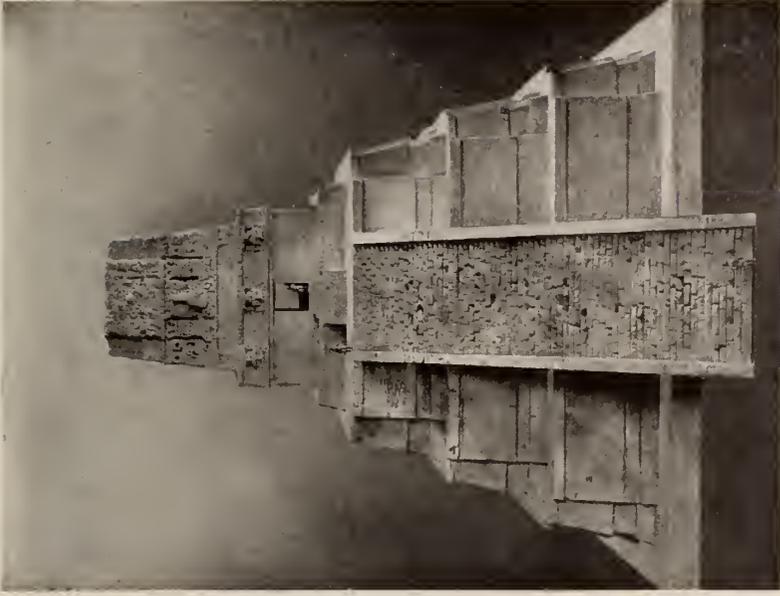
VOTIVE AXE OF JADE, VERA CRUZ

of the Museum. Notable also are the mirrors and other objects of obsidian. The gold work is equally splendid, of which exquisite examples from the Mixtec culture of Oaxaca are shown in the last aisle case, and a magnificent collection from Costa Rica in two others. The first aisle case presents a synoptic exhibition of the Mixtec treasure from Monte Alban, Oaxaca.



STONE FIGURE

Guetar culture, Costa Rica



MODEL OF TEMPLE II

Tikal, Guatemala

The pottery of Central America illustrates as nothing else the remarkably varied nature of the different civilizations. Every region, in fact, every tribe, has its own distinctive form and ornament. **Pottery** Attention is called to the life-size figure at the left center of the hall and the extraordinarily varied figures from the graves in Western Mexico in the northwest wall case. The great Zapotec funerary



THE GODDESS COYOLXAUHQI

Aztec, Valley of Mexico

urns in the southwestern wall case show the grotesque religious conceptions which dominated the life of the people, while the Costa Rican pottery shows the imagination exhibited in the decoration of the humblest household utensils.

Many of the Central American peoples had a system of ideographic writing. Although few of the books are preserved, facsimiles and original examples are shown in the Maya and Aztec sections. **Writing** The great stelae, of which there are many casts, show how the

Maya inscribed their calendric computations, and the east of the huge Aztec "Calendar Stone" symbolizes time and the method of keeping it. The "Sacrificial" stone in the center of the hall is a record of the peoples overcome by one of the Aztec rulers.

The various objects shown in this hall are the imperishable remains of the great civilizations in the past. If the visitor thinks of the elements of our civilization (textiles, paper, iron, etc.) which would disappear in the destructive passage of the centuries and the small residue which would survive, he can estimate the high level attained by these forgotten peoples.

(For further details see *Handbook* No. 3, Ancient Civilizations of Mexico and Central America.)



MASK OF GREEN STONE

Totonac (?) culture, near Teayo, Vera Cruz

SOUTHWEST PAVILION
EVOLUTION OF PREHISTORIC CULTURES
NATURAL HISTORY OF MAN

Continuing westward we pass into the Southwest Pavilion, devoted to exhibits of the early arts and industries as developed by the Cave

**Cave Man
 and the
 Lake Dweller**

Men, the Shellmound Dwellers, the Mound Builders, and the Lake Dwellers before the days of written history.

The section of the hall to the left of the center aisle is occupied by collections from various parts of the entire Old World, while the section to the right of the aisle is limited to antiquities typical of the United States and Canada.

The Old World exhibits are arranged *chronologically*, i.e., by culture stages, beginning with the first table case near the entrance or east wall and ending with the last case near the west wall. For the most complete demonstration of the successive steps in the origin and development of implements and ornaments, ranging from the supposed Eolithic (Dawn Stone) phase up through the Paleolithic (Old Stone) and Neolithic (New Stone) successions and into the Bronze and Iron stages, the row or tier of table cases next the windowed south wall is especially recommended. Old World art objects and pottery, as well as demonstrations of stone and bone working techniques, are displayed in the adjacent wall cases and also in the adjoining tower room.

The New World exhibits are arranged mainly on a *geographic* basis, state by state, beginning with New England and the eastern states next the entrance and ending with the Pacific Coast states and Alaska by the west wall. These state exhibits are not in every instance complete, but each contains one or more examples of such forms of finished objects as are available in the Museum's collections. Pottery from different sections of the country is grouped in the adjacent wall cases. The only chronologic exhibit, from Trenton, New Jersey, will be found in the tower room.

SOUTHWEST TOWER

The wall frescoes to the left of the aisle are copies of early European cave art; those to the right, copies of American Indian art, mostly of late prehistoric date.

WEST WING

INDIANS OF SOUTH AMERICA

The next hall to the north contains exhibits from the Indians of South America. The collections from the prehistoric Indians of Peru, Bolivia Ecuador, Colombia, etc., are arranged in the front of the hall, while at the rear are exhibits for the living Indians.

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. They domesticated the llama, which was used as beast of burden. They excelled in the manufacture and decoration of pottery vessels, in metal work, and in textile fabrics. In the cases directly in front of the entrance, the gold and silver objects, such as beads, cups, pins, and ear ornaments, show the high degree of skill attained in the beating, soldering, and casting of metals.



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.

In weaving, the Peruvians were perhaps preëminent among prehistoric peoples, many of their textiles exhibited here being unsurpassed at the present day. The materials used were cotton and the wool of the llama, alpaca, and vicuña. In the cases near the entrance are examples of these textiles with looms and shuttles. (*Guide Leaflet No. 46, Peruvian Art*, deals with the meaning of the figures shown in textiles and pottery.)

On the right side of the hall are upright cases containing collections from important localities in Peru, followed by exhibits from Ecuador, Colombia, Venezuela, Brazil, and Panama. On the left side as one



TREPHINED SKULLS FROM PREHISTORIC PERUVIAN GRAVES



PERUVIAN MUMMY BUNDLES AND MUMMY

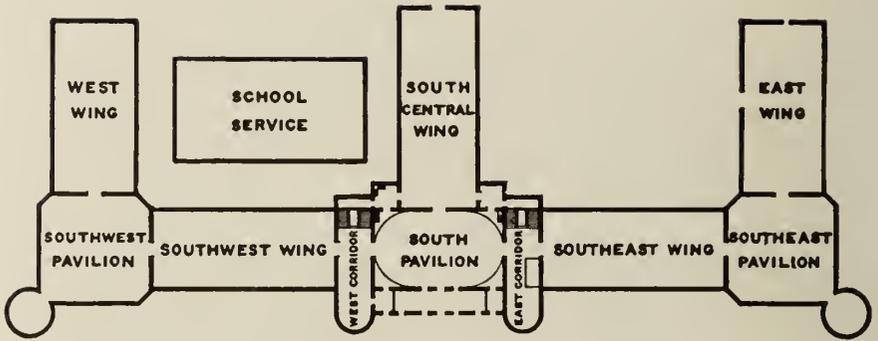
The ancient Peruvians wrapped their dead in fabrics of fine cotton and wool, covering them with a sack of strong cloth. The mummy "bundle" thus produced was often given a "false head" of cloth filled with cotton or vegetable fibre. No attempt was made to preserve the bodies, but climatic conditions in Peru have preserved these mummies and their wrappings during many centuries.

enters are special exhibits representing the Nazca culture of Peru, especially its remarkable pottery vessels, certainly the most beautiful so far discovered in South America. In an adjoining wall case is a special exhibit of Peruvian mummies. Many objects exhibited in the hall are **Mummy Bundles** from such mummy bundles. In no part of America are found so many and such extensive burial places as in the coast region of Peru. Here were interred countless thousands of the ancient dead. In the *huacas* or graves, were placed with the bodies such articles as had been most useful and highly prized during life, and such as were 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. 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.

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 **Chilean Mummy** 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.

Collections representing prehistoric life in Porto Rico and other islands of the West Indies are shown at the rear.

Return to the East Corridor (Elevators) and ascend to the Third Floor



THIRD FLOOR
SOUTH PAVILION
PRIMATES

Near the entrance of the hall are typical examples of the principal groups of Primates, illustrating also their mode of progression and emphasizing the point that man is the only member that stands upright, whose forelimbs take no part in locomotion, and who has perfectly developed hands.

The Systematic Series of Primates, intended to give some idea of the number of species in this order, and their range in size, form, and color, begins on the left with examples of man and is continued in the wall cases around the room, ending with the lemurs. Noteworthy among the Primates is the Gorilla, largest and most powerful of apes, the curious "Proboscis" Monkey from Borneo, and the Aye-aye of Madagascar.

On one side of the hall is a group of the beautiful Horse-tailed Monkeys, which are threatened with extermination owing to the demand for their fur, and on the other a troop of South American Spider Monkeys.

The closed corridor contains a few groups of Primates characteristic of various parts of the world, Africa, Asia, South America and Madagascar, and a group of African Pygmies, a "low" race to be contrasted with the "high" apes.

The African Red Monkeys are rolling up the moss, hunting for insects, and the Red Howling Monkeys are in their favorite home among the tree tops.

Outside of the central corridor, on the south side of the hall, is a group of Orang Utans from Borneo; this was one of the first groups of large animals to be mounted in this country and it was looked upon as a daring innovation.



AFRICAN PYGMIES
Group in the Hall of Primates

On the south side of this hall is installed a notable series of photographs of wild animals donated to the Museum by the men who took them. They were originally part of a competitive exhibition of wild animal photographs shown at a meeting of the American Society of Mammalogists.

At the west, or farther end of the hall, a series of skeletons enables the student to study the comparative structure of the Primates and note the changes that take place in passing from Lemurs to Man.

Temporary Exhibits

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 may be very destructive to bananas and other fruits.

Temporarily placed in this hall also is a small exhibit of domesticated dogs, which, though small, includes some noteworthy examples of various breeds. These are of interest both as showing the effects of breeding, selection by man, and as noting the changes brought about by fashion. Some breeds have almost disappeared. There is no example of the once popular Pug, which, as well as the Black and Tan, is now rare, and the Newfoundland is practically extinct in the United States. On the other hand the Police or Shepherd dog is now common and the Toy Pomeranian has been "created" comparatively recently.

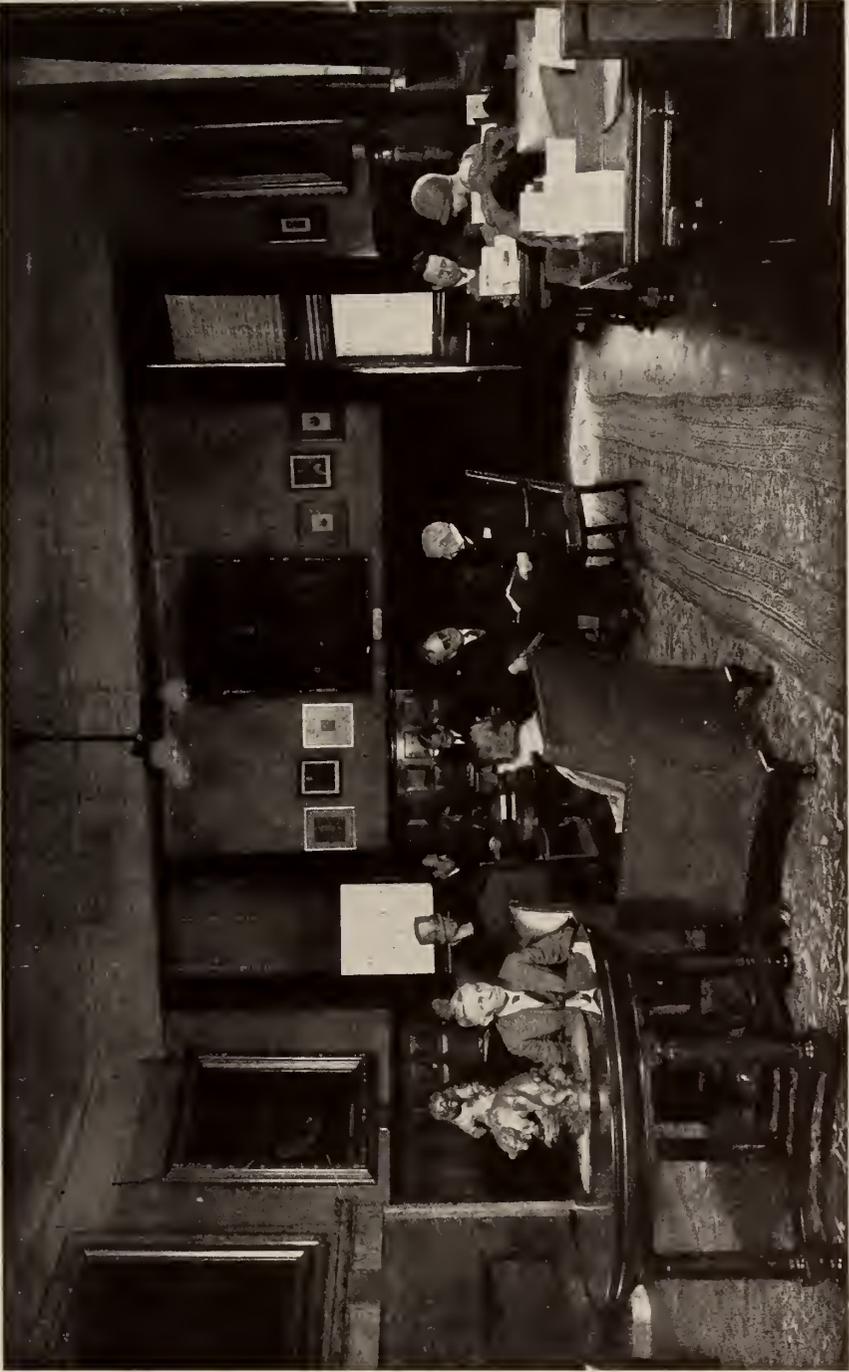
EAST CORRIDOR

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. It contains the portraits of the Presidents of the Museum and of Mr. Choate and Professor Bickmore who played a most important part in the founding of the Museum. Here too may be found books by members of the Museum staff, in many cases based on or describing the expeditions in which they have taken part.

