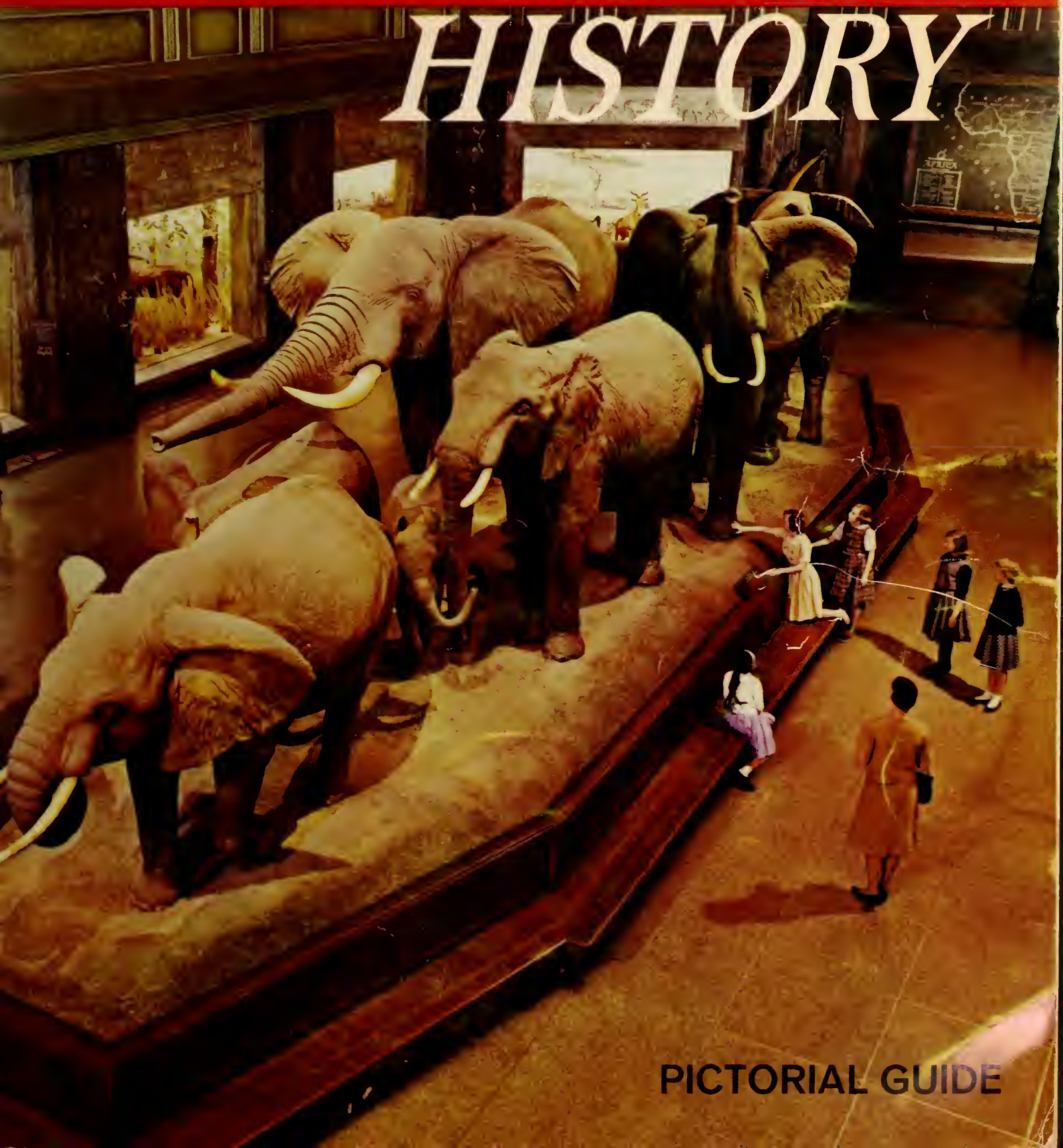
THE AMERICAN MUSEUM OF NATURAL HISTORY



PICTORIAL GUIDE

FRONT COVER: THE AKELEY MEMORIAL HALL OF AFRICAN MAMMALS

A PICTORIAL GUIDE TO THE MUSEUM'S EXHIBITS

WELCOME TO THE MUSEUM

Between 77th and 81st Streets in New York City, facing the western edge of Central Park, stands a group of eighteen interlocking buildings housing the 23 acres of exhibits, educational facilities, and research departments of The American Museum of Natural History. There are many other facts and figures that can be cited, but the Museum is more than statistics.

For the visitor, as he stands before the towering remains of *Tyrannosaurus rex,* it is a feeling of awe at the passage of time. Or it may be a new awareness of the subtlety of nature's timing, gained from watching four model fireflies rhythmically flashing their cold light. It is the six-pointed star gleaming in a gemstone, or the 9,000 stars visible several times a day on the dome of the Hayden Planetarium.

SOUTH FACADE OF THE MUSEUM, 77TH STREET, CENTRAL PARK WEST TO COLUMBUS AVENUE

For some, the Museum is the sound of a Winnebago war party; for others, the symmetry of the sea shell. For most, we hope, the Museum is a deepened sense of the variety and unity of the natural world.

James A. Oliver, Director

HAIDA CANOE

Visitors entering the 77th Street foyer of the Museum are greeted by an enormous ceremonial canoe some 64 feet long and 8 feet wide. This great dugout was hewed from a cedar tree by the Haida Indians of Canada's west coast.

In 1883, Haida braves paddled the ca-

noe to Vancouver Island. From there, it was taken by schooner to Panama, across the Isthmus by rail, and then by ship to New York.

Now, in the canoe, one can see an Indian chief, his followers, and slave paddlers dressed in costumes typical of the various tribes of the American Northwest. The busy activity of the scene is usually heightened by the noise and bustle of numerous Museum visitors—individuals, couples, and families, as well as school children lining up in the shadow of the great canoe for a tour of the Museum.


EDUCATION HALL
AUDITORI
10

NORTHWEST COAST INDIANS

Beyond the Haida canoe a great hall suggests a slightly damp forest-seashore environment, typical of the region extending from northern California to southern Alaska. It was here that the Haida, Tlingit, Tsimshian, Bella Coola, and other tribes lived.

These people looked primarily to the sea for food but supplemented their diet by hunting animals and gathering plants in the dense forests. From the forests, too, came materials for their houses and utensils. The fine wood sculptures and great totem poles lining this hall show clearly that these Indians also became master wood carvers.

The Hall of Indians of the Northwest Coast is arranged by tribal cultures. Most of the displays consist of artifacts made by the Indians, and include tools, fishing gear, baskets, clothing, textiles, and mu-

MODEL OF KWAKIUTL INDIAN HOUSE

CHILKAT BLANKET

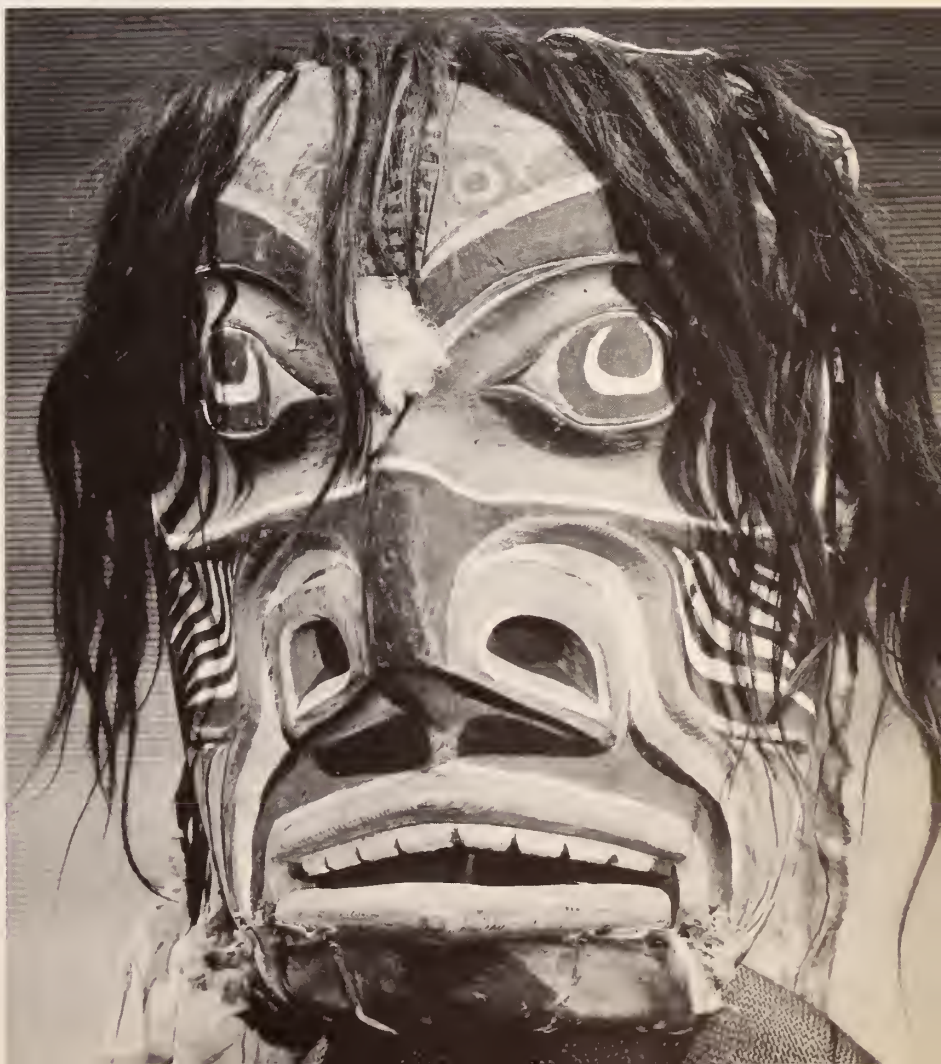
sical instruments. In addition, there are models, both miniature and life-size, showing the modes of life of different tribes.

Material for the hall was collected in the late nineteenth century (the hall was opened in 1896), at a time when the culture of these Indian tribes was still virtually unaffected by contact with the white man. As a result, Museum anthropologists succeeded in preserving all the important tangible aspects of a total culture.

Displayed along with the many artifacts of day-to-day life are objects associated with the rich ceremonial life of

these Indians. The striking masks, some of which are shown on this page, were worn as part of dance and ritual costumes. They are the result of great skill in carving combined with a vivid imagination. The masks represent monsters, ghosts, or spirits in human and animal form, carved in the characteristic style of each tribe.