SOUTHEAST WING

SYNOPTIC SERIES OF MAMMALS

Proceeding east from the hall containing apes and monkeys, we pass the elevators to enter the *Southeast Wing*, devoted mainly to a series of exhibits illustrating the characters of mammals, their principal groups, or orders, the main subdivisions of these, known as families, and



MEMBERS' ROOM

various interesting peculiarities of habits and structure. Each family is, so far as possible, represented by a mounted specimen and a skeleton. Walking around the room from left to right, one passes from the egg-laying Platypus to man, represented by the figure of an Australian native armed with the characteristic boomerang. Incidentally one sees among other things the modifications of form and structure for various modes of locomotion, notices the superiority in brain of mammals over other vertebrates, learns that animals that outwardly look alike may be very distantly related, sees illustrations of albinism and melanism, is shown how the coat of the hare changes from brown to white, and adaptations of plants and animals to a desert habitat.

Of special note is the skeleton of Jumbo, the largest elephant ever brought to this country.

The most striking object in the hall is the life-size model of a sulphur-bottom whale, seventy-six feet in length. The original of this specimen 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, twice as much as *Brontosaurus*. 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.

[Recent additions to the Museum building include a large hall containing whales and other marine animals, in which are shown reproductions of porpoises and skeletons of whales. See *Hall of Ocean Life*, p. 32.]

In the rail-cases are exhibits that aim to give the visitor a general idea of the enormous class of insects and of their classification. Species from aestern United States are labeled with clippings from **Insect Exhibits** Dr. Lutz's "Field Book of Insects." Other insect material in these cases is either there on temporary storage or in the course of preparation. In fact, the plan is to concentrate all insect exhibits in the South-east Pavilion.



THE BUTTERFLY GROUP

The Monarch Butterfly—migrating; the group contains over 1200 specimens.

SOUTHEAST PAVILION
HALL OF INSECT LIFE

The arrangement of this hall is still far from complete and many of the exhibits are either remains of old ones or the starting of new ones. **“Textbook of Entomology”** The plan is to have in the circle of “A-cases” a presentation of insect biology, including the relations between insects and vegetation, the importance of insects as carriers of disease, and general biological facts and theories as illustrated by insects. These cases will be numbered to facilitate the work of teachers sending students here for information.

In the center of the hall is a circle of exhibits, some of which show mounted insects in life-like artificial surroundings and others show live **Life-like and Alive** insects and spiders or their relatives. What is shown alive depends upon the temporary availability of material. Among the habitat groups is a series illustrating the life-histories of common butterflies; also the very beneficial Lady Beetles are there next to the very injurious Japanese Beetle. Other groups will be concerned with the Cotton Boll Weevil and such Tropical insects as the Army Ants.

The walls of the hall are used for supplementary exhibits. One of these displays strikingly beautiful butterflies and moths from all parts **The Beautiful and Others** of the world. Another demonstrates the wealth of insect life at our very doors. The commercial use of insect silk and the use spiders make of their silk occupy the north wall. On the east wall are shown some of the results of the research work of the entomological department, especially in the field of experimental biology.

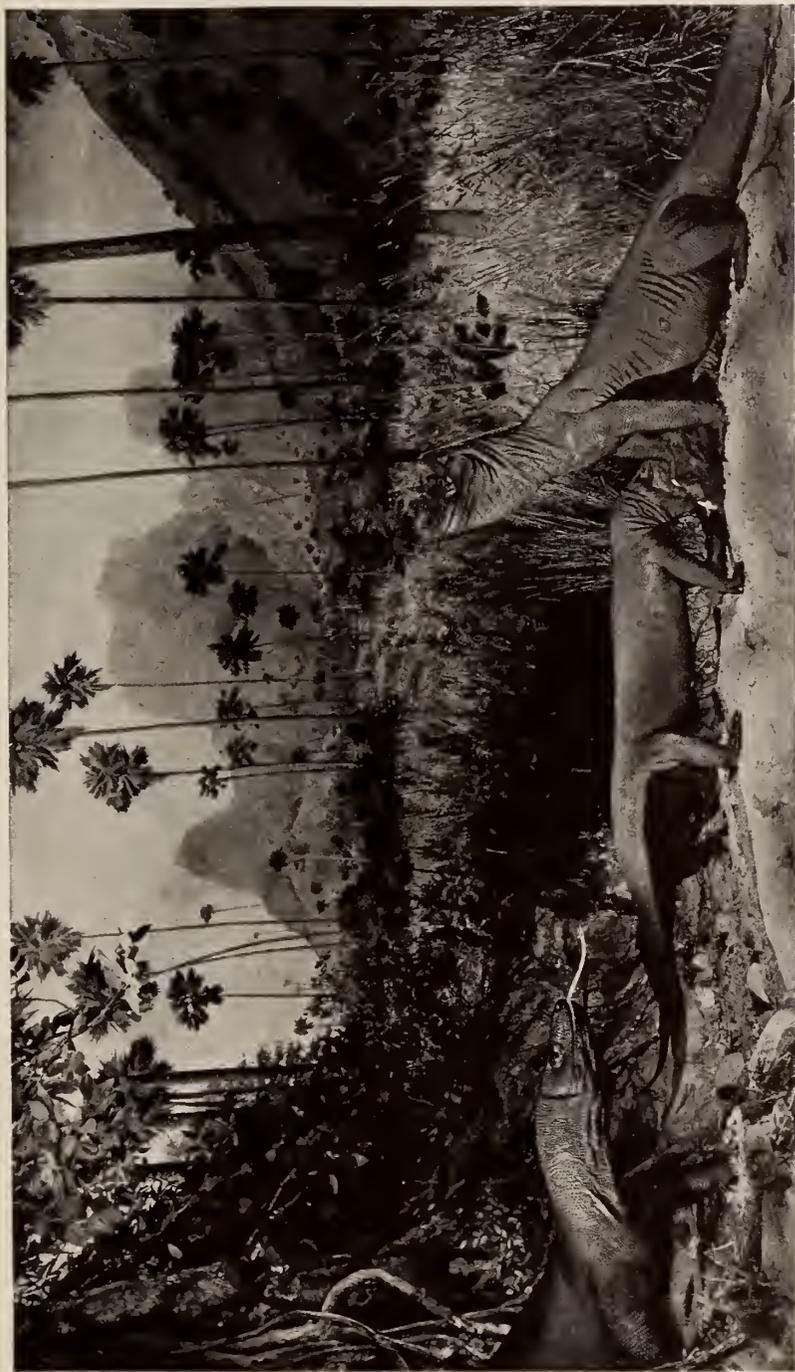
EAST WING
HALL OF REPTILE LIFE

On entering the hall, one is attracted by four floor groups containing the largest of existing reptiles.

On the right is a habitat group of the Dragon Lizards of Komodo **Dragon Lizards** Island. These are the largest of living lizards and are found only on two small islands of the East Indies.

Near this group a large chart is installed, showing in outline the history of all the vertebrate animals, including the dragon lizards.

The visitor will be attracted first to the many floor groups in the main room, these showing reptiles and amphibians in their natural environment. The cases on the right of the hall answer such common questions as, “How do reptiles and amphibians feed?” “How protect themselves?” and “How breed?” or “What is the economic value of reptiles and amphibians?”



DRAGON LIZARDS OF KOMODO

The largest of existing lizards, reaching a length of over nine feet and a weight of over 200 pounds.
Obtained by Douglas Burden



THE ORIZABA GROUP

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

The left wall of the main hall is equipped with sunken cases, in which some of the principles controlling the existence of reptiles and amphibians are illustrated. Among these exhibits are "Natural Selection, the Directing Principle of Evolution," "Isolation, a Major Factor in the Origin of Species," "Concealing Coloration and Form," "Parallel Evolution," etc.

At the far end of the hall is a case devoted to snake yarns, another to the reptile skeletons. Of special interest is an exhibit of snake poison and its treatment.

On the left of the hall, in an enclosed corridor, is a series of habitat groups portraying the home life of American reptiles and amphibians.

The Rhinoceros Iguana group illustrates the complete life story of a single lizard.

The Gila Monster group portrays the home life of the only poisonous lizard. The Giant Salamander group shows the life history of the largest American salamander.

Of special interest is the large Cypress Swamp group at the far end of the corridor.

The nesting habits of the alligator, as well as those of a turtle, are shown in the exhibit. Many facts of biological interest, such as mimicry, sexual dimorphism, and retrograde evolution, are to be found in the group.

Return to the South Pavilion

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 Dr. Frank M. Chapman, Curator of Ornithology, who collected most of the specimens and made practically all 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, Hobart Nichols, Carl Rungius, W. B. Cox, Louis A. Fuertes and Francis L. Jaques. 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 Leaflet No. 28.*) 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:

The distribution of birds, notwithstanding their powers of flight, is limited in great measure by climate. Thus in traveling from Panama **Orizaba** north to Greenland there are zones of bird-life corresponding **Group** to the zones of temperature. This condition is illustrated on the mountain of Orizaba in Mexico, where in traveling from the tropical



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.

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) were once so ceaselessly hunted **Cobb's Island** and slaughtered for millinery purposes. Thanks to **Group** protection they have now greatly increased in numbers.

The group represents a section of an island off the Virginia coast, where the birds are now protected by law.

The Duck Hawk may be found nesting on the Palisades of the Hudson almost within the limits of New York City. It nests on the ledges of the **Duck Hawk Group** towering cliffs. This hawk is the Peregrine Falcon which was so much used for hunting in the Middle Ages. It often comes into the city for pigeons.

In August and September the meadows and marshlands, bordering the Hackensack River, New Jersey, formerly teemed with bird-life, **Hackensack Meadow Group** but this is rapidly disappearing before the march of "improvements." In the group showing these Hackensack meadows are swallows preparing to migrate southward, Bobolinks or "Rice Birds" in autumn plumage, Red-winged Blackbirds, rails, Wood Ducks and Long-billed Marsh Wrens.

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 **Wild Turkey Group** now very rare. It differs slightly 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 it can readily **Florida Great Blue Heron Group** be distinguished from cranes, with which it is frequently confounded. (Reproduced from studies near St. Lucie, Florida.)

In the "bonnet" or yellow pond-lily swamps grown with cypresses and cabbage palmettoes, the shy Water-Turkey builds its nest. It receives **Water Turkey or "Snake-bird" Group** 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.)

Unlike the herons, the Sandhill Crane builds its nest of reeds in the water. It differs also in its manner of flight, always fully extending **Sandhill Crane Group** its neck when on the wing. (Reproduced from studies on the Kissimmee Prairies of Florida.)

Pelican Island, on the Indian River of Florida, has been made a reservation by the United States Government, and these grotesque birds **Brown Pelican Group** formerly bred there in comparative safety. 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 unflinching accuracy. (Reproduced from studies at Pelican Island, Florida.)

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 in 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.)

The Turkey Vulture, or "buzzard," is one of the best-known birds of the South, where it performs a valuable service in acting as a scavenger. On this account it is protected by law and by public sentiment and has become both abundant 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 condor's cave, and is looking down on the river of the cañon. (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 fledgling 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.

Little Diomedé and Big Diomedé form a group of two islands which lie in Bering Sea, fifty miles south of the Arctic Circle and about midway between Alaska and Siberia.

The international boundary line passes between them, Big Diomedé being Russian and Little Diomedé American. The land to the southeast in the central distance of the background is Cape Prince of Wales, a part of the Alaskan mainland distant twenty-three miles. To the right is Fairway Rock.



BROWN PELICAN GROUP

One of the Habitat Groups of North American birds and by many considered the most effective. Although protected by law, the settlement of the adjoining shore caused the birds to abandon Pelican Island.

The site of the group is the lower part of the 1000-foot cliff at the south end of Little Diomedé. Here, protected by isolation, as well as by the nature of their haunts, myriads of murre, guillemots, puffins, auklets, gulls and cormorants come each summer to lay their eggs and rear their young. The murre nest on rocky shelves, laying highly colored pear-shaped eggs which when moved describe a circle about their tip and thus do not roll off the narrow ledges on which often they are laid.

The Guillemots, Puffins and Auklets lay in crevices and holes; the Gulls and Cormorants build crude nests.