The Hall of Indians of the Northwest Coast has been renovated periodically through the years, and new lighting has been installed, but the romantic mood of the original exhibit has been retained.



WESTERN ESKIMO DEITY MASK

ESKIMO MODES OF TRANSPORTATION

COPPER ESKIMO IN
CEREMONIAL CLOTHING

MODEL OF ESKIMO WINTER HOUSE

ESKIMOS

To live in the rigorous Arctic environment of snow and ice, the Eskimos had to develop special skills and cultural adaptations that have long been of particular interest to anthropologists. A basic requirement was ingenuity in fashioning tools and obtaining food from a severely limited range of raw materials.

One exhibit simulates houses made of snow; others show blubber-burning lamps, cooking implements, children's games, and many other artifacts of Eskimo culture in the nineteenth and early twentieth centuries. Since that time, repeated contact with technologically advanced society has greatly changed Eskimo ways.

SHELLS

Man has long prized shells for their beauty and usefulness. There are more than one million shells in the Museum's study collection, and a small but choice selection is featured in the Keller Memorial shell exhibit. Specimens of the major classes of mollusks are displayed, including lifelike models of an octopus, a squid, and a queen conch.

Of the 100,000 species of mollusks, most have shells ranging from a fraction of an inch to several inches in size. Some are microscopic, but others, for example the giant clams, attain 43 inches or even more. On exhibit are some of the smaller shells, including the delicate sea butterflies, and some of the largest, including the giant band shell, with a length of two feet.

MODERN HORSES

This small exhibit, temporarily housed in Education Hall, illustrates the great modifications that man has brought about 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 the Shetland Pony has been reduced to a diminutive size.

The similarity in structure of the skeletons of horse and man is brought out in the exhibit of a rearing horse, controlled by man. It is interesting to note that both have the same principal parts, in spite of the many conspicuous differences.

Also included in the exhibit are skeletons of several famous race horses, as well as animals akin to the horse, such as the donkey and Grévy zebra.

CHAMBERED NAUTILUS

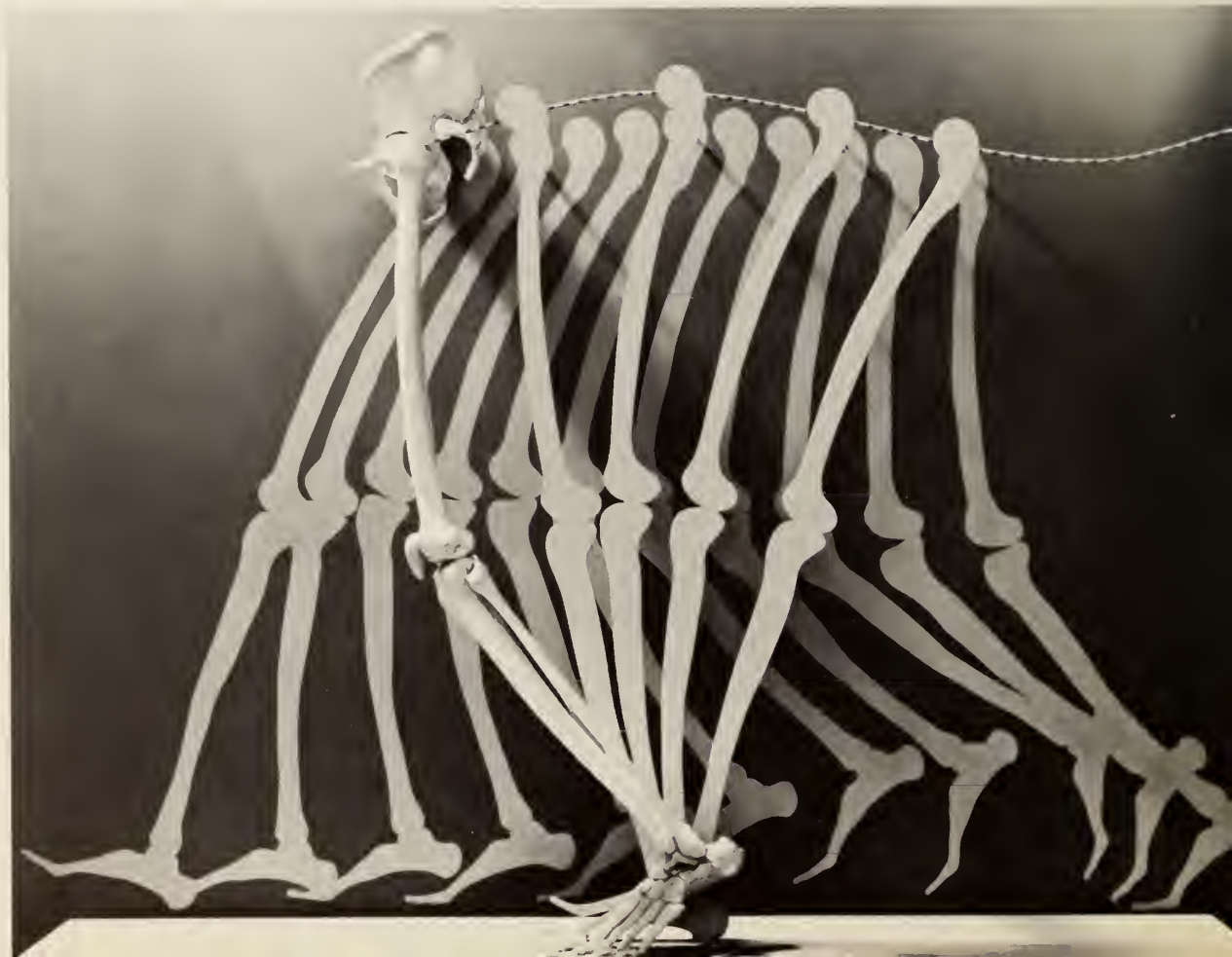
RECONSTRUCTIONS OF EARLY MAN

THE BIOLOGY OF MAN

For many people, man is the most interesting subject of all. This hall, one of the most comprehensive exhibitions of its kind, focuses on the biological aspects of man.

On entering the hall one is first confronted by a series of sculptured reconstructions of 15 prehistoric beings. These, plus other exhibits in the first section of the hall, illustrate the structural changes that took place in the

WALKING MOTION OF THE HUMAN LEG



forerunners of modern man. Here, on a 21 by 14 foot ceramic mural, is a huge spiral that represents the two billion years that life is known to have existed on earth: on this time scale, man's time on the planet appears as a small, red square.

A greatly enlarged, illustrated plastic model of the basic unit of life, the cell, showing the internal structure in detail, introduces the second section of the hall. Models of specialized cells from different parts of the body — nerves, bones, skin, muscles, and connective tissue — demonstrate the ways in which cells are adapted to different functions; illustrations of the processes of meiosis and mitosis show how cells divide.

One striking attraction of the hall is a transparent plastic model of the human body. Various organs and systems are illuminated in succession as a taped voice describes their functions.