Like many other arctic birds, some of those here shown are widely distributed in boreal waters, and hence are found, or are represented by near relatives, on the eastern side of North America, where murre, guillemots, puffins and kittiwakes nest as far south as Bird Rock, Gulf of St. Lawrence. A group from that rock is shown at the left of the entrance to this hall.

There were estimated to be two thousand nests in this colony. The Flamingoes construct their nests by scooping up mud with their bills and packing it down by means of bill 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, and the young is born covered with down like a young duck and is fed by the mother on predigested food. (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, American Egrets, Little Blue Herons, Louisiana Herons, ibises, cormorants and Water-Turkeys. Because of the great inaccessibility of this island it was one of the last places to feel the depredations of the plume-hunter. (Reproduced from studies in the Everglades of Florida.)

A Whistling Swan on the nest is visible far across the arctic tundra, the summer home of this species. The nest is built of moss, etc., and in it are laid two to five white eggs, four and a quarter inches long. Both male and female share the labor of nest-building, incubation, and caring for the young. The cygnets are clothed in white down, soon displaced by grayish plumage, in which they travel south with their parents in the autumn.

Swans feed chiefly on the grasses and tender water-plants they pull from the bottom. Small mollusks are also eaten.

Swans are famous for their loud clear voices.

The Whistling Swan breeds in arctic Alaska and Canada east to Hudson Bay. In winter it is not uncommon locally on the Atlantic Coast south from Maryland and along the Mississippi Valley, Gulf Coast and Pacific Coast. In the Northeast it is a rare migrant.

The Whooping Crane is so nearly exterminated that not only was it impossible to obtain a nest and young, but in making this group it was necessary to use specimens taken many years ago.

The Golden Eagle is one of the most widely distributed of birds. In 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. 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 was 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 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. It is sad to record that the breeding ground shown here, with its wonderful bird-life, has been destroyed by ill-advised drainage. (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 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 brush. In this brush is seen the male Sage Grouse strutting and wooing a mate. (Reproduced from studies at Medicine Bow, Wyoming.)

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, re-



THE WHOOPING CRANE

A bird almost extinct. Shown in the Habitat Groups

sonant, booming note. (Reproduced from studies near Halsey, Nebraska.)

The Wild Goose is one of the first birds to migrate north in the spring. It nests among 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,

**Wild Goose
Group**

so difficult is it to secure the young in nature. (Reproduced from studies made at Crane Lake, Saskatchewan, Canada.)

The grebes are aquatic birds which build their nests in 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 grebes was the Redhead Duck. (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 considerable 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—the Razor-billed Auk, Leach's Petrel, Gannet, Puffin, Kittiwake Gull, Common Murre and Brunnich's Murre. This was the Museum's first large group.

(Reproduced from studies at Bird Rock, Gulf of St. Lawrence.)

Many of these groups are, or are fast becoming, records of past conditions: as pointed out, the lower part of Klamath Lake has been unwisely drained, since the land is useless for farming, and the birds shown in the group have gone; the Newark marshes are being filled in for factory sites. The growth of population and taking up of land for agricultural purposes unavoidably crowd out some birds, lawless shooting lessens their numbers, while predatory cats are responsible for the destruction of many during the breeding season.

(See also *Guide Leaflet* No. 28, *The Habitat Groups of North American Birds*.)

Return to the South Pavilion

WEST CORRIDOR

Occupying the stairway and adjoining walls is the Audubon Gallery, a noteworthy collection of objects relating to the life and work of John James Audubon. These include original sketches and paintings by Audubon, and by his son John Woodhouse Audubon mainly of the Quadrupeds of North America; some of the copper plates from which the *Birds of America* were printed, and a portrait of Robert Havell, their engraver, and the publisher of the first edition of the "Birds." Of special interest are the portraits of

Audubon, including that by John W. and Victor Audubon, so extensively copied. Of more personal interest are the guns carried by Audubon on many of his expeditions and the buckskin suit he wore.

These objects were presented mainly by his granddaughters, Maria R. and Florence Audubon, but the largest piece, a covey of pheasants, was given by Miss M. Eliza Audubon. Gifts have been received also from Dr. Edward H. Rogers, Miss Anne E. Roelker, Robert Havell Lockwood, and others.

SOUTHWEST WING NATURAL HISTORY OF MAN

The Hall of the Natural History of Man when completed will consist of two parts, the first entitled "Introduction to Human and Comparative Anatomy," the second dealing with the physical characteristics of the Races of Man, Development, Growth and allied topics. The first half of the exhibit, on the south side, although not completed, was opened to the public on the occasion of the Third International Eugenics Congress, July, 1932. Work on the second half of the hall has been delayed, owing to lack of funds.

The "Introduction to Human and Comparative Anatomy" begins by showing man in his cosmic aspect, conceived as a living engine which derives its working capital of energy directly or indirectly from the energy of the sun stored up in plant and animal tissue; this energy is appropriated by man in food substances. Case I deals with the intake and outgo of this energy through the various anatomical systems. It shows how the food energy is made available by the digestive system and distributed by the "currency of the blood," namely, the blood corpuscles. Other divisions give the most essential facts regarding the "main pump of the body," the "living bellows" (respiration), heat regulation and the like.

Wall Chart 1, a decorative design, illustrates the history of anatomy and stresses the fact that, thanks to the labors of Darwin and his successors, the study of human anatomy has become a part of the history of the vertebrates in geologic time.

In Case II the exhibits deal with *Organ Systems of Shark and Man*, showing the educational value of the anatomy of the common dogfish as affording an epitome of human anatomy. The organ systems of shark and man are then classified under twelve functional systems, some of which are illustrated by anatomical models.

In Case II B the *Elements of the Locomotor Apparatus* are set forth. In the simplest possible words it is shown how red muscle fibres of the fish are combined into W-shaped muscle flakes, or myomeres, how these

constitute the basis of the active part of the locomotor apparatus and how these muscle segments are represented by the primitive segments of the human embryo.

Wall Chart 2 shows a graded series of living animals forming an *Echelle des Êtres* from fish to man; beneath this are the descending geologic ages and the staircase of fossil forms leading to older and older ages, with lines suggesting their genealogical relations with the living forms.

Case III sets forth *The Skeleton from Fish to Man* in a series of nine skeletons, beginning with a generalized fossil fish.

Wall Chart 3 comprises restorations of these same forms as they may have appeared in life.

Case IV A deals with the *Maintenance of the Upright Posture* in man and is concerned chiefly with the muscles of the back and limbs. In Case IV B one may examine a series of pectoral and pelvic girdles and limbs of vertebrates, showing how these structures have evolved out of the bases of the primitive steering planes of primitive fish.

Wall Chart 4 depicts the general body-form and relative length of limbs of the anthropoid apes in comparison with man. The late foetal stages of the same forms are also represented, and the point is evident that in general appearance the foetal stages are less unlike than the adult stages.

Case V A, *Hands and Feet of Primates*, deals with the muscular anatomy and external form of the hands and feet of primates up to man.

Case V B, *Embryology*, shows models and diagrams of human and other embryos, embryonic membranes, etc.

Wall Chart 5 is entitled *Comparative Embryology from Fish to Man*. It depicts the chief stages from the undivided egg to the adult in shark, lung-fish, salamander, lizard, opossum, monkey (macaque), man. It is based on the most recent embryological material as figured by contemporary authors.

Case VI contains first a series of models of heads of vertebrates representing successive grades of organization and illustrating the evolution of the face; next are five tablets showing a series of models of skulls illustrating the evolution of the skull as a whole and of many of its individual elements; next is a series of models based on the dissections of facial muscles by the late Dr. Ernst Huber of the Johns Hopkins Medical School.

Wall Chart 6 is a sort of genealogical tree entitled *Man among the Primates*. It is practically an illustrated classification, giving life-like color sketches of the principal types of lemuroids, *Tarsius*, New World monkeys, Old World monkeys, anthropoid apes and man.

Case VII A deals with *Skulls, Jaws and Teeth*. There is first a synoptic series of models of the principal known skulls and jaws of fossil primates, next a series of enlarged models illustrating the evolution of the upper and lower premolar and molar teeth from the oldest known mammals to man; another exhibit deals with the history of the jaw muscles.

In Case VII B the *Elements of the Nervous System* are set forth.

Wall Chart 7 depicts the *Rise of the Human Brain*, comparative views of the brains of a structurally ascending series of vertebrates.

Case VIII attempts to give an outline of *The Brain and Its Functions*. It begins with the shark, as representing a type of animal in which sensory stimulus is typically followed by an immediate and direct bodily response, in contrast with man, in whom the response is usually conditioned by ideas and general control is vested in the neopallium.

The north half of this hall is devoted exclusively to exhibits illustrating human biology and is in process of installation. It is planned to show in the successive cases and alcoves, the growth and development of the individual, the differentiation of man by constitutional and endocrine types, the racial classification of man, human genetics, and race mixture, population problems, and the technique of physical anthropology.

SOUTHWEST PAVILION CHINESE AND SIBERIAN COLLECTIONS

If we pass on into the hall at the extreme west end of the building, we find collections from eastern and northern Asia. As you enter you see a **Collections from Asia** remarkable wood carving and in adjoining cases a series of objects from Tibet. 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, while in the tower will be found exhibits from Japan.

The furwork, costumes and rugs of the people of eastern Siberia reveal remarkable skill in workmanship. Two models show respectively summer and winter scenes in Siberia. In the rear are collections from the Ainu and the Amur River tribes noted for decorated fabrics and picturesque costumes. Swinging frames contain a large series of fabric designs.

The collections on the left side of the hall deal mainly with 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, cloisonné enamel, agricultural implements, carvings in wood, ivory and stone, and embroidery, are shown to advantage.

A special collection of great value is found in the ancient bronzes shown in the wall cases near the entrance, and in one of the alcoves on



ANCIENT CHINESE BRONZES

the west side is a series of objects from Tibet, illustrative of the costumes and religious rites of that little-known region.

SOUTHWEST TOWER

An exhibit of Japanese objects is installed in the adjoining tower room.

WEST WING

COLLECTIONS FROM AFRICA

In the *African Ethnology Hall*, the installation is roughly geographical, i.e., as one 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, the central Congo tribes at the far end.

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

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, especially a series of ivories from the Congo, bear witness to the high artistic sense of the African natives, who also excel other primitive races in their love for music, which is shown by the variety of their musical instruments.

A unique art is illustrated in the Benin case in the northern 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 medicine-men.

Return to the East Corridor (Elevators) and ascend to the Fourth Floor.

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.

SOUTH PAVILION OSBORN HALL OF THE AGE OF MAN

The *South Pavilion* is devoted to early man and his contemporaries, the mammoths and mastodons and the giant ground sloths of South America. Down the center of the hall is the collection illustrating what is known of the early history of our own race as shown by the remains of early man and the implements used by him. As fossil remains of man are rare and usually very fragmentary, these are represented mainly by casts, but they include examples of all the more perfect and more noteworthy specimens that have been found, from the Neanderthal and Gibraltar, to the Piltdown and Talgai. (See *Guide Leaflet No. 52, The Hall of the Age of Man.*)

On the left is a group illustrating the famous asphalt trap of Rancho la Brea and fossils from South America, the most striking of which is the group of giant ground sloths. There are also good examples of glyptodonts, gigantic relatives of the armadillo, of the camel-like *Macrauchenia*, the rhinoceros-like *Torodon*, 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 elephant. The first skeleton is the Long-Jawed Mastodon of the Pliocene, a predecessor of the true Mastodon in North America. The "Warren Mastodon" is a classic specimen. It was found near Newburgh, N. Y., in 1846, and is the finest specimen of its kind that has ever been discovered. Next to it is a fine skeleton of the mammoth; portions of skin, hair and other fragments of a mammoth carcass discovered in Alaska are also shown. 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.



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CRO-MAGNON ARTISTS OF SOUTHERN FRANCE

The procession of Mammoths in the Cavern of Font-du-Gaume. One of the Murals in the Hall of the Age of Man
Painted by Charles R. Knight, under the direction of Henry Fairfield Osborn

Around the walls is a series of paintings by Charles R. Knight, portraying some of the more striking animals that were contemporary with early man in Europe and America, and whose skeletons are shown below. Here are the Great Ground Sloths, the Woolly Rhinoceros, the Mammoth and Mastodon and the strange moose-like Cervalees.

(See *Handbook* No. 4, *Animals of the Past*, and *Guide Leaflet* No. 62, *Mammoths and Mastodons*.)

Passing through the East Corridor we come to the Southeast Wing

SOUTHEAST WING

OSBORN HALL OF THE AGE OF MAMMALS

FOSSIL MAMMALS OF THE TERTIARY PERIOD

A particular feature of this hall is the wonderful series in the first alcove on the right showing the evolution of the horse. The Museum is justly proud of this collection, which is one of the most complete series of fossil horse skeletons in the world, and contains two skeletons of *Eohippus*, the little four-toed dawn horse, and numerous other unique specimens. As shown by skeletons of horse and man in another hall, the single toe of the horse corresponds to the middle finger or toe of man, and the other leg and arm bones correspond bone for bone with those of man. In the modern horse, the other fingers and toes have disappeared or have been reduced to "splint bones," but the remote ancestor of the horses must have had five toes. So far, this ancestry has been traced back to the four-toed stage. (See *Guide Leaflet* No. 36, *The Evolution of the Horse*.)

In the Horse Alcove is given a synoptic series showing the stages of evolution of teeth and limbs in the different geologic epochs and also a series of complete skeletons. These skeletons, including some of the finest ever unearthed, fully illustrate the various four-toed, three-toed, and one-toed stages and make it easy to follow the evolutionary changes that have taken place. Opposite the horse exhibit, in the first four alcoves on the other side of the hall, are specimens illustrating the evolution of the camel, deer, and other cloven-hoofed animals. Like the cow of to-day, these animals walk on the tips of the third and fourth toes, and the gradual reduction or disappearance of the other toes can be traced, much as in the horse. In addition to these, in the first alcove there is a unique skeleton of a giant flightless bird that lived at the beginning of the Tertiary Period, along with *Eohippus*.



EVOLUTION OF THE HORSE

The Ancestry of the Horse has been traced back through a long series of successive stages, represented by fossil skeletons found in the successive formations of the Age of Mammals, to small primate-like forms with four toes on the fore feet, three on the hind feet, with low-curved simple teeth, small brains, and various other features common to all primitive mammals.

- 1. Size of the brain and teeth (proportion of the skull).
- 2. Distribution of the leg bones.
- 3. Lengthening of the middle toe and the development of the hoof.
- 4. Reduction of the number of toes and the development of the hoof.
- 5. Increase in the size and complexity of the teeth.

PLEISTOCENE EPOCH

PLIOCENE EPOCH

MIOCENE EPOCH

OLIGOCENE EPOCH

EOCENE EPOCH

EVOLUTION OF THE HORSE

One of the panels showing the evolution of feet and skull

The series of camel skulls and skeletons is now being extensively studied and enlarged and will eventually form an evolutionary series comparable to that of the horse. The most interesting exhibit at present is the group of small camels in the central aisle. These graceful little animals, *Stenomylus*, lived in Nebraska at about the middle of the Age of Mammals. Four skeletons are shown exactly as they were found in the rock, and five others have been mounted in various living poses.

Among the other cloven-hoofed mammals, the so-called giant pigs or entelodonts and the oreodonts are especially noteworthy. The **Entelodonts and Oreodonts** oreodonts, a totally extinct group somewhat pig-like in appearance but with teeth more like those of sheep, are strikingly represented by three complete skeletons huddled together, still intact in the rock just as death overtook them millions of years ago.

Fossil rhinoceroses are shown near the center of the hall on the right. A fine series of skeletons illustrates the diverse types of American **Rhinoceroses** rhinoceroses, and a synoptic series shows the evolution of this group of mammals. The large block in the central aisle is from Agate, Nebraska, and contains heaped-up bones, chiefly of the pair-horned rhinoceros *Diceratherium*, still in the original rock as found. There are twenty-one skulls and innumerable other bones in this single block. Such great abundance of fossil bones is unusual, but it gives a graphic conception of the enormous numbers of prehistoric animals that once roamed over our West. Near this, in the center of the hall, is the skeleton of *Moropus*, one of the most extraordinary of mammals, of bizarre proportions and with great claws, although it belongs among the hoofed mammals and is related to the horses and rhinoceroses.

The ancestry of dogs, cats, and other living flesh-eating mammals and the various sorts of extinct carnivores is shown near the middle of the hall on the left. Complete skeletons of several **Carnivores** creodonts, very ancient carnivores of the beginning of the Age of Mammals, are particularly unusual.

Beyond the carnivores on the left are cases devoted principally to the smaller fossil mammals. Although fragmentary, these are among the rarest and most interesting fossils. The fossil **Primates and Small Mammals** (lemurs, monkeys, etc.) include unique specimens known throughout the world because of the light they cast on the earliest stages in the origin of man. Rodents (squirrels, rabbits, and their kin), insectivores (moles, hedgehogs, etc.), and marsupials (opossums, kangaroos, and their allies) are also typically represented here. Rarest of all fossils are the remains of the first mammals, those of the Age of Reptiles, before the Tertiary Period. (See also the tiny but priceless



HORNED DINOSAUR, TRICERATOPS

skulls in the next hall, found in Mongolia by the Central Asiatic Expeditions.)

At the end of the hall on the left are the remains of condylarths and amblypods, very ancient groups of hoofed mammals with no close relatives in the modern world. The most striking is the skeleton of *Uintatherium* in the last alcove, a six-horned amblypod that became extinct not long after the beginning of the Age of Mammals.

On the opposite side of the hall at the far end are the titanotheres, odd-toed hoofed mammals related to the horses and rhinoceroses. This group has also been long extinct but it includes some of the largest and strangest of mammals. Many general principles of evolution have been deduced from this splendid series by Professor Henry Fairfield Osborn.

The exhibit in this hall is made more life-like by plaster reconstructions of the animals and by sketches showing primitive horses in their environment. These paintings and models, as well as the murals and some other restorations in this hall, are by Charles R. Knight.

SOUTHEAST PAVILION HALL OF MONGOLIAN VERTEBRATES

In the center of this hall are exhibited fossils obtained by the Central Asiatic Expeditions. Here are the famous dinosaur eggs, and skulls of *Protoceratops*, probably the creature that laid them. Here also is the skull of *Andrewsarchus*, the largest of carnivorous mammals, and the skull and feet of *Baluchitherium*, a distant and ancient relative of the rhinoceros, larger than an elephant.

SOUTHEAST TOWER

One enters the Bashford Dean Memorial Exhibit of Fossil Fishes beneath a model of the jaws of an enormous fossil shark, some 9 feet across, with actual fossil teeth set in place. This monster, closely related to the modern White Shark or Man-eater, is estimated to have been 46 feet long.

At the far end of the exhibit is a "fossil aquarium"—restorations in miniature of various well-known forms from the Old Red Sandstone of Great Britain as they would have appeared in life, including *Coccosteus*, which represents a very ancient fish type, long extinct.

In the first alcove to the right, a wall chart illustrates the stream of fish life in geologic sequence, 500,000,000 years of fishes. It gives at a glance the basic arrangement of the specimens shown, notable among which are Ostracoderms from the Silurian and Devonian, the giant

Portheus and the saw-finned *Protosphyræna* from the Cretaceous of Kansas.

EAST WING

HALL OF DINOSAURS

On the right and left of the entrance are two good-sized, lightly but powerfully built, flesh-eating dinosaurs known as *Gorgosaurus*. As shown by their build and hollow bones, they were doubtless swift and fierce and preyed upon their smaller, feebler fellows as Lions and Tigers to-day prey upon Zebra, Antelope and Deer.

Near these are examples of a rather small dinosaur whose legs and general build suggest an Ostrich with a long tail, and called on account of this resemblance *Struthiomimus*.

Triceratops, big, lumbering, huge-headed, stupid creature, was a plant-eater, probably of coarse vegetation. His jaws ended, or began, in a great horny beak for clipping off branches and rushes, and his back teeth were adapted for champing them. These back teeth were arranged in many rows and were all the time pushed upward by new teeth forming below, so that as fast as teeth wore out they were replaced, a point in which *Triceratops* might well be envied. The fore legs, bowed outward at the elbows, enabled the animal to reach the ground with ease, and the big "frill," suggesting a fireman's helmet, was not alone for protection, but served as a counterweight to the head and jaws, so the skull almost balanced on the condyle, or ball joint by which it joined the neck.

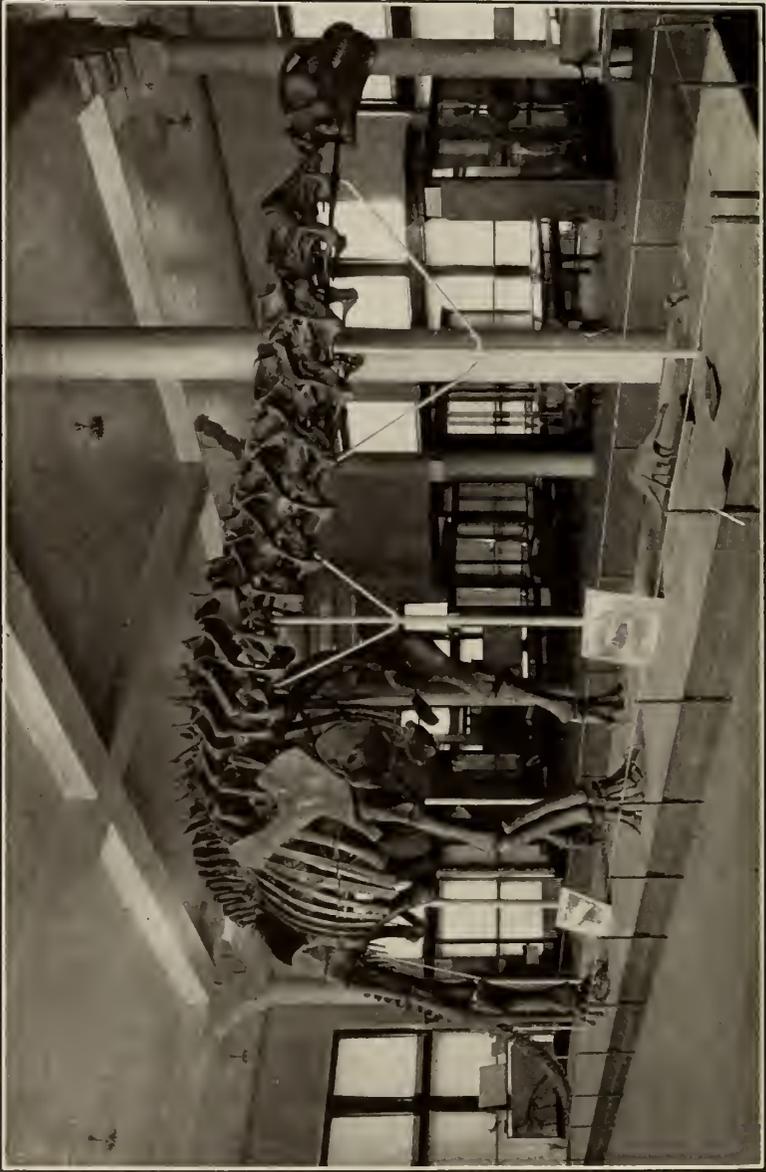
Across the way from *Triceratops* is a group of Dinosaurs which seem to have been very abundant in their day, *Trachodon* and his relatives. *Corythosaurus*, *Saurclophus*, and others. Among these is one of the rare prizes that sometimes fall to the lot of the collector, a specimen in which a large part of the skin has been preserved, so that we are certain as to the covering of the animal.

Towering above the others, his head eighteen feet from the ground, is *Tyrannosaurus*, the well-named King of Reptiles, whose terrible jaws and tremendous claws placed all contemporaries at his mercy, though a too careless attack on *Triceratops* might result disastrously.

Looming up in the distance is *Brontosaurus*, the Thunder Reptile, big-bodied, small-headed, with massive limbs, whose joints, in life covered with gristle, indicate that he was largely a water-dweller, where the great weight of his body, 25 to 30 tons, would be supported.



SOME OF THE FAMOUS DINOSAUR EGGS FROM MONGOLIA
Collected by the Central Asiatic Expeditions



BRONTOSAURUS

Near *Brontosaurus* is *Allosaurus*, apparently turned into a fossil while munching on the tail of a defunct relative of that big beast; looking closely, one sees that the tops of the vertebræ are scored with grooves where some millions of years ago it was feasted upon by some flesh-eating contemporary.

Two extraordinary armoured dinosaurs are represented by only parts of their skeletons. *Ankylosaurus*, which Dr. Lull has called "the most ponderous animated citadel the world has ever seen," had its head and body protected by thick plates of bone, while the tail, instead of tapering to a point, ends in a great ball of bone.

Beside *Ankylosaurus* is the fore part of *Palæoscincus* whose sides bristled with huge, bony spines and whose back was protected by bony plates so that he too was well able to defend himself.

(See also *Guide Leaflet No. 70, The Hall of Dinosaurs.*)

Return to the South Pavilion

SOUTH CENTRAL WING

GEOLOGY AND INVERTEBRATE PALÆONTOLOGY

Turning northward at the center of the Quaternary Hall, which contains the mastodons and mammoths, the visitor enters the *South Central Wing* of the building and is in the Hall of Geology and Invertebrate Palæontology.

GEOLOGY

Geology is the science of the past and present conditions of the earth. It enters into a consideration of the materials composing the earth, their composition, structure, distribution and the physical changes they have undergone or may be undergoing. It deals with minerals and their arrangement and association in rocks and ores. It considers the occurrence, distribution, origin and history of the principal kinds of rocks, namely: igneous, sedimentary and metamorphic. It especially treats of the order of deposition and sequence of the stratified beds of rock, for these, together with the fossils found in many of them, give not only a chronological account of the events in the development of the earth's crust, but reveal the succession of life forms on the earth. The processes and agents which are at work within and on the surface of the earth, tending to modify it, such as rock weathering, underground waters, glaciation, diastrophism, vulcanism, metamorphism and gradation, are forces which are acting to-day and have been acting throughout the long history of the earth. The processes of change are most conspicuous where air, water and rocks are in contact with one another.

The field of geology is so broad that, for convenience and specialized study, it has been divided into numerous branches. The three principal branches are: (1) Structural geology, treating of the form, arrangement and internal structure of the rocks; (2) Dynamical geology, dealing with the causes and processes of geologic change; (3) Historical geology, which, aided by other sciences, aims to give a chronological account of the events in the earth's history.