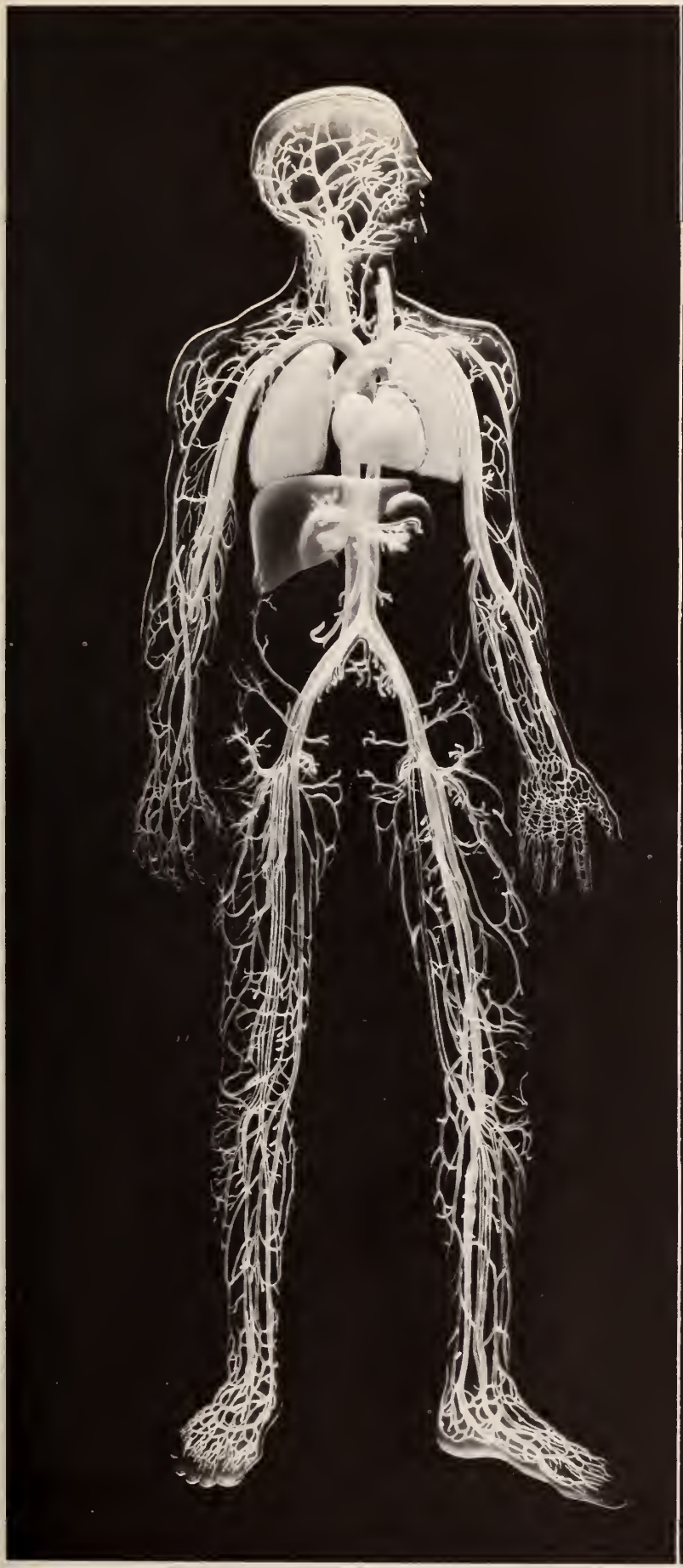
The elements involved in the most

THE TRANSPARENT WOMAN

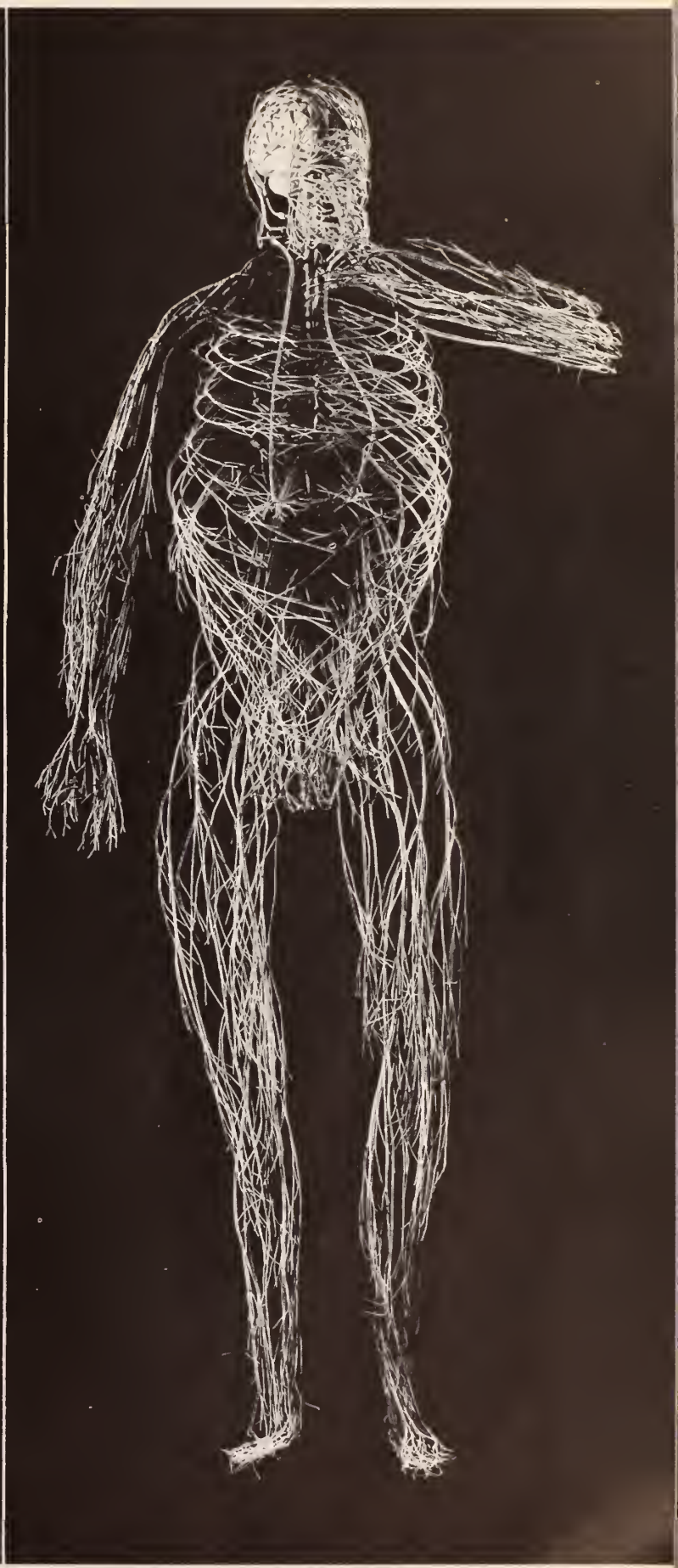
Successive exhibits show how we grow; how we breathe; how our circulatory, nervous, and digestive systems work; how we move; how our bodies eliminate waste; the functions of the endocrine glands; and our sensory organs. For example, a model of the circulatory system, made of transparent plastic with etched arteries and veins, simulates by means of edge lighting the dynamics of blood circulation. In another model, nearly a mile of wire is used to trace the human nervous system.

basic of all natural processes, reproduction, occupy the next stage of the exhibition. Photographs enlarged 8,000 times show a human egg surrounded by sperm. There are fetal specimens, ranging in age from nine weeks to seven months, preserved in plastic. A series of ingeniously colored plaster models shows the changes in facial structure that occur as the fetus develops. A series of six other sculptures sensitively depicts the crucial moments during the delivery of an infant into the world.

BIRTH OF A BABY



THE HUMAN CIRCULATION SYSTEM



THE HUMAN NERVOUS SYSTEM

AN OCTOBER AFTERNOON NEAR STISSING MOUNTAIN

DETAIL OF LIFE IN
THE SOIL, SPRINGTIME

MAN AND NATURE

A good deal of natural history can be learned in one's own back yard, as this hall demonstrates by focusing on a rural area in Dutchess County, New York. The area, some 90 miles north of New York City, was chosen for its variety of landscape and life. The hall interprets the ecology of an area—that is, the relation of individual organisms and groups of organisms to their total environment of living and non-living things.

Exhibits show the geologic history of Dutchess County, its fossil life, and the effects of glaciation. The impact of man on the land in clearing it for living space, farms, and orchards can also be seen. Implicit in all the exhibits are the ceaseless and interlocking patterns in the ever changing web of nature: water cycles, nutrition, decay, and the many relationships among soils, plants, and animals.

OLYMPIC FOREST SCENE

ABOVE: SECTION OF GIANT SEQUOIA LOG

ENLARGED MODEL OF ANT ON ACORN

NORTH AMERICAN FORESTS

A forest is more than an assemblage of trees; it is a complete plant, animal, and rock community. This is the theme of the Hall of North American Forests.

Most spectacular of the exhibits is a 4-foot-thick cross section of a giant sequoia log measuring 16½ feet in diameter and, even after years of drying out, weighing nine tons. Because of its great size, the log had to be cut into 12 pieces when it was brought to the Museum. The tree from which the log was taken was felled in 1891 when it was 1,341 years old.

Other exhibits focus on specific aspects of forest communities such as soil and soil life; wildflowers and other small vegetation characteristic of different types of forests; forest animals and the "food chains" that link them to one another and to the plant community; the constructive and destructive ways in which man uses forests; and the ways in which forest communities change and reproduce themselves.

At the core of the exhibition are 11 habitat groups re-creating forest communities as they exist at various sites throughout North America.

Visitors frequently ask what parts of the habitat groups are real, what parts simulated. Many of the accessories are real. Soil, for instance, and small rocks are often brought from the actual site. Small trees, stumps, and branches are real, and are displayed just as they are found in the field. So, too, is some of the ground cover, such as certain grasses, lichens, mosses, and small evergreens. Vegetation of this type lends itself to preservation, although painting is required to restore its natural color.

In general, everything that can possibly be preserved is used, but many of the smaller objects, including leaves, bushes, and flowers, are artificial. A variety of materials are used in simulating these features. Large trees are made by transferring bark to a frame of plaster and wire, or by assembling bark-covered slabs cut from the outer layers of trees. Leaves present a special problem be-

cause of their numbers. They may be made of paper, wax, or plastic. Each artificial leaf, however large the bush or tree, must be individually trimmed, shaped, and colored. Petioles, stems, wormholes, and other details must be added by hand.

One of the most beautiful exhibits, the Olympic rain forest, has some 300,000 leaves. Those who look carefully at the exhibit will discover that overhead mirrors have been used to give the illusion of great height.

The giant cactus forest group of Arizona illustrates another technique of exhibition. To make the light appear to come from the background of the exhibit, false shadows are meticulously painted across the terrain. Crosslighting is used to obliterate the true shadows coming from light above the exhibits.

DETAIL OF NORTHERN SPRUCE FIR FOREST

JEFFREY PINE FOREST

DETAIL OF THE PINON JUNIPER FOREST

EFT: GIANT CACTUS FOREST

Some of the most exciting work in science today is being done in the study of molecular biology, a discipline in which physicists, chemists, and biologists pool their skills to probe the mysteries of the living cell. One of the exhibits in this hall presents the most recent concept of how life may have originated at least two billion years ago and how it maintains itself on the cellular level.

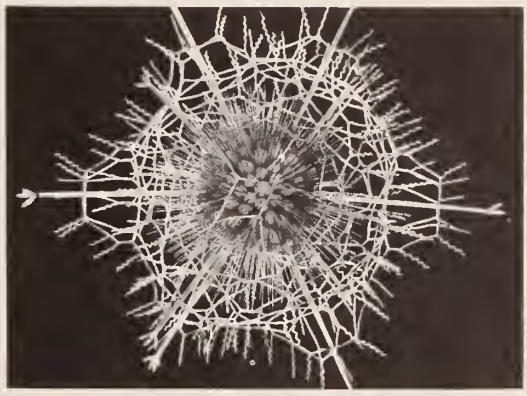
Two continuously projected films are part of the exhibition. One shows the process by which lifeless chemicals may have combined and formed the precursors of living cells The other shows how living cells—and thus all living organisms—are governed by the chemical compounds DNA and RNA. One highlight of the exhibition is a plexiglass model of an idealized cell, enlarged 40,000 times.

The invertebrates comprise about 90 per cent of all animal species, and perhaps the most abundant of all of these, the single-celled Protozoa, are displayed

GLASS MODEL OF *GLOBIGERINA BULLOIDES*

here by enlarged hand-blown glass models, created over a period of 40 years by Herman O. Mueller and now mounted in clear plastic panels as if suspended in water.

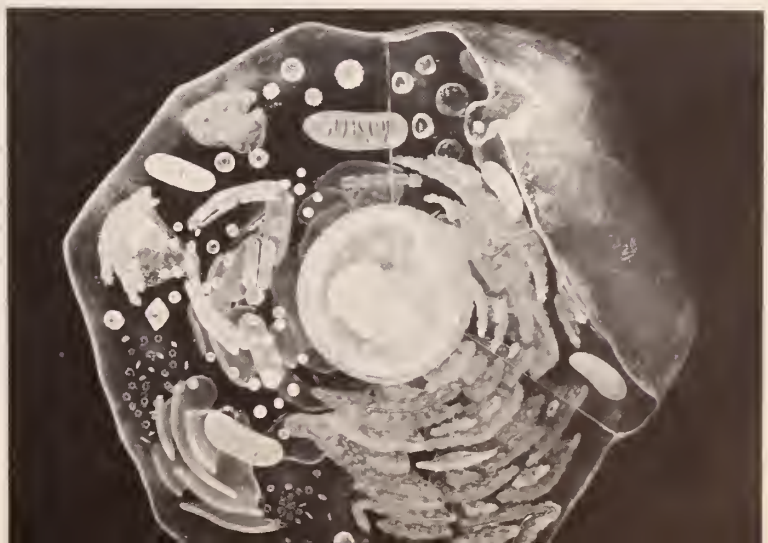
Nearby, under four enlarged fireflies flashing against a night sky, the visitor can observe the greenish light of translucent jellyfishes, the bluish-white light from a colony of hydroids, the glow of Antarctic krill, and the "headlights" on a South American click beetle. These and other examples of bioluminescence are illustrated in seven dioramas mounted in large cylindrical tanks. Daylight alternates with night through the use of a changing cycle of incandescent and ultraviolet light.