Subsciences may be also recognized, namely: *Cosmic* or *Astronomic* geology, which deals with the earth as a member of the solar system, its relation to other heavenly bodies and to meteorites (solid objects which fall upon the earth from outer space); *Mineralogy*, which deals with minerals; *Petrology*, the science of rocks; *Physiography*, which treats of present land forms; *Meteorology*, which is the science of the earth's atmosphere; *Hydrology*, including Oceanography, which treats of the liquid formations of the earth, or the hydrosphere; *Paleontology*, the study of the remains and impressions of plants and animals of past ages that are found in the rocks; and *Paleogeography*, the study of the physical geography of past periods of the earth's history. Besides these general subdivisions, there are special applications of geologic knowledge which give rise to other terms, such as Economic geology and Mining geology.

To illustrate the three principal branches of geology, fifteen areas within the United States have been selected, and they are presented as illuminated topogeologic or relief map models with structure sections and backgrounds in color. They show the most evident and striking results of geologic forces acting through long periods of time. Beginning at the left near the entrance, they are as follows:

1. The model of the Bright Angel section of the Grand Canyon of the Colorado River, Arizona. The scale, 1:12,000, is large enough **Topogeologic Models** to give a vivid idea not only of the extensive erosion that has taken place, but also of the geological formations. These features are so plainly exposed in beautiful colors that the Grand Canyon is one of the great wonders of the World.

2. A model of the Niagara Falls region, built to the same scale as the Grand Canyon, showing the falls and the seven-mile gorge which its waters have cut in ancient sedimentary rocks, and also the more recent glacial deposits covering the surface.

3. The Potomac River section, showing the Appalachian Mountain type of folding and erosion, with rivers adjusted to the softer rocks of Silurian and Devonian age.

4. The Van Horn, Texas, region, featuring fault block structures and a bolson basin—a depression nearly enclosed by mountains.

5. Yellowstone Park, Wyoming, including the geyser basins and Rocky Mountain type of topography.

6. The Pike's Peak, Colorado, model, showing the mountain composed of red granite, and the bordering stratified deposits of the Great Plains near Colorado Springs.

7. The caldera of Mt. Mazama, five miles in diameter and two thousand feet deep, which has been made a National Park, and has become famous under the name Crater Lake. Numerous outpourings of lava suggest the structure and history of the ancient volcano.

8. The Standing Stone district near Monterey, Tennessee, showing normal subaërial erosion and the production of sink holes in horizontally disposed beds of limestone and shale.

This concludes the series of such models on the west side of the hall. Crossing to the east aisle, one may note additional models, namely

9. The Mt. Tom-Mt. Holyoke district of western Massachusetts, showing a great trough, traversing the ancient crystalline rocks, which was filled with the sands, muds and intruded lava flows in Triassic time.

10. The Watkins Glen-Seneca Lake district of central New York State, showing moraine deposits and other features due to the advance and retreat of the continental ice sheet over a region of horizontally bedded limestone, sandstone and shale; in the background appears a representation of the retreating ice-front of the last glaciation.

11. The Mt. Washington, New Hampshire, region, showing typical glacial cirques and other glacial phenomena in an area of crystalline rocks.

12. The picturesque Yosemite Valley in the Sierra Nevada Mountains of California, with U-shaped glaciated valley bottom and precipitous marginal walls.

13. The San Francisco, California, model, exhibiting a portion of the Pacific Ocean, the Coast Range with volcanic and sedimentary rocks, the California trough or inner lowland with plains bordering San Francisco Bay, and the famous strait, Golden Gate.

14. The New York City model, showing the Hudson River estuary, the crystalline pre-Cambrian rocks on Manhattan Island to the north and east; the Triassic rocks west of the Hudson, which include red sandstone, shale and conglomerate, the Palisades diabase and the Watchung basaltic ridges, also the glacial drift and terminal deposits on Long Island, on Staten Island, and in New Jersey.

15. The last model in this series is one of Porto Rico and the Virgin Islands, showing a narrow submerged platform and neighboring vast oceanic "deeps."

Facing the entrance of the Hall is a large-scale model of the Panama Canal.

At the entrance to each of the eight alcoves on the west side of the hall is placed a model which outlines a stage in the geographic development of the North American continent. The stages represented fall within the following named periods of geologic time: Cambrian, Ordovician, Silurian, Devonian, Permian, Cretaceous, Eocene and Pliocene. On each model, the present known surface outcrops of fossiliferous rock of the age represented, are shown in black. It is from this evidence and other contributing data that the extent of the ancient epicontinental seas has been determined and the shore-lines marked. On these models the present oceanic depths are shown in relief, while the various marine basins and elevated land masses on the continent are marked with colors without relief. It may be noted, by comparing these palæogeographic maps with the present outline of North America, which is shown on each model, that the geography during the first six periods was quite different from that of to-day. Nevertheless, the marine inundations and subsequent depositions were contributory factors in the upbuilding of the great continent of North America.

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 skilful 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 buildings over four of the principal mines (Holbrook, Spray, Gardiner 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 the depth of about 1,200 feet, illustrating the geology of the area and showing the general manner of getting out the ore and hunting for new deposits. There were 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%, which yielded: Copper—1,106,605,775 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 "stopping." Drilling, picking, timbering, filling old cavities, transporting, raising ore to the surface, and other operations are illus-

trated 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.

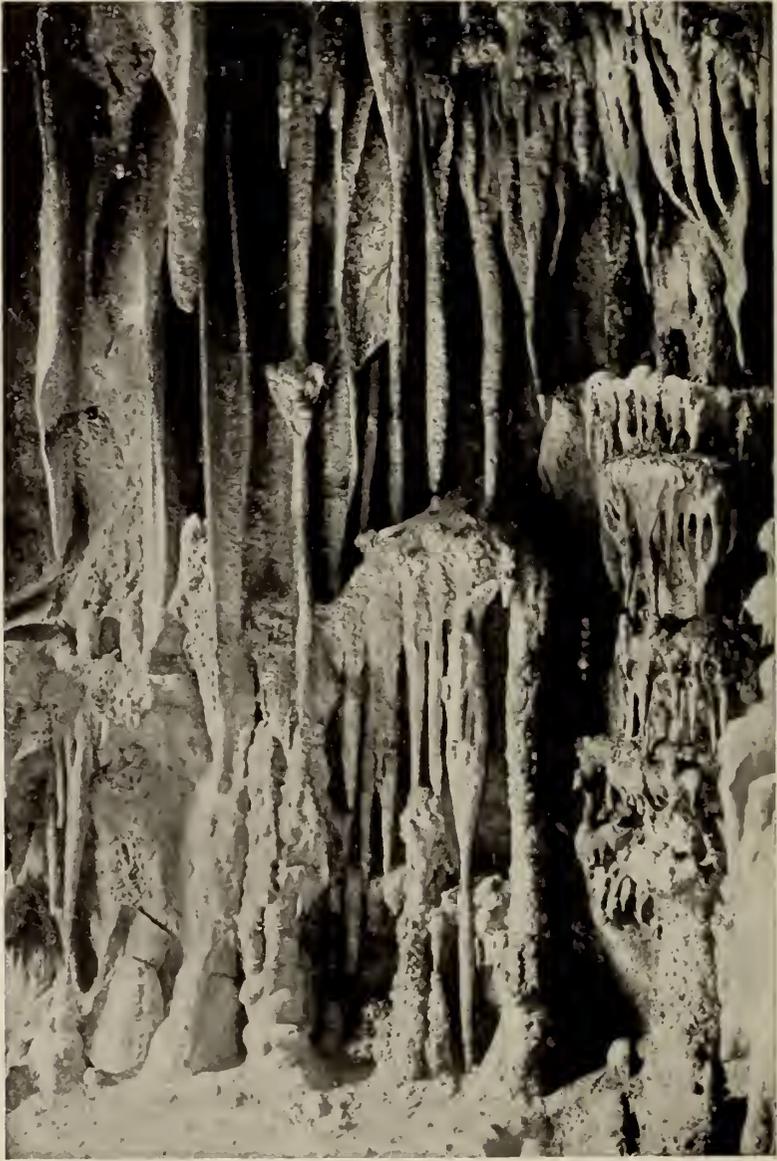
Specimens of ore, minerals and rocks from the mine and the adjacent country illustrate the geology of the region. Chief of these specimens are, velvet malachites that were taken from the original "Queen" mine, the Open Cut, in the early eighties, and a great block of malachite and azurite weighing about three tons taken from the mine in 1892 and included in the Arizona mining exhibit at the Columbian Exposition in 1893.

The northwest corner of the hall contains a display of caves and cave material, including a reproduction of part of a beautiful cave that was discovered early in 1910 in mining operations at the Copper **Caves** 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 dazzlingly white while others are colored green with copper salts or pink with manganese compounds.

Alongside the Copper Queen cave is a reproduction of a chamber in Weyer's Cave, Virginia. 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, and this exhibit illustrates not only the great variety in form but the reasons for this extraordinary diversity.

INVERTEBRATE PALÆONTOLOGY

Closely connected with geology, and indeed almost inseparable from it, is palæontology, or the study of ancient forms of life. The sedimentary rocks have been found, on examination, to contain in many places remains of plants or animals, which may closely resemble, but more often appear very different from, those now living on the earth. The order of deposition of the beds, with the oldest at the bottom and the youngest at the top, and the imbedded fossil forms of life, give the geologist the means of constructing a chronological chart, or time scale, depicting the eras, periods, epochs and formations of geologic time. There are five eras: Archæozoic (Primal life), Proterozoic (Primitive life), Palæozoic (Ancient life), Mesozoic (Medieval life), and Cenozoic (Modern life). The rocks of the Archæozoic era have not afforded recognizable fossils, although the indirect evidence is sufficient to assume that life existed at that time. In a few localities, fossils, as highly developed as eurypterids, have been obtained from the rocks of late Proterozoic age, as in Montana and southern Australia. Beginning with the basal period of the



A BIT OF WEYER'S CAVE

Part of the section reproduced in the Hall of Geology

Palæozoic era, the Cambrian, well preserved fossils indicate that all of the various classes of invertebrate life were in existence, but not so abundant and varied as in later periods. The earliest known forms of vertebrate life are the fossil fishes from the upper Ordovician rocks of Colorado.

The exhibits of Invertebrate Palæontology include a central row of cases containing type and figured specimens, a stratigraphic or historical series on the west side of the hall, and a biologic series on the east side, as follows:

In the desk cases down the center of the hall are about 8350 type and figured specimens used by James Hall, R. P. Whitfield and others in the original description and naming of species, or in their **Types** further elucidation. The specimens have been arranged in biologic order under geologic periods as entered in Volume XI of the Museum *Bulletin*.

The specimens in the cases on the left or west side of the hall are arranged to illustrate Historical geology, beginning at the south (entrance) with the Archæozoic rocks, which are the lowest **Historical Geology** and oldest of all and contain no fossils, and advancing regularly through the Proterozoic, Cambrian, Ordovician, Silurian, Devonian, Mississippian, Pennsylvanian, Triassic, Jurassic, Comanchean, Cretaceous, Eocene, Oligocene, Miocene, Pliocene and Pleistocene periods of geologic time. Most of the specimens on exhibition are from American localities, and the species are arranged with the lower, or simpler, forms placed first. The specimens shown are those particularly characteristic of the various horizons, the object being to give an idea of the general character of the life of different periods of the world's history.

The specimens on the east, or right, side are arranged to illustrate biologic geology, the classification and relationship of the plants and **Biologic Geology** animals of past geologic times. The series starts with the plants and is followed by the various subdivisions of the invertebrate animals, beginning with the lower, or simpler, forms and continuing to the highest. The order of arrangement under each class name, which is entered at the top of each case, is that found in the Zittel-Eastman text-book of Palæontology, 1913. The specimens have been drawn from foreign and domestic localities and different geologic ages. The exhibits illustrate at a glance the wide range of variation which each group has taken during geologic time.

In the first alcove on the right are 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 it was discovered only through the chance visit of a miner.

Two stumps of a large fossil tree-fern of Middle Devonian age from Gilboa, N. Y., appear at the entrance to the alcove. These specimens were obtained from a quarry opened in connection with the great engineering work of the New York City Board of Water Supply. These are the oldest trees known.

Return to the South Pavilion

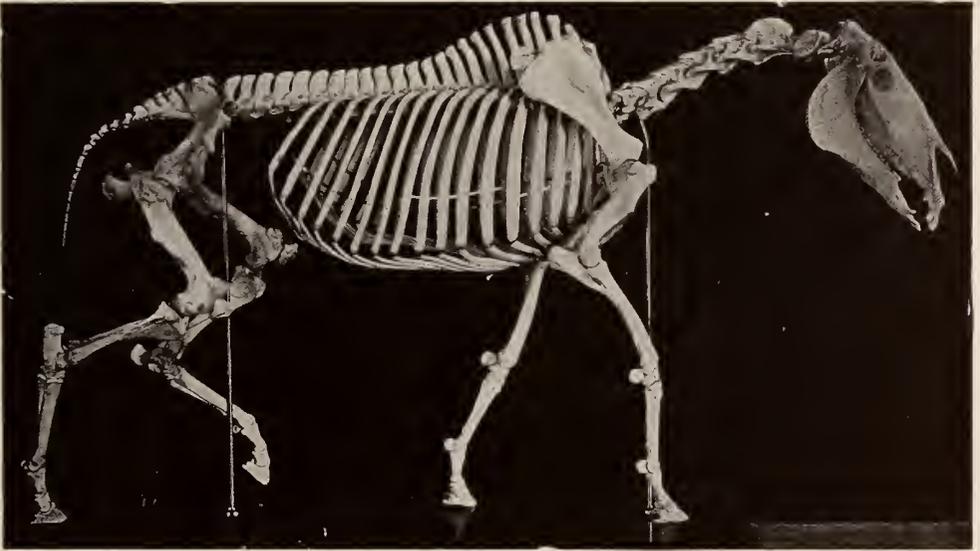
WEST CORRIDOR

THE HORSE UNDER DOMESTICATION

This hall is devoted to exhibits illustrating the great modifications that man has brought about by selection in adapting the horse to his various needs.

Under his management speed has been increased in the race horse, weight and strength in the draft horse, while for purposes of pleasure the Shetland Pony has been reduced to a diminutive size. The great modifications in the skeleton that have accompanied these changes are well shown in the series of beautiful skeletons, while other exhibits illustrate the structure of the skull and teeth and the changes that take place with age.

**Skeletons
of Modern
Horses**



DRAFT HORSE, PULLING A HEAVY LOAD

The similarity in structure (homology) of the skeletons of horse and man is brought out in the exhibit of a rearing horse, controlled by man. A comparison will show that although very different in proportions the bones of the one correspond with those of the other.

There is also a skeleton of a Russian Wolf-hound and a few smaller types for comparison.

The collection includes some noteworthy horses such as Sysonby, Lee Axworthy and the Arab stallion Nimr.

SOUTHWEST WING
MINERALS AND GEMS

The southwest wing comprises the Morgan Memorial Hall of Minerals and Gems. This hall, through the gift of Mr. George F. Baker, has been remodeled to contain the General Collection of Minerals and the Morgan Gem Collection, thus constituting a memorial to the great services of Mr. J. Pierpont Morgan as a Founder and Benefactor of the Museum.

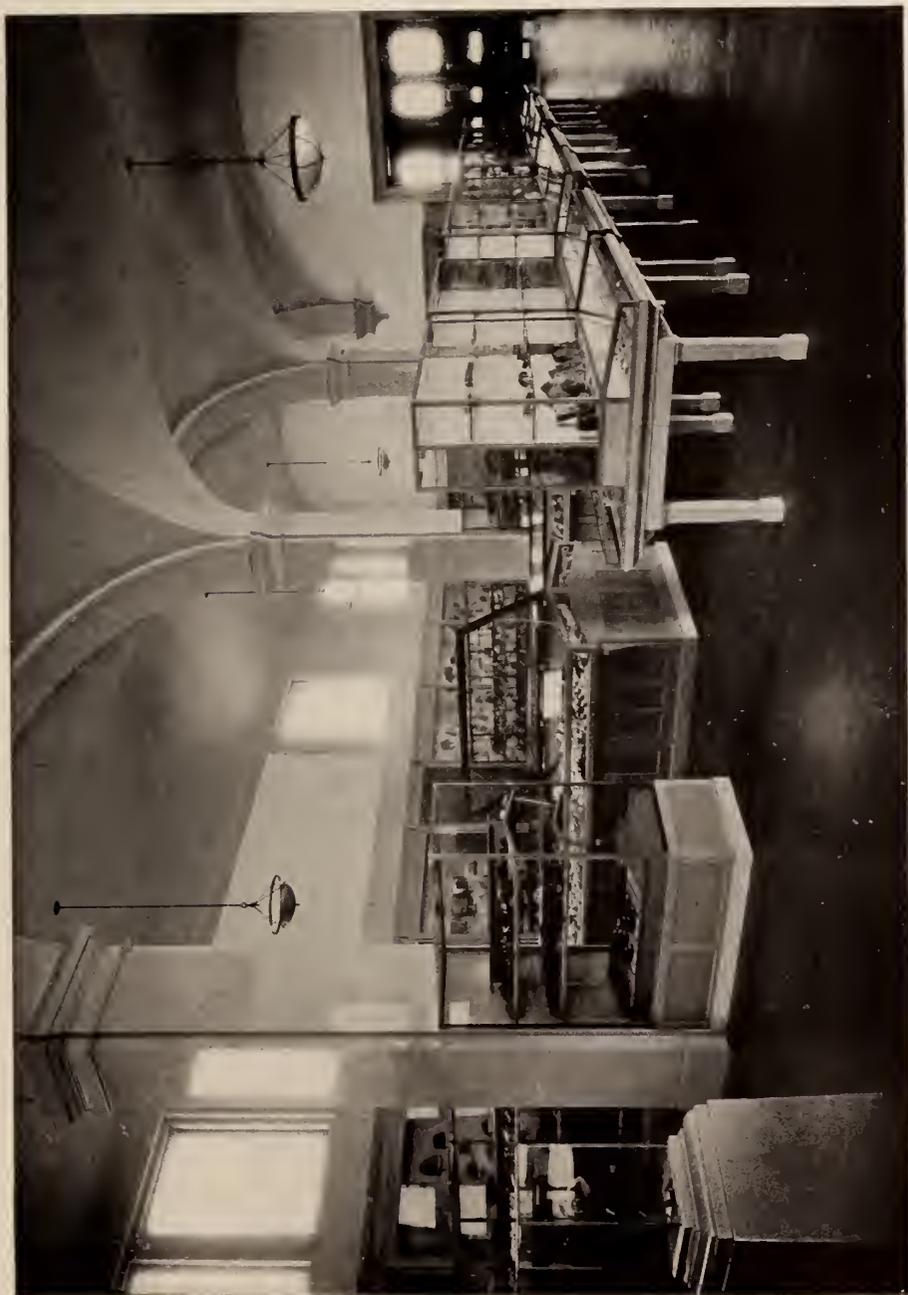
Of these, the General Collection of Minerals is without question one of the finest mineral collections to be found in the world, ranking with that of the British Museum and the Jardin des Plantes. It is composed chiefly of the well-known Bement Collection, presented to the Museum in 1900 by the late Mr. J. Pierpont Morgan. Although remarkably complete in its representation of most of the mineral species known to science, this collection is especially noteworthy for its assemblage of splendid examples of the commoner and more widely distributed minerals.

The visitor should begin with the first of the cases, to the left of the entrance, and proceed from left to right along each side of every case, advancing through the south row of cases and returning through the north row. The different species are divided within the case by narrow strips between the mounts. The large and imposing specimens are arranged in wall panels around three sides of the Hall, and constitute a Key Collection. To the right of the entrance will be found cases in which the subject of Crystallization is presented by a series of models. This series, as well as other explanatory exhibits in adjoining cases, constitutes an important key to the understanding and appreciation of the general mineral collection.

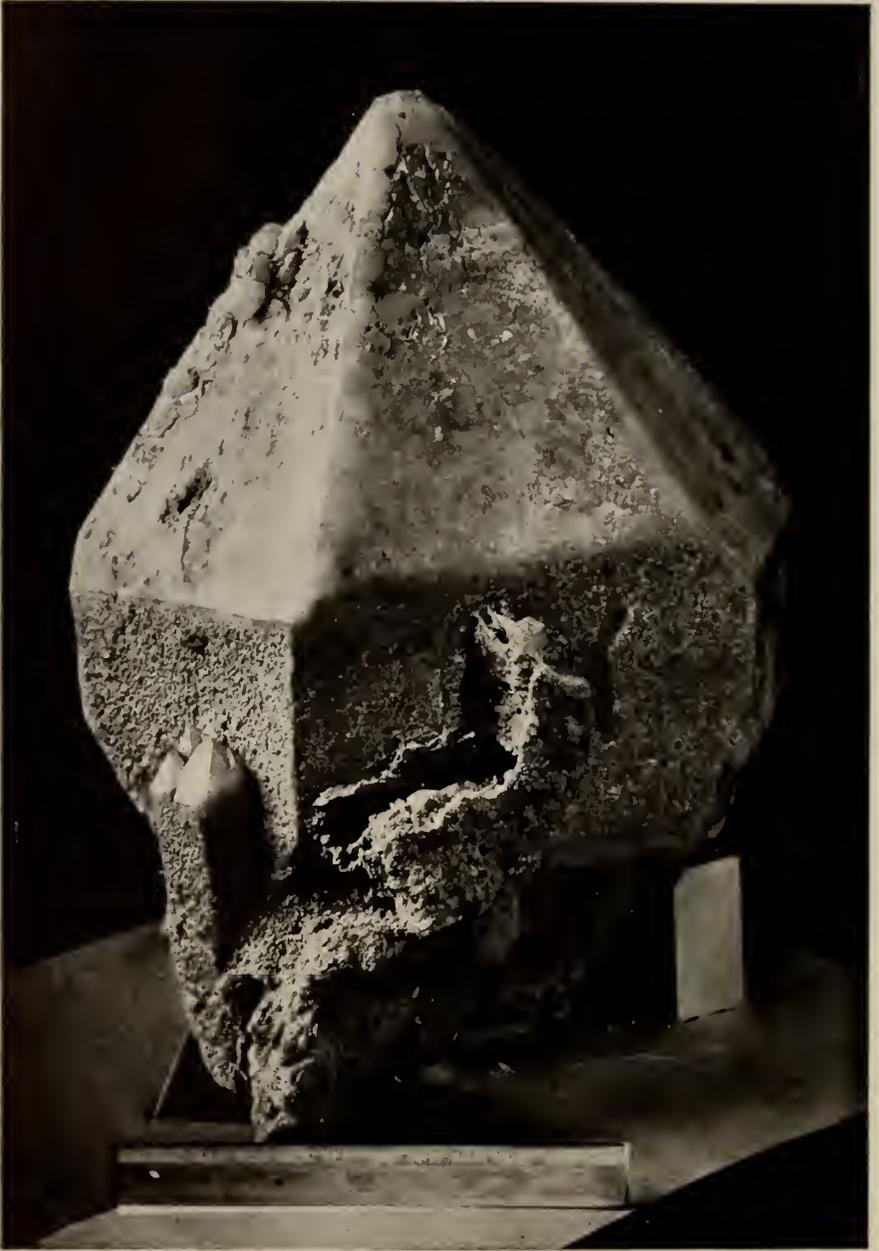
The cases occupying the middle of the hall contain the Morgan Gem Collection, comprising the valuable series of gems and precious stones also presented by J. Pierpont Morgan, to which have been added from time to time noteworthy specimens given by other friends of the Museum.

The Morgan collection includes the series of American gems assembled by Tiffany and Company for the Paris Exposition of 1889 and the series of foreign gems and gem stones exhibited at the Paris Exposition of 1900.

The installation comprises examples of those minerals which are used for gems and for ornamental objects and consists of rough, uncut material and of fashioned gem stones and carved objects. All of the specimens exhibited have been chosen with great care and are not only thoroughly representative but include many examples which are unique in size, beauty of coloring and perfection of execution, reflecting the very highest standards of the art of the lapidary. Here again explanatory labels are



MORGAN MEMORIAL HALL OF MINERALS AND GEMS



QUARTZ CRYSTAL

A single crystal from Auburn, Maine, of quartz, measuring $26 \times 19 \times 13$ inches and weighing 253 pounds.

used to give meaning and weight to the exhibit, not merely as a display of jewelry material but as a complete visual exposition of the knowledge of gem stones.

The visitor should proceed from the entrance along the north row of cases, returning along the south row. The case containing the Sapphires and Rubies, near the beginning of the series, presents a particularly fine display of these gems. Close by will be found a large and varied assemblage of Aquamarines embracing many gems of exceptional size and color. The cases devoted to Rock Crystal contain a number of carved and engraved objects of rare beauty and value. The handsome semi-precious stone Kunzite is represented by especially large and fine examples to be found toward the middle of the series. An interesting exhibit illustrating the primitive and antique use of gems is displayed in cases in the south row near the entrance. This includes many engraved cylinders of great age and the famous Babylonian ax-head of banded agate. An exquisitely carved statuette of blue Chalcedony, the gift of Mr. Charles Lanier, will be found in the center of the installation. There is also the second largest boulder of jadeite yet discovered.

SOUTHWEST PAVILION

COLLECTIONS FROM THE PACIFIC ISLANDS

On entering the *Southwest Pavilion* beyond the Hall of Minerals the visitor faces groups representing the natives of the Pacific Islands. Directly in the center is a Tahitian priest taking part in the fire-walking ceremony, in which the participants walk over heated boulders of lava. On each side is a group showing natives engaged in typical activities,—grating cocoanut, preparing kava, or plaiting pandanus.

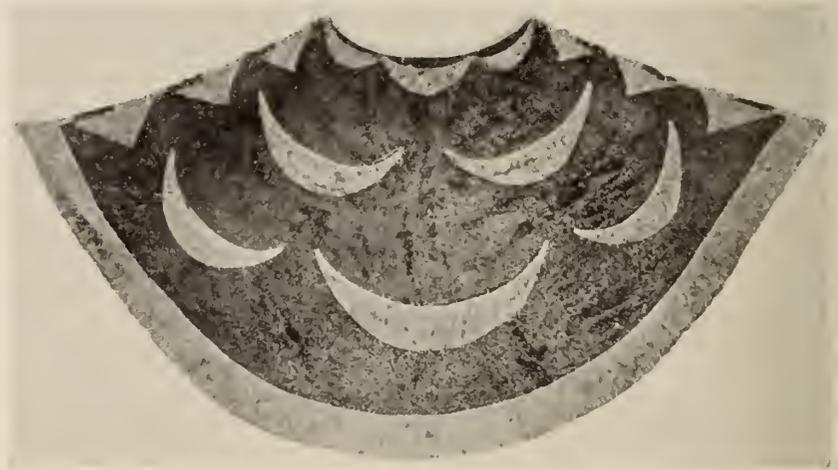
Near the entrance is a fine Hawaiian feather cape, such as was formerly worn by the highest ranks of Hawaiian society. Red and yellow honeysucker feathers completely hide the netted twine foundation. The value of these garments was proportionate to the enormous labor expended on their manufacture.