GLASS MODEL OF *LYCHNOSPHAERA REGINA*

Other alcoves are open in this yet-to-be-completed hall. One is devoted to the life history and economics of those well-known culinary delights—shrimps, lobsters, and crabs. A second graphically illustrates the process of evolution. An interesting example shown is that of the oak moth in New York City, which changed from the light, flecked insect it was 100 years ago to one that is almost coal-black today, in response to the darkening of tree trunks brought on by New York's air pollution. Another alcove is devoted to the behavior of invertebrates, including the still mysterious ability of some creatures to tell time through what seems a precise biological clock.

ENLARGED MODEL OF A CELL



MOUNTAIN LION

NORTH AMERICAN MAMMALS

The great Alaska brown bear, largest land-dwelling carnivore in North America, is the first of 90 mounted animals the visitor sees as he approaches the Hall of North American Mammals. Full-grown males, such as the one pictured here, can weigh as much as 1,200 pounds and stand seven feet tall.

The photograph at the right shows part of another display in this hall—a dramatic reconstruction of a fight between two Alaska moose, largest member of the deer family found on this continent. The antlers of the bull to the right have a spread of $77\frac{5}{8}$ inches, the world's record when the animal was killed.

The 29 exhibits in this hall and scores of others in the Museum are called "habitat groups" because they display the

animals in their natural environment, behaving naturally—fighting, resting, stalking prey. Each habitat group is the result of an expedition to a different part of North America. The geographic location and a particular time of year and day are represented in each scene.

Some of the exhibits focus on a narrow range of activity while others show panoramic views. A beaver family is at work on the bank of Hoister Creek in Michigan's Gladwin State Game Refuge in one display. In nearby exhibits, a herd of bison roam a vast western plain and mountain lions pause at the rim of the Grand Canyon. Geographic sites range from Ellesmere Land, 700 miles south of

ALASKA BROWN BEARS

ALASKA MOOSE

JAGUARS

the North Pole, to Florida and from the Gaspé Peninsula to the Alaska Peninsula.

The creation of the backgrounds begins in the field, where an artist photographs and sketches the site to be reproduced. At the Museum, a small model is made of the habitat group, and the positions of the foreground objects are changed until the desired effect is achieved. Only then does the artist paint the background of the full-scale group. Paintings are merged with three-dimensional objects in the foreground to produce the realistic effects shown here.

WAPITI

RIGHT: GRIZZLY BEAR

SMALL NORTH AMERICAN MAMMALS

Adjoining the Hall of North American Mammals is a corridor where sixteen small mammals of this continent are on display. Each animal is presented in a close-up view so that visitors can spot even the very small ones—the ermine and the red-backed vole—in the realistic vegetation.

Some of the animals in the exhibit are common, such as the otter and the badger, but others are extremely rare. The black-footed ferret, shown investigating a prairie dog hole near Wind Cave National Park in South Dakota, has almost disappeared. The seldom seen Kaibab squirrel scampers along a tree branch on the northern rim of the Grand Canyon after a heavy October snowfall.

Other animals in the exhibit are the mink, the marten, and the muskrat—all of which are valuable for their fur—the northern flying squirrel, the kit fox, the kangaroo rat, the peccary, and the armadillo. They are shown in habitats representing thirteen states, provinces, or districts ranging from the Mackenzie District of northern Canada, where the wolverine is shown prowling for food, to the Santa Ana National Wildlife Refuge in Texas, the setting for the armadillo. In a scene near Steuben County, New York, a woodchuck sits by the side of the road.

The plant life that surrounds the animals is as interesting as the creatures themselves. The badger browses through sagebrush and mule's ear, while the otter is seen among such vegetation as Labrador tea, the pink-flowered fireweed, and the red fruits of the bunchberry and mountain holly. In other exhibits, the sparse vegetation at the edge of the Canadian tundra contrasts with a forest floor where the many varieties of plant life are shown in perfect detail.

MARTEN

KAIBAB SQUIRREL

ABOVE: PECCARIES BELOW: WOLVERINE

MARSH BIRDS AT EVENING

GARDEN WARBLER FEEDING EUROPEAN CUCKOO

THE BIOLOGY OF BIRDS

A spectacular flight of birds winging across a Bahamian sunset; a cast of the fossil of the oldest-known bird, the *Archaeopteryx;* an eight-foot "apartment house" community nest of African social weavers—these and many other striking exhibits await visitors to the Sanford Memorial Hall of the Biology of Birds, a hall named in honor of Dr. Leonard C. Sanford, student and patron of ornithology.

Included in the exhibition are hundreds of specimens of birds, bird skeletons, models, maps, anatomical displays, diagrams, and photographs.

The first part of the hall includes representatives of all major bird families. There is a glittering display of hummingbirds, those smallest of all birds, and in another exhibit the skeleton of a hummingbird is seen beside the fossil leg bone of an elephant bird, the largest bird ever to have existed. Among extinct birds represented are the lovely passenger pigeon and the clumsy dodo, the latter by a skeleton as well as a reconstruction.

The second section of the hall is a

THE HATCHING OF A DUCK CHICK

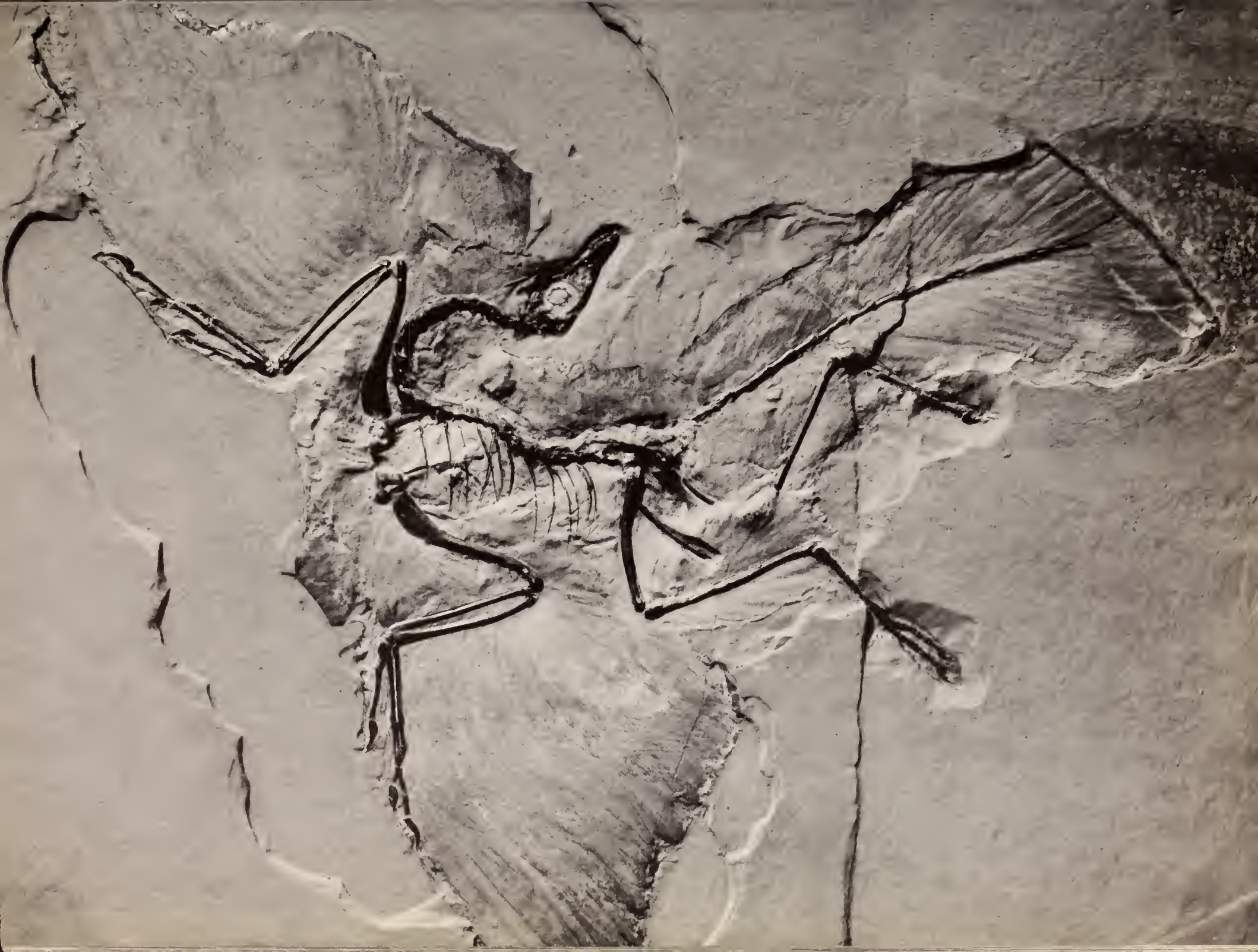
ABOVE: SAMOAN FRUIT DOVE

three-dimensional encyclopedia of the biology and behavior of birds. Basic anatomy and physiology are illustrated by various models. Exhibits of the structure and color of feathers and of the dynamics of bird flight are especially interesting. Still other exhibits show courtship displays, nesting, reproduction, incubation, and care of the young. The basic principles of evolution are traced as they are manifested in the adaptations of birds to particular environments. One beautiful exhibit illustrates how different birds find their food in a variety of situations on land and water.

Several exhibits show the distribution and dispersal of birds; others show what is known of the whys and hows of bird migration. In one alcove the relationship of birds to man is presented—their appearance in art and mythology as well as their use for food, adornment, and as objects of the hunt.

EARED GREBE

RIGHT: CAST OF FOSSIL *ARCHAEOPTER*



THE PLANETARIUM

Neither time nor space is limited in the American Museum-Hayden Planetarium. Here, in its corridors and beneath its star-studded dome, the universe is brought within sight of all.

The scope presented is limitless, ranging as it does from prehistoric men searching for patterns in the stars to modern men and their rockets crossing new frontiers of space. Astronomical displays and exhibits tell the story of man's attempts to observe the universe and illustrate much of what he has learned.

Each year more than half a million visitors take their seats under the great dome, and wait as music rises and myriad stars appear. What makes this spectacle possible is the two-and-a-half-ton Zeiss projector, one of six in this country. This instrument can reproduce the visible features of the sky, including about 9,000 stars, as they will appear tonight or tomorrow night—or as they appeared thousands of years ago over a cave dweller's campfire. Unlike most planetarium projectors, this one distinguishes star brightness down to one-tenth magni-

ASTRONOMY AND THE INDUSTRIAL REVOLUTION

A VIEW OF THE SOLAR SYSTEM

tude, which accounts for the extremely realistic effect achieved.

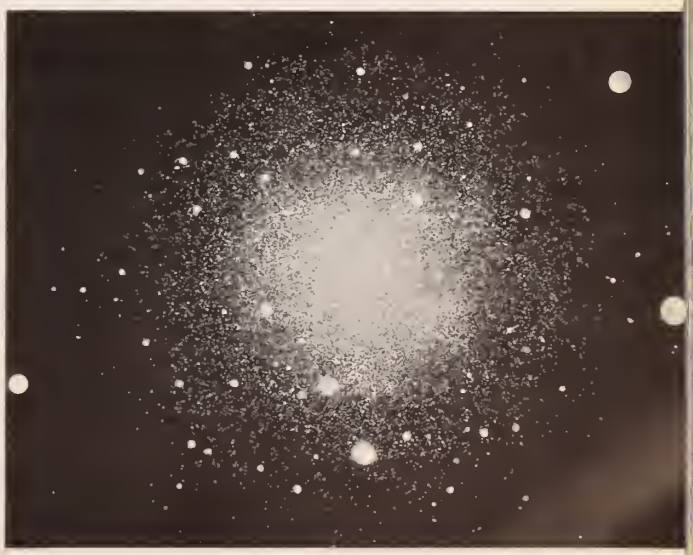
A unique system of projectors, situated around the base of the Planetarium dome, makes it possible to simulate such special effects as eclipses, clouds, rainbows, comets, the auroras, and a variety of breath-taking horizons.

The popular shows presented in the Sky Theater are only one of the many services the Planetarium provides. Others include courses in astronomy and navigation for the public, workshops and institutes for teachers, college lecture programs, and summer and after-school programs for youngsters.

LUNAR LANDSCAPE

WILLAMETTE METEORITE

STAR CLUSTER



BIRDS OF THE WORLD

The 12 habitat groups comprising this hall offer a striking lesson in the diversity of bird life in various parts of the world, from the pampas and lagoons of South America to the Canadian tundra, from the plains of Africa to an English forest.

In addition to the birds, each exhibit shows the vegetation and terrain of a given habitat. The Canadian tundra group is typical of the way the panoramas reveal the relationship between a mixed population of birds and their environment. Set on the western side of Hudson Bay, it shows the region where the forests to the south give way to the treeless tundra that stretches northward to the Arctic Ocean. The season is summer, when the region is dotted with innumerable insect-filled ponds. Here thousands of migrating birds come to nest—sand-

PTARMIGAN AND YOUNG

CURASSOW

EFT: JAPANESE BIRDS

pipers, plovers, gulls, ducks, and geese. Among them is the willow ptarmigan, an Arctic grouse. It is one of the few birds that winters in the Arctic, and its legs and toes, as well as its body, are densely feathered to withstand the cold.

Some of the habitat groups in this hall were built in the early 1920's, but many of the basic exhibit techniques pioneered by the Museum were already in use at that time. The character of the ground, for instance, is simulated by contoured wire netting, burlap, and plaster. Earth, vegetation, rocks, and wildlife are placed over this foundation so that a remarkably realistic effect is achieved, even within the walls of a New York City building. The "life expectancy" of such exhibits is 25 to 30 years, after which some renovation may be necessary.

CONDOR

BIRDS OF THE ARGENTINA
PAMPAS AND LAGOONS

TUNDRA BIRDS OF THE HUDSON BAY REGION

MEN OF THE MONTAÑA

Just to the east of the Andes lies an area known as the Montaña, a dense tropical rain forest that is the home of some 30 Indian tribes. Although they lived near the Incas in the Peruvian highlands, the tribes of the Montaña were little influenced by them. Instead, Montaña culture became much more closely linked to that of other Amazonian Indians.

The Indians of the Montaña subsist principally by gardening, fishing, and hunting. The tribes that live along the Ucayali and other large rivers depend greatly on fish, manatees, and turtles to supplement their diet of manioc and maize. Those living away from the main rivers rely more on hunting than on fishing.

The tribes of the Montaña make extensive use of raw materials offered by the forest in making tools, weapons, utensils, and ornaments. The skill and care with which these artifacts are fashioned can be appreciated by examining the specimens on display.

Although there is a general similarity among all Montaña cultures, differences do exist—in house types, settlement patterns, social organization, and religious beliefs. A unique trait of the Jivaro, for example, and one for which they are widely known, is their practice of shrinking the heads of their slain enemies. Several of these are on display.

TYPICAL FACE ADORNMENT

CAMPA FISHERMAN

WEAVING SCENE

SIBERIAN TIGERS

ASIATIC LEOPARD

INDIAN ELEPHANT

ASIATIC MAMMALS

The visitor interested in comparing the animal life of one area of the world with another will find his task easy and interesting as he walks from the Akeley Hall of African Mammals to the nearby Hall of South Asiatic Mammals.

In the Asiatic Hall, the Indian elephant, which occupies a central position, is smaller than his African counterpart and has smaller ears. The Asian lion looks much like its African cousin but is slightly smaller and paler in color. The mane of the male does not seem as heavy and dark as that of the African male. Comparisons can also be made between the various species of antelope, gazelle, wild dog, leopard, and buffalo that inhabit the two areas. The wild cattle and deer of the Asiatic Hall have counterparts in the Hall of North American Mammals.

One of the most beautiful displays in the Hall of South Asiatic Mammals is the Indian leopard. In a forest clearing, a leopard pauses in its meal, with the gorgeous feathers of a peafowl scattered around it, while another leopard looks on. The forest vegetation includes the Semal tree, from which silk cotton is made; the cinnamon tree, and the weird banyan tree, which strangles the tree that supports it.

The mammals displayed in the hall were collected by Arthur S. Vernay and Colonel J. C. Faunthorpe in six expeditions to India, Burma, and Siam between 1922 and 1928.

Adjacent to the Hall of South Asiatic Mammals are two habitat groups from northern Asia. The rare giant panda is shown feeding on bamboo in the mountains of western China and the Siberian tiger is displayed in a snow-covered forest.

GIANT PAND

THEODORE ROOSEVELT M

The four-story Theodore Roosevelt Memorial, facing Central Park West, was a gift of the people of the State of New York. Dedicated in 1936, it honors the native son who was Governor of the State at the turn of the century and later President of the United States.

An equestrian statue of Roosevelt stands before the arched entrance, which opens into a monumental hall, one of the largest unobstructed concourses remaining in New York City. Above the terrazzo floor, walls of marble and limestone rise to support a 120-foot-long barrel vault that arches to a height of 100 feet. Light streams through large windows at either end of the vault.

Recessed murals on the north, west, and south walls depict three events in T. R.'s varied career; his expedition to Africa in 1910; the digging of the Panama Canal; and the signing of the Treaty of Portsmouth. The murals, painted by William Andrew Mackay, cover an area of 5,230 square feet. In the center of the hall three bronze sculptures by Carl Akeley comprise "The Lion Hunt."

On the first floor of the Memorial, directly below the main hall, are exhibits related to the life and interests of the twenty-sixth President. Habitat groups

show scenes of New Amsterdam, the home of his earliest American ancestor; Elkhorn Ranch in North Dakota, where he lived as a young man; the Adirondacks, one of his favorite camping grounds; and the Roosevelt Bird Sanctuary in Oyster Bay, established after his death.

Display cases in the center of the lower hall contain memorabilia of Roosevelt's many roles in life: conservationist, naturalist, hunter, rancher, writer, family man, and public servant. The collection includes photographs, sketches, and notebooks; original political cartoons of T. R. and newspapers of the period; a "Teddy and the Bear" bank; and a buckskin suit worn by Roosevelt.

In other exhibits on the first floor of the Memorial, the natural history of New York State is represented by collections of birds, mammals, amphibians, reptiles, and geologic specimens.

Several quotations from Roosevelt's writings are inscribed on the interior walls of the Memorial. One that expresses a lifelong concern of his also describes a major aim of the Museum: "The nation behaves well if it treats the natural resources as assets which it must turn over to the next generation increased and not impaired in value."

BLACK RHINOCEROS

COLOBUS MONKEYS

AFRICAN MAMMALS

This hall is dominated by the herd of eight great elephants, shown on the front cover of this book. Here one also finds many of the other distinctive creatures—the lions, giraffes, gorillas, and zebras—that one learned about in childhood.

The animals in each exhibit are arranged in natural groupings of family units or herds and in association with birds and other animals that are part of their environment. Such is the skill with which the reconstructed terrain, vegetation, and animal life are combined with painted backgrounds of land and sky that it is difficult to see where the three-dimensional parts end.

Usually it is only after repeated visits to the Museum that one begins to notice some of the finer details of these exhibits —the veins of the giant eland's muzzle, for example, or the spittle of the African buffalo. Birds in many of the exhibits are so much a part of the scene that visitors sometimes fail to notice them. That is a pity, for some of these birds, native to Africa, are not to be found in any of the bird halls.

If only one person were to be given credit for the lifelike animals in these exhibits it would be Carl Akeley (1864-1926), conservationist, sculptor, inventor, and taxidermist, who devoted the greater

part of his life to the protection of wildlife. Although he designed the hall now named in his honor, he died 10 years before it opened in 1936.

A major concern of Akeley, the survival of the gorilla, is still very much the concern of naturalists. One of the most memorable exhibits in this hall shows a group of mountain gorillas with the Kivu volcanoes of the Congo in the background. Akeley died near there while on a Museum expedition and was buried on the slopes of Mount Mikeno, one of the volcanoes shown. He called this part of Africa "the most beautiful place in the world."

The gorillas, like almost all the large animals in the museum's habitat groups, were mounted by a process Akeley himself developed. Before his time, animals exhibited in Museums consisted of little more than skins given bulk and form by excelsior. Akeley pioneered a new approach that led to the "manikin" models.