The hall is roughly divided into two main sections. In the eastern half are exhibited the collections from Polynesia and Micronesia, while the western half is devoted to New Guinea, Melanesia and Australia. However, it proved impossible to be wholly consistent and to separate Melanesian Fiji from Samoa and Tonga.

In the Polynesian section the examples of decorated native bark cloth (tapa) are especially noteworthy, and a number of canoe models remind us that these people are daring seafarers. A series of ceremonial

adzes from the Cook Islands in the northeastern quarter of the hall shows aboriginal carving at its highest level.

In the western section the elaborately carved sacred masks, about 14 feet back of the Tahitian priest, illustrate the æsthetic tendencies of Melanesia, which are also apparent in a carved pole set on top of a vertical case. Very different from these artistic manifestations are the carvings of the New Zealanders (Maori) characterized by the dominant spiral motive. A series of dried and tattooed Maori heads forms one of the most remarkable exhibits in the Museum. (See *Guide Leaflet No. 71, The Maoris and their Arts.*)



HAWAIIAN FEATHER CLOAK

Near the boundary between the two main sections are the Australia cases with numerous boomerangs and very crude stone tools, which should be compared with those in the archæological hall (p. 80). The southwest corner is devoted to a collection from the Admiralty Islands, including a model of a village of the Manus tribe, a lagoon-dwelling, fishing people who build their houses on piles far from land. In the northwest corner of the hall are shields, clubs, carvings and household utensils from New Guinea.

SOUTHWEST TOWER

The Isaac Wyman Drummond Collection of carved jade, amber and ivories, and skilfully wrought bronzes, has recently been installed in the Southwest Tower.

WEST WING
**COLLECTIONS FROM NEW GUINEA, PHILIPPINES AND
MALAYSIA**

In the hall due North of the Pacific Islands Hall, the side aisles are devoted to the Philippine Islands. The northern section of the hall contains exhibits from other parts of Malaysia with an interesting series of marionettes from Java. The entire central section of the hall is filled with a special exhibit of new material from New Guinea. The painted modeled skulls decorated by the head-hunting Tehambuli tribe, the incised work in cocoon shell and cassowary bone, and the great diversity of ceremonial masks and religious paraphernalia are particularly interesting.

At the right of the entrance is a case containing life casts of faces, nose and hair from the different races represented in this hall. Also charts of stature and head form, with distribution maps. (*See Handbook No. 8, The Peoples of the Philippines.*)

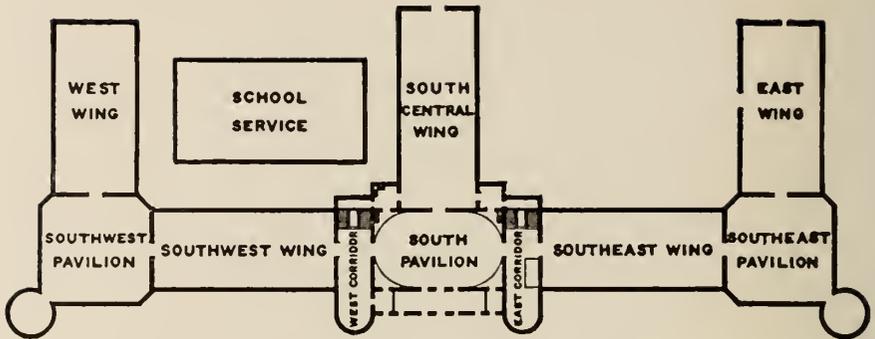
In the center is a model of a Filipino bamboo-walled and thatched-roofed house; at the far end a native tree house dominates the scene; and on your left may be seen the model of a woman weaving a garment on a native loom.

The visitor should note that, like the African Negroes, but unlike all other primitive stocks, the Malayan tribes represented in this hall used iron tools. The numerous iron weapons—spears, battle-axes, and kris (daggers with serpentine blades)—are especially remarkable.

On the west side of the hall will be found a number of synoptic exhibits of native kris, shields, fabrics, basketry and ceramics. Pottery is not highly developed in this area, but the textile arts flourish to a remarkable degree. The industrial life of the Bagobo of Mindanao is particularly well illustrated in the collections.

Much more primitive in their culture than the other Malaysians are the Negritos, a dark-skinned and frizzly-haired pygmy stock forming with similar groups in other parts of the world a distinct division of the Negro race. They are everywhere hunters, using the bow and arrow, and ignorant of agriculture. Their simple implements are shown in a table case in the northeastern section of the hall.

Return to the South Pavilion



FIFTH FLOOR

LIBRARY, OFFICES, LABORATORIES, AND STUDY COLLECTIONS

The fifth floor is given over to the administrative offices, the offices and laboratories of the scientific departments, and the library.

On this floor 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. In other rooms the varied work of preparing exhibits requires the services of a considerable number of artists and artisans.

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

WEST CORRIDOR

LIBRARY

The Library, as might be inferred, is devoted to works on natural history, anthropology and travel. It contains some 110,000 volumes which comprise not only the important periodicals of our own and foreign countries but also all representative and standard works on zoology, physical anthropology, ethnology, prehistory, archæology, geology and palæontology. The collection on vertebrate palæontology forms the Osborn Library of Vertebrate Palæontology, founded by President Henry Fairfield Osborn. It is located in the southeast wing.

The Reading Room of the Library is located in the west corridor and is open to the public from 9 A.M. until 5 P.M. except on Sundays and holidays; the Library is also closed on Saturdays from June to September. Those interested in consulting the books and periodicals are welcome to do so during these hours.

Twelve reading tables have been placed in various halls of the Museum, whose specially designed cases contain books pertinent to the exhibits. These may be consulted by applying to the guard.

PUBLICATIONS

The publications of the Museum fall naturally into two groups: technical and popular.

The former, comprising the *Anthropological Papers*, *Memoirs*, *Bulletin*, and *American Museum Novitates*, contain information gathered by the various expeditions, or derived from the study of material collected. The *Anthropological Papers*, as the title implies, are devoted to researches carried on under the auspices of the Department of Anthropology. The *Memoirs*, quarto in size, contain monographs, many of which demand large illustrations. The *Bulletin* contains the longer scientific papers, covering records of explorations and collections of the Museum. The *Novitates* comprise the shorter scientific contributions, descriptions of species, etc., which demand immediate publication. The scientific publications are distributed to libraries of scientific institutions and societies throughout the world, largely on an exchange basis.

The popular publications include *Natural History* (Journal of The American Museum), *Guide Leaflets*, *Handbooks*, *General Guide* and *School Service Series*, and are intended for the information of the public. *Natural History*, begun as The Journal 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 important information gathered. It describes interesting or noteworthy installations, and notes the accessions to the various departments, changes in the personnel of the Museum, and elections to Museum membership. In addition it contains articles of popular scientific appeal. The illustrated *Guide Leaflets*, eighty-two of which have been published, deal with exhibits of particular interest or importance, such as the Habitat Groups of Birds, the Evolution of the Horse, Meteorites, Indians of Manhattan, calling attention to important objects on exhibition and giving information in regard to them. The *Handbooks*, twelve of which have been issued, deal with subjects illustrated by the collections, rather than with the objects themselves. They are frequently used as text-books. Thus, the *Indians of the Plains*, 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 organizations, religious beliefs and ceremonies.

The distribution of these popular publications is a part of the educational work of the Museum, as are exhibits and lectures, and they have been sometimes sold below the cost of publication, as is done by other museums. (See list at back of Guide.)

An *Annual Report* is issued yearly.

STUDY COLLECTIONS

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 they 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. 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:

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

Mineralogy

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; a large series of rocks, from Mongolia; many ores and economic specimens.

Geology

The study collections comprise over 30,000 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, carnivores, Fayûm, Pampean, Asiatic and Patagonian mammals, Jurassic dinosaurs, Permian reptiles, turtles, etc., are likewise of the first rank. They include more than one thousand type specimens of fossil mammals and several hundred type specimens of fossil reptiles and amphibians. The fossil fishes are at present in the Department of Ichthyology.

Vertebrate Palæontology

Great numbers of fossil invertebrates, representing many important groups and including a large number of types: foremost among these is the James Hall collection of New York State fossils which contains about 8,350 types. The catalogued collection of fossil invertebrates includes some 22,000 species, embracing some 700,000 specimens.

Invertebrate Palæontology



HOW SPECIMENS ARE CARED FOR
How skins of Mammals are stored



THE NEW STUDIOS OF THE DEPARTMENT OF PREPARATION AND EXHIBITION

On the three top floors of the new Power Plant is centralized all preparation work.

About 75,000 specimens of protozoans, sponges, polyps, starfishes, sea urchins, worms, crustaceans, myriapods and chordates. The **Living Invertebrates** collection of recent mollusks comprises about 25,000 species, including especially the Stewart, Jay, Constable and Haines collections and large series from Africa.

The insects and spiders forming our general collection consist of more than 1,000,000 specimens; among them the types of many species.

Entomology Many students in this branch of natural history visit our laboratories in the course of a year to take advantage of the collection.

The fishes comprise about 10,000 specimens, mainly preserved in alcohol; among them many fresh-water fishes from Africa, **Ichthyology** including about 100 types, and good series from China.

The fossil fish collection is one of the largest, if not the largest, in America, comprising about 10,000 catalogued specimens; it includes the collection of Palæozoic fishes, especially arthrodires, made by Professor J. S. Newberry, and a series of fossil fishes from Europe and North America.

Herpetology The collection of frogs, salamanders and reptiles numbers about 90,000 specimens.

With the recent acquisition of the famous Rothschild collection from Tring Museum, a balanced representation of the birds of most of the world is now at hand in the study material, **Ornithology** though the Rothschild collection is not as yet arranged in available form.

The North American collection has important series from the Middle Atlantic States, California, Texas, and Arizona; also Mexico, Guatemala, Nicaragua and Panama. South America is represented by collections from Colombia, Ecuador, Peru, Venezuela, Argentina, Paraguay and Brazil.

There are fine collections from different parts of Africa, the Brehm collection of European birds, the Mathews collection of Australian species, part of the Buller collection from New Zealand, the Whitney collection of South Sea Island birds, Whitehead's Philippine collection, the Lawrence, Maximilian and Verreaux collections, large series of sea birds, and extensive representations of the birds of Indo-Malaya, Persia, Galapagos Islands, Hawaii and many other regions are of extreme importance and often of additional historical significance.

Aside from the mammals of North America, great and small, the **Mammalogy** collection includes extensive series from South America; Asia, particularly Mongolia; Africa, especially the Congo region, and Australia.

The study collection comprises a large number of preserved specimens of many kinds of animals suitable for comparative anatomical investigations, and a general osteological collection for the use of research workers and postgraduate students.

Comparative Anatomy The human skeleton material includes the large Felix von Lusehan collection, representing the racial types of existing man, and in addition a number of special collections from the American Indians.

Anthropology The ethnological study collections comprise extensive series from the Pacific Islands, Philippine Islands, Siberia, China, Central and South Africa and the various culture areas in North America.

In archæology there are large series of characteristic stone objects from the various states of the union. There are full collections from excavated sites in California, New York, Georgia, Kentucky, Tennessee, Arizona, and New Mexico, and a special series from the Trenton Valley. There is also much material from Mexico, Bolivia, Peru, Europe and China.

The Museum Library, located on the fifth floor, contains about 110,000 volumes on various branches of natural history (except botany), anthropology and travel. It has an unusually fine collection of scientific periodicals and standard classics. Like other museum libraries, it is of necessity adapted for reference only, but may be consulted freely by the public during the hours that the Museum is open, except on Sundays and holidays; the Library is also closed on Saturdays from June to September. The Osborn Library, founded by President Henry Fairfield Osborn, is also on the fifth floor and contains all the important works on vertebrate palæontology.

An important part of the Museum, not seen by the public, is the workshops, 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.

Workshops Another most important part is the fully equipped printing establishment where most of the printing of the Museum is done.

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 accessories¹ for beasts, birds and fishes, to say nothing of reptiles and

¹See Guide Leaflet No. 54.

amphibians, and here, with painstaking care, are slowly created in glass and wax the magnified copies of invertebrates.

From all this 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.

POPULAR PUBLICATIONS

Relating to the Exhibits or to the Work of the Museum

These are plainly written accounts of the exhibits or of the subjects illustrated by the exhibits and are intended to give much more information than could be put on labels.

They may be purchased at the Sales Booth in Memorial Hall or from the Librarian.

Leaflets and Handbooks not included in this list are out of print and, in most cases, will not be reprinted. Copies may be consulted, however, in the Museum Library.

Prices are net; postage is extra (3 cents for each Leaflet and 10 cents for each Handbook).

Mail orders should be accompanied by money orders, checks or stamps (not cash), to cover the purchase price and mailing cost, and may be addressed to

THE LIBRARIAN

The American Museum of Natural History
77th Street and Central Park West
New York, N. Y.

HANDBOOKS

These deal with subjects illustrated by the collections, rather than with the objects themselves. They are frequently used as text-books.

No. 1. North American Indians of the Plains. BY CLARK WISSLER, Ph.D., Curator-in-Chief, Department of Anthropology. Third Edition. September, 1927. 172 pages, maps and illustrations. Cloth, **75 cents**.

This gives an account of the Material Culture, Social Organization, Religion, Ceremonies, Art and Languages of the Plains Indians of North America.