The process begins in the field when measurements are taken of an animal that has just been killed. (Quite often photographs of it have already been taken when it was alive.) Next, the skeleton and skin, along with such parts as hoofs, claws, tusks, or horns, are sent to the Museum. The skeleton is arranged

BONGOS

RIGHT: MALE GORILL

in the desired pose, and a clay figure of the animal, including such details as muscle forms, is modeled over it. When the clay figure fits the skin perfectly, a plaster mold is made over the clay model. When the mold is removed, an inner shell is built up with layers of wire mesh, burlap, and glue. The whole is then reinforced with wood braces.

This hollow but durable structure, about half an inch thick, becomes a manikin. The skin, which in the meantime has been treated, is then pulled over the adhesive-coated shell and sewed together. The face and other fleshy parts of the animal are modeled in wax, then painted. Glass eyes are added and original parts such as hoofs and horns are attached. The results of this painstaking method are the lifelike animal models seen in this hall and its gallery, as well as in other parts of the Museum.

AFRICAN BUFFALOES

AFRICAN LIONS

EFT: GIRAFFES AND GAZELLES AT A WATER HOLE

IMPALA

:FT: DETAIL OF LIFE ALONG THE RIVER NILE

OCEANIC BIRDS

Imagine yourself in the middle of the Pacific Ocean, able to see its various islands and coasts thousands of miles away. This is the illusion the Hall of Oceanic Birds is designed to create, and the effect has been heightened by linking all the habitat groups with a common horizon line.

Rising from the painted backgrounds of the 22 exhibits, the sky converges on the dome, forming the ceiling of the hall. Suspended from the ceiling are some of the oceanic birds that wing their way across the sea from the Pacific to the Antarctic.

The exhibits represent many unfamiliar landscapes and locales. There are the Peruvian coastal islands from which, since Inca times, guano has been taken for use as fertilizer. One exhibit features the now-extinct moa, a great wingless bird, together with other species still found in New Zealand today.

The Galápagos Archipelago exhibit contains some of the species of finches that Charles Darwin saw in 1835. Darwin noticed that the bill structure of the islands' finches varied noticeably according to the birds' feeding habits. He decided that all finches had evolved from one species that originally inhabited the islands. It was this observation that encouraged Darwin to think of natural selection as an explanation of evolution.

BELOW: EMPEROR WILLIAM'S BIRD-OF-PARADISE

RIGHT: MOA

LAYSAN ALBATROSS

The Hall of Oceanic Birds is named in honor of William C. Whitney and Harry Payne Whitney, father and son, for it was the Whitney family who sponsored this wing of the Museum. They also sponsored the expedition that collected many of the specimens in the exhibits. The schooner of the expedition, the *France,* can be seen in the background of the display that shows birds accompanying a vessel off the coast of New Zealand.

Several of the displays offer graphic examples of one of the special challenges of creating habitat groups. To use actual boulders and cliff faces in the Bering Sea group, for example, would have put too great a burden on the structure of the building. Therefore, although the smaller rocks are real, all large rock formations are artificial. Despite their authentic appearance, they are made of wood, wire mesh, burlap, plaster, and papier mâché, dyed and painted to include even such details as lichen growth and dampness.

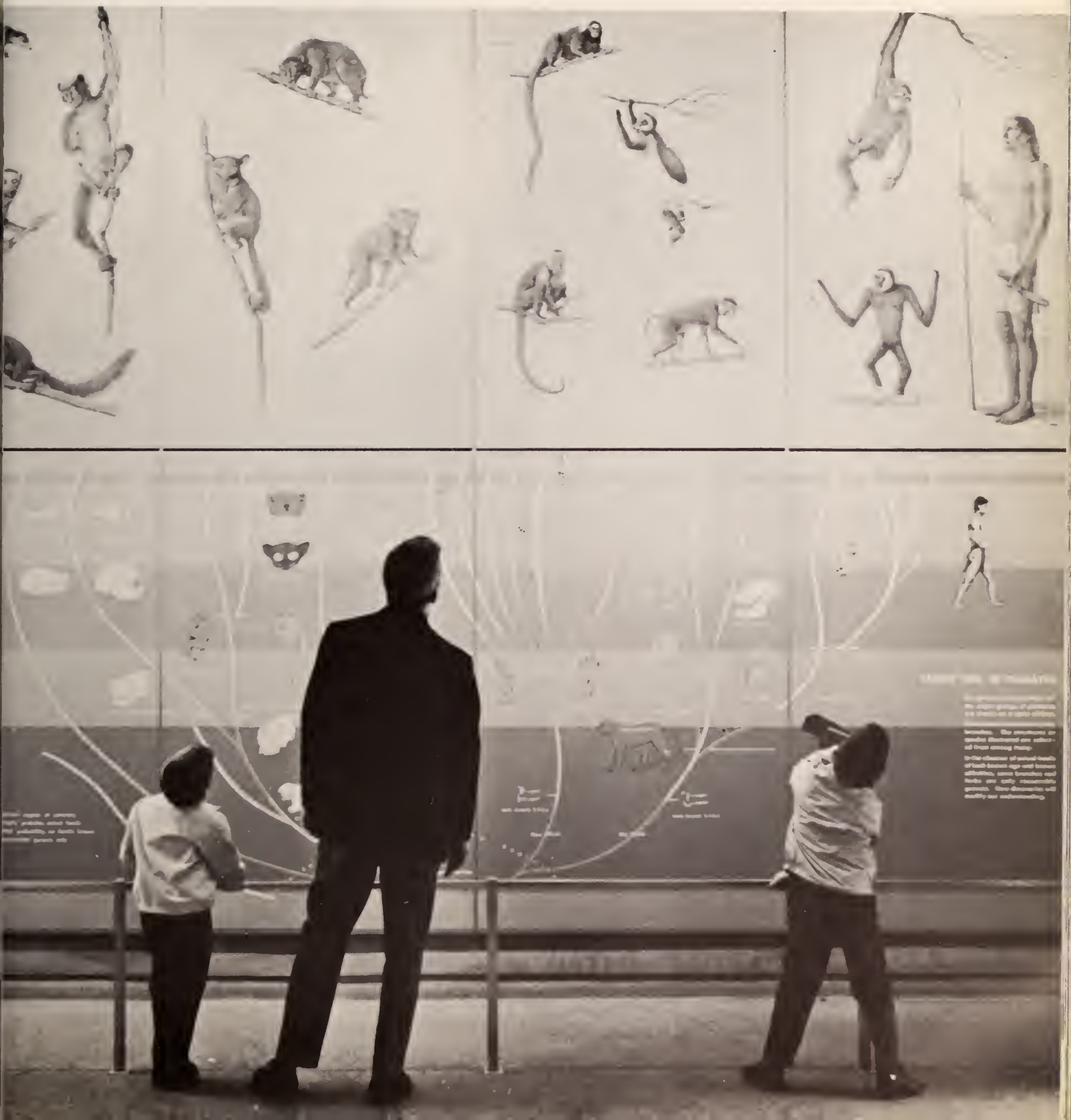
ARCTIC SEABIRD LIFE

PRIMATES

Man is a primate—and that fact alone goes a long way toward explaining the popularity of this recently opened hall. Displayed here are the other major primates, including the apes and the New World and Old World monkeys, as well as some lesser-known members of the order such as the lorises, the potto, the aye-aye, a tarsier, and several lemurs.

Of particular interest is the exhibit showing some of the characteristics that distinguish primates from other mammals—for example, the grasping fingers of the hand with the apposable thumb. The first primates arose from a group of insect-eating mammals about 70 million years ago and continued to diverge from these primate-like insectivores by specializing in various ways. Many of the adaptations that eventually led to the development of the species *Homo sapiens* can be seen in the exhibits comprising this hall.

THE FAMLY TREE OF PRIMATES



INDIANS OF THE EASTERN WOODLANDS

SEMINOLE COSTUMES

IROQUOIS COSTUME

YUCHI WOMEN TANNING SKINS

It would be hard to find someone who did not know that the Indians made canoes out of birch bark. But it was also hard to find someone who knew exactly how they did it. This process is exhibited in one of the Museum's newest halls devoted to the Indian tribes who inhabited the woodlands from Florida to the subarctic regions of Canada.

Here, on brightly colored panels and murals, in models, and miniature dioramas, one can see costumes and artifacts from the Museum's vast anthropological collections, artfully arranged to show how these Indians lived before the arrival of Europeans. One of the most alluring features of this hall is that one walks through it to a musical accompaniment: songs for a Winnebago war party, an Ojibwa song for the maple-sugar collecting season, and a chant for the "moccasin game" are all an integral part of the exhibition.

INSIDE A BLACKFOOT TIPI

INDIANS OF THE PLAINS

Think of American Indians and the image that comes to mind is the colorful buffalo hunter and warrior of the Plains. The finest artifacts from the Museum's vast Plains Indian collection have been used to illustrate the culture of the 25 Indian tribes that roamed the Plains between the Mississippi River and the Rocky Mountains and from Canada to Texas. All exhibits are accompanied by models or paintings depicting Indians hunting, farming, playing, or engaging in one or another of their elaborate ceremonies. Indian songs associated with various activities play from loudspeakers near the appropriate exhibits.

A highlight of the hall is a habitat group showing a life-sized interior of a Blackfoot tipi. Six costumed figures are engaged in the Thunder Pipe ceremony. The scene gives an authentic glimpse of what life must have been like in the middle nineteenth century among the Blackfoot, a typical Plains Indian tribe.

OFFICER OF THE ARAPAHO DRUM SOCIETY

HIDATSA EARTHLODGE

OFFICER OF ARAPAHO DOG SOCIETY AND DANCER OF ARAPAHO CRAZY SOCIETY

DAKOTA CEREMONIAL DRESS

ABOVE: AMERICAN EGRET

ABOVE: MARSH DUCKS IN SPRING

PEREGRINE FALCONS

NORTH AMERICAN BIRDS

The Frank M. Chapman Memorial Hall of North American Birds offers a tour of our continent and its diversity of bird life: a peregrine falcon is shown nesting on a rocky ledge of the New Jersey Palisades, just across the Hudson River from New York City; Brandt's cormorant is shown in its home near Monterey, California, on the other side of the continent.

An Arizona desert group includes such birds as the cactus wren, the roadrunner, the curve-billed thrasher, and Gambel's quail. There is also a night scene along the Potomac, where a great horned owl is shown returning to its mate with a muskrat in its claws. Wood warblers throng a dogwood branch, and a colony of anhingas, or snakebirds, nest in the Florida Everglades.

A visitor to the Hall of North American Birds will notice that several plaques are written in the past tense: the New Jersey marshes *were* visited by vast numbers of migrating swallows, bobolinks, and other birds, but pollution and construction have driven most of them away.