No. 2. Indians of the Southwest. BY PLINY EARLE GODDARD, Ph.D., Third Edition. July, 1927. 201 pages, maps and many illustrations. Cloth, **75 cents**.

A résumé of our present knowledge of these interesting Indians. Among the subjects treated are the Spanish Conquest, Cliff Dwellings, Native Weaving, the Potter's Art and the Hopi Snake-Dance.

No. 3. Ancient Civilizations of Mexico and Central America. BY HERBERT J. SPINDEN, Ph.D. Third Edition, revised and enlarged, September, 1928. 270 pages, 75 illustrations. Cloth, **\$1.00**.

Intended as a general commentary and explanation of the more important phases of the ancient life and history of the Indians of Mexico and Central America, popularly considered as Aztecs, but actually including a number of distinct though related races, notably the Maya.

- No. 4. *Animals of the Past.*** An account of some of the Creatures of the Ancient World. BY FREDERIC A. LUCAS, Sc.D. Seventh and enlarged edition. July, 1929. 221 pages, numerous illustrations. Cloth, **75 cents.**
Tells of the mammoth and mastodon, of the giants among birds, the sea lizards, the huge dinosaurs and other creatures of the past.
- No. 8. *Peoples of the Philippines.*** BY A. L. KROEBER, Professor of Anthropology, University of California. Second and revised edition. October, 1928. 224 pages, maps and illustrations. Cloth, **\$1.00.**
Their Religion, Arts, and Occupations.
- No. 9. *Birds of the New York City Region.*** BY LUDLOW GRISCOM. November, 1923. 400 pages, map and illustrations. Cloth, **\$1.00.**
Gives detailed information about the birds of this region and tells where and when they are to be found.
- No. 10. *Indians of the Northwest Coast.*** BY PLINY EARLE GODDARD, Ph.D. August, 1924. 176 pages, many illustrations. Cloth, **75 cents.**
Tells of the customs, religion and art of these expert workers in wood and carvers of totem poles.
- No. 11. *Old Civilizations of Inca Land.*** BY CHARLES W. MEAD. December, 1924. 117 pages, many illustrations. Cloth, **65 cents.**
Describes the arts and industries of the highly civilized Incas, their marvelous textiles and extraordinary skill in stone work.
- No. 12. *The Story of the Minerals.*** BY HERBERT P. WHITLOCK, C.E., Curator of Mineralogy. December, 1925. 144 pages, colored frontispiece and many illustrations. Cloth, **75 cents.**
Puts into simple form the "How?" and the "Why?" of mineralogy.

ILLUSTRATED GUIDE LEAFLETS

These describe some exhibit, or series of exhibits, of special interest or importance, or may deal with the contents of an entire hall.

- No. 28. *The Habitat Groups of North American Birds.*** BY FRANK M. CHAPMAN, Curator of Ornithology. Fifth edition. 1930. 66 pages, 36 illustrations. Price, **25 cents.**
These celebrated groups are designed to illustrate not only the habits but also the haunts, or habitats, of the species shown. The backgrounds are careful studies from nature and each represents some definite locality. Twenty-eight of these groups are shown in this leaflet.
- No. 36. *The Evolution of the Horse in Nature and under Domestication.*** BY W. D. MATTHEW, Ph.D., and S. H. CHUBB. Fifth revised edition. June, 1927. 67 pages, 39 illustrations. Price, **25 cents.**
The geologic history of the Horse affords the most complete and convincing illustration of evolution among mammals. This leaflet, based upon material in this Museum, describes the successive stages in its evolution from the four-toed "Eohippus no bigger than a fox" to the single-toed horse of to-day.

- No. 38. Our Common Butterflies.** By F. E. LUTZ, Curator of Entomology, and F. E. WATSON. Fifth and revised edition. May, 1926. 20 pages, two color plates and many illustrations. Price, **15 cents.**

Describes and figures, life size, the majority of butterflies seen not only in the vicinity of New York City but in our eastern states generally.

- No. 39. How to Collect and Preserve Insects.** By F. E. LUTZ, Curator of Entomology. Sixth edition. September, 1927. 27 pages, 12 illustrations. Price, **10 cents.**

The purpose of this work is sufficiently explained by its title. It will be found very useful by those wishing to collect and study insects.

- No. 41. The Indians of Manhattan Island and Vicinity.** By ALANSON SKINNER. Fourth edition. July, 1926. 63 pages, 27 illustrations. Price, **20 cents.**

There is no subject which makes a more forceful appeal to the student, the historian or even the general reader than that of the native inhabitants of what is now Greater New York, yet there is no subject on which it is more difficult to obtain information. It is the object of this leaflet to briefly supply this information so far as it is available.

- No. 42. The Big Tree and Its Story.** By GEORGE H. SHERWOOD, Curator, Department of Public Education. Fifth edition. December, 1929. 31 pages, 9 illustrations. Price, **15 cents.**

Includes the labels by Ellsworth Huntington, telling how the relation of climate to history is recorded by the Big Trees.

- No. 45. A Brief Guide to Public Health Exhibits in The American Museum of Natural History.** By LAURENCE V. COLEMAN. Second edition. February, 1929. 15 pages. Price, **5 cents.**

Dealing with water supply, disposal of municipal wastes, and insect-borne diseases; an outline for teachers and students.

- No. 46. Peruvian Art. A Help for Students of Design.** By CHARLES W. MEAD. Fifth edition. December, 1929. 24 pages, 9 full-page plates. Price, **10 cents.**

Shows how the strange designs on the textiles and pottery of the ancient Peruvians are really representations of birds, of beasts, and of fishes that have gradually been transformed from pictures of animals to curious figures in which only the trained student can recognize the creatures depicted.

- No. 49. The Collection of Minerals.** By HERBERT P. WHITLOCK, C.E., Curator of Mineralogy. Third edition. June, 1926. 30 pages, 22 illustrations. Price, **15 cents.**

Describes in a general way the collection of minerals in Morgan Hall.

- No. 50. Indian Beadwork.** By CLARK WISSLER, Ph.D., Curator-in-Chief, Department of Anthropology. Second edition. May, 1927. 31 pages, 25 illustrations. Price, **20 cents.**

A description of the technique employed in bead and quill work, with a series of design motives from typical Plains Indian beadwork.

- No. 52. **The Hall of the Age of Man.** BY HENRY FAIRFIELD OSBORN. Fifth edition, revised and enlarged. October, 1929. 54 pages, numerous illustrations. Price, 30 cents.

Describes the exhibits illustrating what is known of the origin, relationships and early history of man as deduced from his remains and implements, also the paintings by Knight showing the animals by which man was surrounded in the early stages of his existence.

- No. 54. **Plants of Wax.** BY LAURENCE VAIL COLEMAN. Second edition, February, 1928. 16 pages, many illustrations. Price, 15 cents.

Tells how reproductions of flowers and foliage, such as are used in the various groups, are made.

- No. 55. **Basketry Designs of the Mission Indians.** BY A. L. KROEBER, Ph.D., Professor of Anthropology, University of California. 20 pages, 8 full-page plates. Second edition. November, 1926. Price, 15 cents.

Basket-making among the Mission Indians with special emphasis on an analysis of designs.

- No. 56. **The Geology of New York City and Vicinity.** BY CHESTER A. REEDS, Ph.D., Curator of Geology and Invertebrate Palæontology. Second edition, April, 1930. 36 pages, many illustrations. Price, 20 cents.

Gives a short résumé of the outstanding geologic features of the region. The age of the rocks, their distribution and the fossils found therein are also discussed.

- No. 59. **The Preparation of Rough Skeletons.** BY FREDERIC A. LUCAS. January, 1927. 15 pages, 11 illustrations. Price, 10 cents.

Skeletons are necessary not only for the student of the life of today, but for the palæontologist.

- No. 61. **The Capture and Preservation of Small Mammals for Study,** By H. E. ANTHONY, Curator, Department of Mammalogy. Second edition. September, 1927. 53 pages, 24 illustrations. Price, 15 cents.

An important manual for collectors and travelers interested in the small quadrupeds that are so little seen and are yet of great importance.

- No. 63. **Indian Costumes in the United States.** BY CLARK WISSLER, Curator-in-Chief, Department of Anthropology. July, 1926. 32 pages, 19 illustrations. Price, 15 cents.

Takes up geographical variations in American Indian costume—materials, patterns, and decoration.

- No. 64. **Meteorites, Meteors and Shooting Stars.** BY FREDERIC A. LUCAS. Second edition, 1930. 24 pages, 15 illustrations. Price, 15 cents.

A popular account of these visitors from the sky which have aroused the interest of beholders from the earliest times and have been variously regarded as messages from the gods, parts of comets, and fragments of a lost world.

- No. 65. **The Art of the Lapidary.** BY HERBERT P. WHITLOCK, C.E., Curator, Department of Mineralogy. 29 pages, 34 illustrations. December, 1926. Price, 15 cents.

Tells how diamonds and other precious stones are cut.

- No. 66. Seasonal Records of Geologic Time.** By CHESTER A. REEDS, Curator of Geology. 12 pages, 8 illustrations. Price, 10 cents.
The Big Trees of California record the climate of 3000 years past, but stratified clays, such as are found along the Hudson River, and in many other parts of the world, tell us of the climate of thousands of years before that.
- No. 68. Bird Hunting in Central Park.** By LUDLOW GRISCOM. December, 1926. 11 pages, 4 illustrations. Price, 5 cents.
Shows how much may be done by those who can not go far afield; contains a list of all birds seen in Central Park.
- No. 69. Distributional List of the Reptiles and Amphibians of the New York City Region.** By G. KINGSLEY NOBLE, Curator of Herpetology. Second edition. March, 1929. 9 pages. Price, 5 cents.
A preliminary statement of the general ranges of our local reptiles and amphibians.
- No. 70. The Hall of Dinosaurs.** By FREDERIC A. LUCAS. Second edition. December, 1928. 20 pages, 15 illustrations. Price, 10 cents.
A brief history of the Dinosaurs, with special reference to the Museum exhibit.
- No. 71. The Maoris and Their Arts.** By MARGARET MEAD, Assistant Curator of Ethnology. May, 1928. 38 pages, 23 illustrations. Price, 15 cents.
Covers work in greenstone, wood-work, weapons, textiles and tattooing, with special reference to decorative art.
- No. 72. A Drama of the Microscope.** By ROY WALDO MINER, Curator of Marine Life. October, 1928. 16 pages, many illustrations. Price, 10 cents.
Describes the new Rotifer group and contains a key to the numerous animals represented.
- No. 73. Pottery of the Southwestern Indians.** By PLINY EARLE GODDARD, Ph.D. December, 1928. 30 pages, 22 illustrations. Price, 15 cents.
Describes the methods of making the pottery as well as sequence of types.
- No. 74. Outposts of the Sea.** By ROY WALDO MINER, Curator of Marine Life. June, 1929. 14 pages, numerous illustrations. Price, 10 cents.
Describes the abundant animal life of the tidal zone—that strip of shore which is alternately submerged and laid bare by the daily rise and fall of the tides.
- No. 75. How Old is the Earth?** By CHESTER A. REEDS, Ph.D., Curator of Geology and Invertebrate Palæontology. May, 1931. 20 pages, one color plate and many illustrations. Price, 20 cents.
A clear presentation of how the earth reveals its age by the slow process of deposition and disintegration. A useful chart and clock of geological times are given.
- No. 76. Guide to the Hall of Biology of Mammals.** By ROBERT T. HATT, Ph.D., Assistant Curator of Mammals. November, 1933. 50 pages, numerous illustrations. Price, 30 cents.

A guide not only descriptive of the Hall but serving also as an introduction to the major groups of mammals and some of their points of biological interest.

- No. 77. Comets, Meteors, and Meteorites.** BY CHESTER A. REEDS, Ph.D., Curator of Geology and Invertebrate Palaeontology. June, 1933. 16 pages, 21 illustrations. Price, 10 cents.

Describes the origin, action and composition of these mysterious travelers of the sky.

- No. 78. Forty Tons of Coral.** BY ROY WALDO MINER, Ph.D., Curator of Living Invertebrates, July, 1933. 15 pages, 21 illustrations. Price, 10 cents.

The story of the preparation of the immense Coral Reef Exhibit now nearing completion in the new Hall of Ocean Life.

- No. 79. Jade, and the Antique Use of Gems.** BY HERBERT P. WHITLOCK, C.E., Curator of Minerals and Gems. December, 1933. 23 pages, 38 illustrations. Price, 15 cents.

A popular discourse on the appeal of color and rarity of certain minerals, to primitive as well as modern man, their use as charms, symbols, and for personal adornment, with a special chapter on the mythology, and symbolism expressed in the carvings of jade, "the jewel of heaven."

- No. 80. Diving in Coral Gardens.** BY ROY WALDO MINER, Ph.D., Curator of Living Invertebrates. 18 pages, numerous illustrations, colored frontispiece. November, 1933. Price, 10 cents.

An account of a scientist's work beneath the clear waters of the coral reefs of the Bahamas.

- No. 81. The World of Fishes, Recent and Fossil.** BY WILLIAM K. GREGORY AND FRANCESCA R. LAMONTE. Price, 25 cents.

- No. 82. Building the Museum Group.** BY A. E. BUTLER. Price, 15 cents.

General Guide to the Exhibition Halls. Nineteenth edition. 1934. 156 pages, many illustrations. Price, 35 cents.

Natural History, a bi-monthly magazine containing articles of general interest on natural history and travel, profusely illustrated. Subscription price \$3.00 annually; separate numbers, 50 cents.

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