Several of the birds shown in these exhibits are extinct. The Carolina parakeet, only member of its family to nest in the United States, became extinct around 1900 and the Labrador duck disappeared around 1871. Only 50 skins of

GREATER SNOW GEESE

NORTH AMERICAN BALD EAGLES

the Labrador duck were preserved and the Museum's exhibit of this bird is the only one in existence.

Other birds on display are seriously threatened. The California condor, which weighs about 20 pounds and has a wingspread of almost 10 feet, is among the world's largest flying birds. Only about 40 condors remain today. The whooping crane, of which less than 50 survive, is shown here in a former nesting place in Minnesota. The United States' national emblem, the bald eagle, has so decreased in numbers that its survival is seriously threatened in many areas.

The Hall of North American Birds is situated in the Museum's first building, which was opened in 1877. The original bird groups were prepared in the first decade of this century under the able direction of Dr. Frank M. Chapman, ornithologist and educator. Eventually the exhibits deteriorated, and the hall had to be closed for renovation. When it was reopened in 1964, it was dedicated to Dr. Chapman in honor of his lifetime of service to the Museum and to the preservation of wildlife.

GREAT HORNED OWL

THE BIOLOGY OF MAMMALS

This hall—ringed with such a wide variety of animals as bats, an egg-laying platypus, rabbits, a horse, and, at the center of them all, a great whale—shows the diversity of that class of animals known as the mammals.

Skeletons and mounted specimens of the common members of all living orders —and the main families to which they belong—are on display. The exhibits also explain the evolution of mammals, in particular their adaptations for special functions, such as teeth modified for herbivorous or carnivorous diets.

Among the many specimens exhibited, one is of particular interest historically. It is the first specimen in the Museum's mammal collection—a lion dating from the middle of the nineteenth century. As in most early examples of taxidermy, the lion's backbone and limbs are made of wood or metal, and its general shape is given by excelsior bound to the framework with string or with plaster.

But it is the whale, not the lion, that dominates this hall. Some 76 feet long, this life-size plaster model of a sulphur-bottom whale went on display early in the century. Through the years it has continued to be one of the Museum's most popular exhibits. The photograph that is used here was taken in 1907 and shows the whale at its best.

The collection of mammals owned by the Museum now numbers about 210,000, mostly in the form of skeletons or skins. As is true of the other impressive collections maintained by the Museum, the specimens are studied not only by the Museum scientists but by researchers from many other institutions of the world.

SULPHUR-BOTTOM WHALE AFTER COMPLETION IN 1907

PRAYING MANTIS

A GATHERING OF MONARCH BUTTERFLIES

INSECTS

At least 350 million years ago a group of animals we now call insects began a course of evolution that has proved to be among the most successful in the animal kingdom. Insects of today are the chief competitors of man. Of the million or more species of all animals, about 700,-000 species are insects.

Among the special exhibits in this hall is one showing how to collect and preserve insects. But it is the social insects that seem to hold particular fascination: visitors are given an insect's-eye view of the nests of ants, bees, and termites. Among the most striking exhibits are the giant insect models. There is a horsefly enlarged 40 times, and malaria-bearing mosquitoes enlarged 75 times. Spiders and scorpions are represented in a small "zoo" of live specimens.

LEFT: HOUSE-FLY

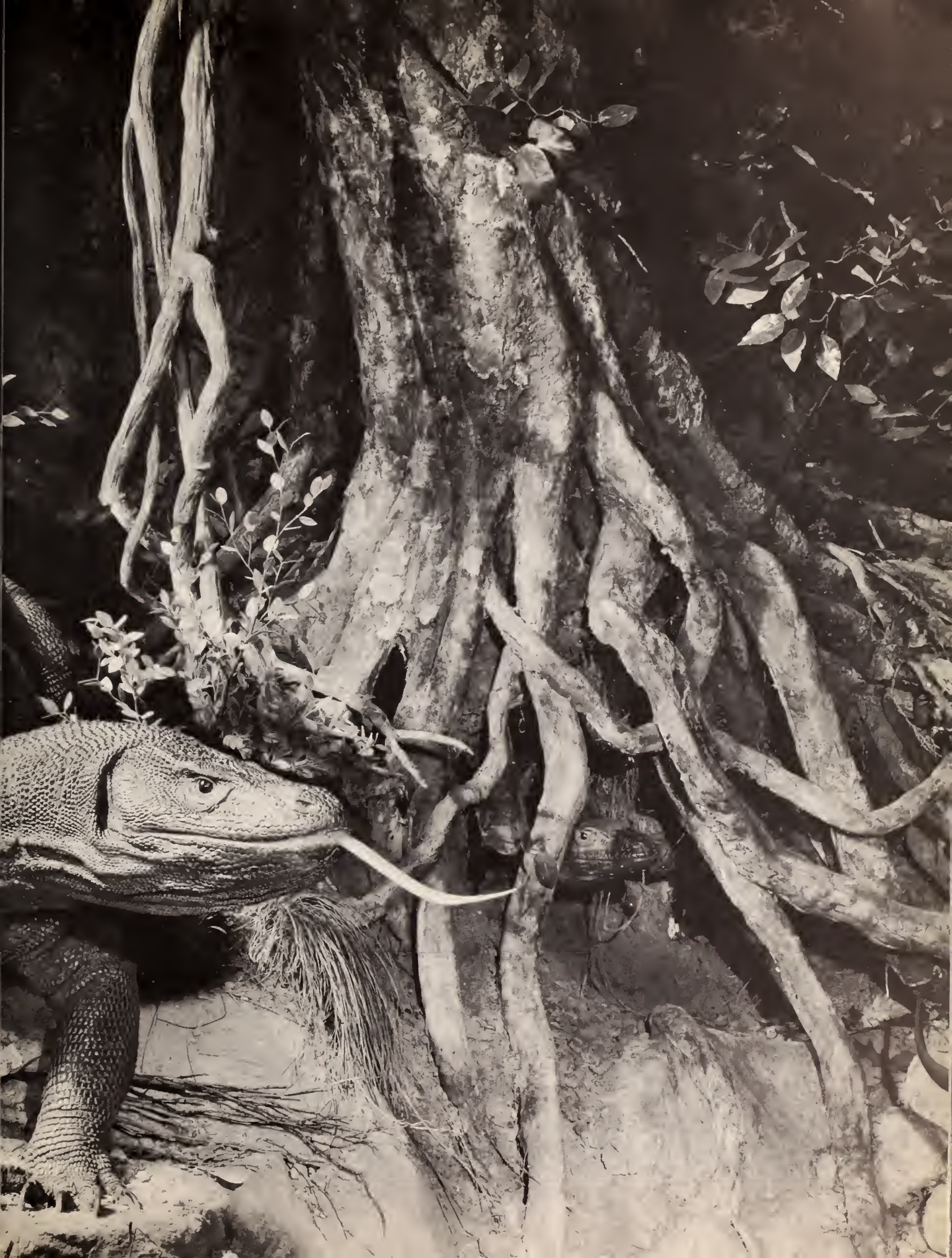
SKELETON OF GABOON VIPER

AMPHIBIANS AND REPTILES

The mounted specimens, skeletons, and models in this hall portray representative species of the reptiles and amphibians. Here a visitor can get nose to nose with an alligator or see a king cobra poised to strike at a mongoose. In addition to the more familiar species, one finds such creatures as the dragon lizard, or giant monitor, pictured here. This 8- to 12-foot-long lizard, the largest now living, is found only on a few islands in the Lesser Sundas.

In addition to displays of individual specimens, the exhibits illustrate various aspects of the biology and behavior of reptiles and amphibians—how they obtain food, how they protect themselves, and how they court and reproduce.

DRAGON LIZARD OF KOMODO ISLAND

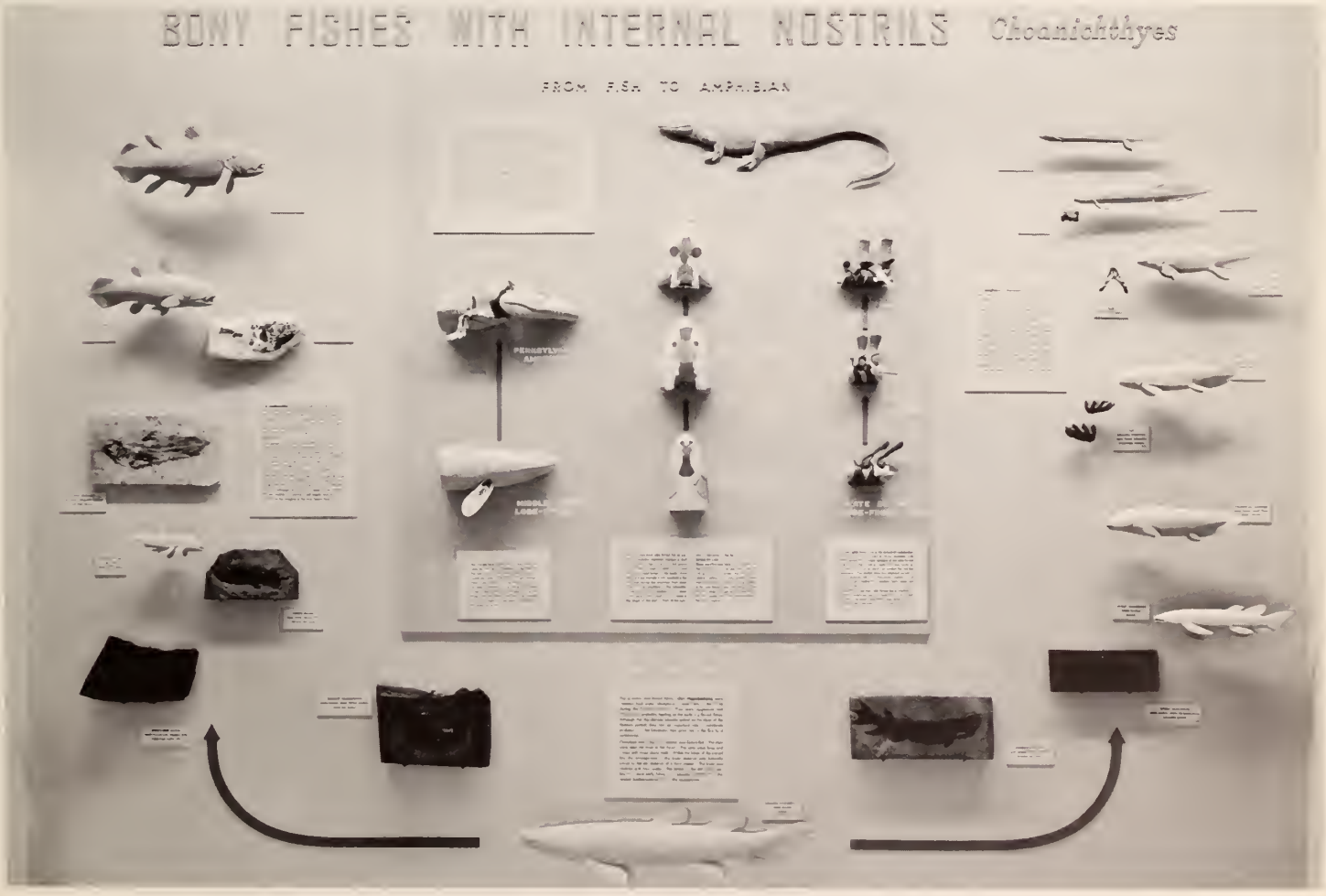


COBRA AND MONGOOSE

FOSSIL FISHES

Highlights of five hundred million years of fish history are portrayed in this small alcove. A visitor enters the alcove by passing under the 9-foot-wide fossil jaws of an extinct shark with teeth 6 inches long. A generalized family tree of fishes illustrates the evolution, classification, and relationships of the four major groups of fishes.

One of the most striking fossils on display is that of *Portheus molossus,* a giant fish that lived in the Cretaceous sea once covering much of central North America. A diorama shows the variety of fishes that inhabited a lake in northern Scotland 300 million years ago. One exhibit explains how a fish might become fossilized. At the entrance to the Early Dinosaur Hall, the lobe-finned fishes that gave rise to the first land-living vertebrates—the amphibians—can be seen in a wall case exhibit.



EARLY DINOSAURS

Preserved in a 19-ton slab of limestone in the Hall of Early Dinosaurs is mute evidence of what may have been a fight to the death between two giants of another era. First are the tracks made by a gigantic brontosaur as it slogged through its prehistoric swamp habitat in what is now Texas. Since there is no impression of a dragging tail, the beast was probably wading in shallow water, looking for the vegetation on which it fed.

Alongside, and in two instances superimposed on the brontosaur tracks, are the characteristic three-toed tracks of a carnivorous allosaur. Reconstructed skeletons of these extinct beasts give the visitor some idea of what must have happened if, as the trackway seems to show, the allosaur was stalking its larger, but more clumsy and less ferocious, prey.

Other exhibits show transition stages from amphibians to the first reptiles, including some reptiles that were ancestral to mammals, others that evolved into the dinosaurs.

One wall case contains a photographic account of how well-preserved dinosaur skeletons were collected in New Mexico in the late 1940's. Another display illustrates special adaptations in feeding, defense, and locomotion among dinosaurs living in different habitats.

THE HALL OF EARLY DINOSAURS

ABOVE: *ALLOSAURUS FRAGILIS*

HINDFOOT OF DINOSAUR *DIPLODOCUS* SHOWN AS IF BEING DUG OUT OF THE GROUND

LATE DINOSAURS

Dinosaurs reached the height of their development about 90 to 120 million years ago during the Cretaceous Period and then, for reasons that are still uncertain, became extinct. In the Hall of Late Dinosaurs, the visitor can see specimens of some of the last of these great reptiles to roam the earth.

In the center of the hall is the skeleton of the largest flesh-eating animal that ever lived, *Tyrannosaurus rex*. It is 45 feet long and about 20 feet high. Displayed with *Tyrannosaurus* are *Triceratops,* a dinosaur with three long, sharp

horns, and *Trachodon,* the "duck-billed" dinosaur. The bones of these ancient reptiles have become fossilized by a process in which the organic material of the bone decays and is replaced by mineral materials from the earth.

A wall exhibit, "The Birth, Life and Death of a Dinosaur," shows the various stages — from egg to adult — of *Protoceratops,* a small and primitive horned dinosaur. The *Protoceratops* specimens were discovered in Outer Mongolia dur-

TYRANNOSAURUS SKULL

PROTOCERATOPS HATCHING

ing the Central Asiatic Expedition of the 1920's, which was led by Roy Chapman Andrews.

The pterosaurs are featured in another exhibit. A flying reptile that appeared when birds were first evolving, the pterosaurs ranged in size from a creature the size of a swallow to the giant *Pteranodon,* which had a 20-foot wingspread.

A display of particular interest is the mummy of a duck-billed dinosaur, which is so well preserved that the leathery texture of the animal's skin can be seen. Usually only the hard bones of a dinosaur are preserved, but in this unusual specimen the carcass became very dry soon after the animal died and the skin hardened over the bones. The carcass was then deeply buried in sediment before it had time to decay.

Most of the bones exhibited in the Hall of Late Dinosaurs are actual fossil remains. When a fossil bone is not available, either an outline of the bone is painted on plaster or the bone is reproduced in plaster.

EARLY MAMMALS

The bizarre animals that ushered in the Age of Mammals—63 million years ago—are brought to life in this hall. The visitor is taken back through millions of years of geologic time to the period when the dinosaurs were on the wane, and quicker, warm-blooded animals came into prominence. It was a time of awesome beasts with horn-studded snouts, tearing claws, and dagger-like teeth, a time when mammalian life was burgeoning as nature was experimenting with new and diverse forms of life.

Skeletons, skulls, and other fossil remains; paintings, charts, and maps show how the early mammals changed structurally as they adapted to new conditions. Some became grazers, or runners; others swimmers, hunters, or fliers; and some, such as the primates, developed grasping arms and hands.

Dominating the Hall of Early Mammals is a spectacular group of fossil skeletons of giant ground sloths and glyptodonts. In the background is a pastel chalk representation of the South American pampas, the favorite habitat of these creatures until they became extinct a few thousand years ago.

Throughout the hall, paintings bring to life the diverse forms of early mammalian life. High on a grassy hilltop above an Asian plain stands *Andrewsarchus,* a creature that lived some 19 million years ago. The largest carnivorous animal that ever walked on land, *Andrewsarchus* was twice the size of the Kodiak bear of Alaska. Near the painting is the beast's skull, the only one known to exist, found by a Museum expedition to Mongolia.

This exhibition also tells the story of fossils. Photographs, drawings, and other graphic materials show how fossils are collected and prepared, identified and classified, studied, and put on exhibition. Techniques of restoring and reconstructing entire animals from fossilized remains are also shown.

A GIANT TORTOISE FROM INDIA

GIANT SLOTHS

ABOVE: AN EARLY CROCODILIAN

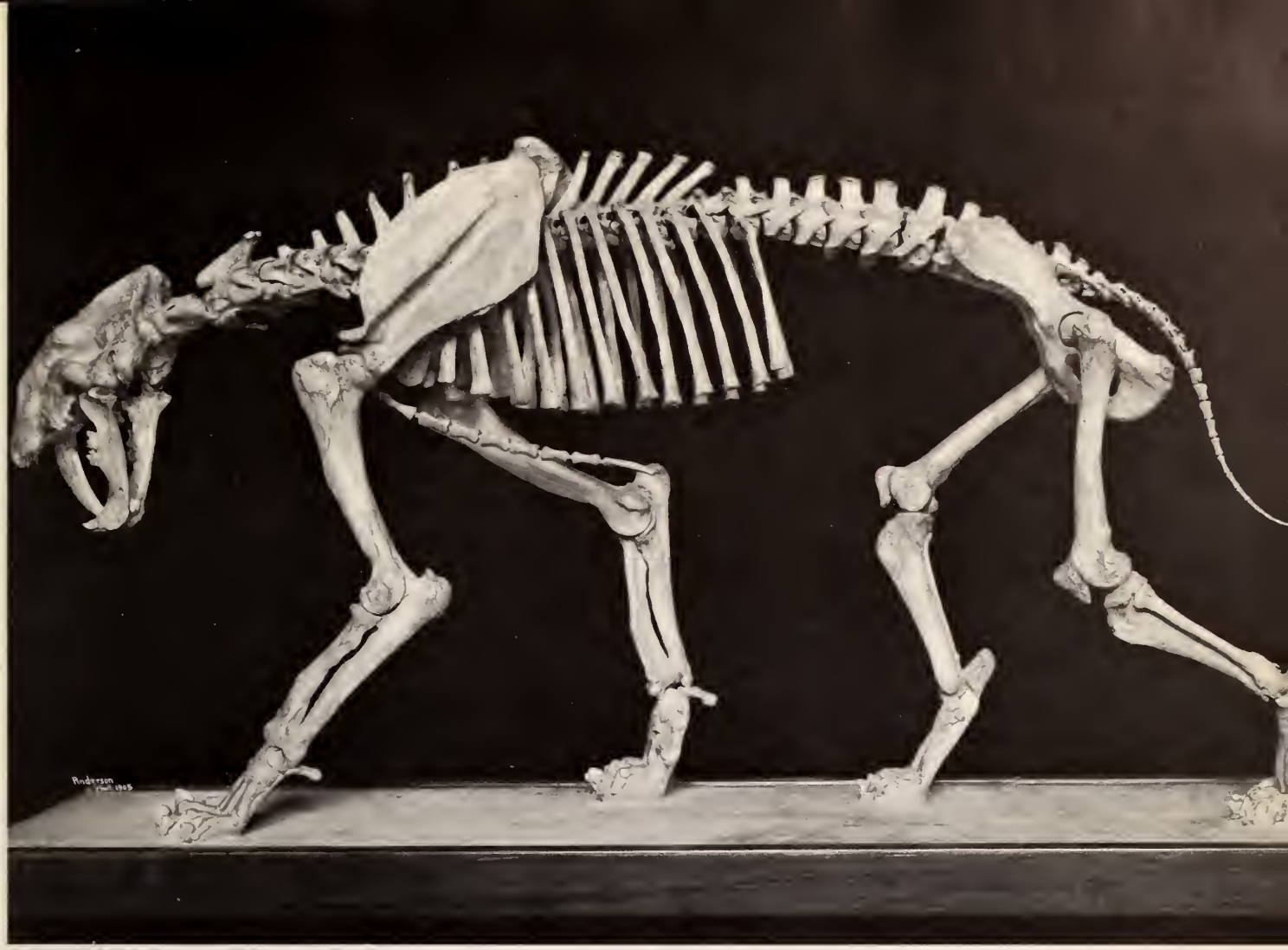
BELOW: *ANDREWSARCHUS*, LARGEST MEAT-EATING LAND MAMMAL

LATE MAMMALS

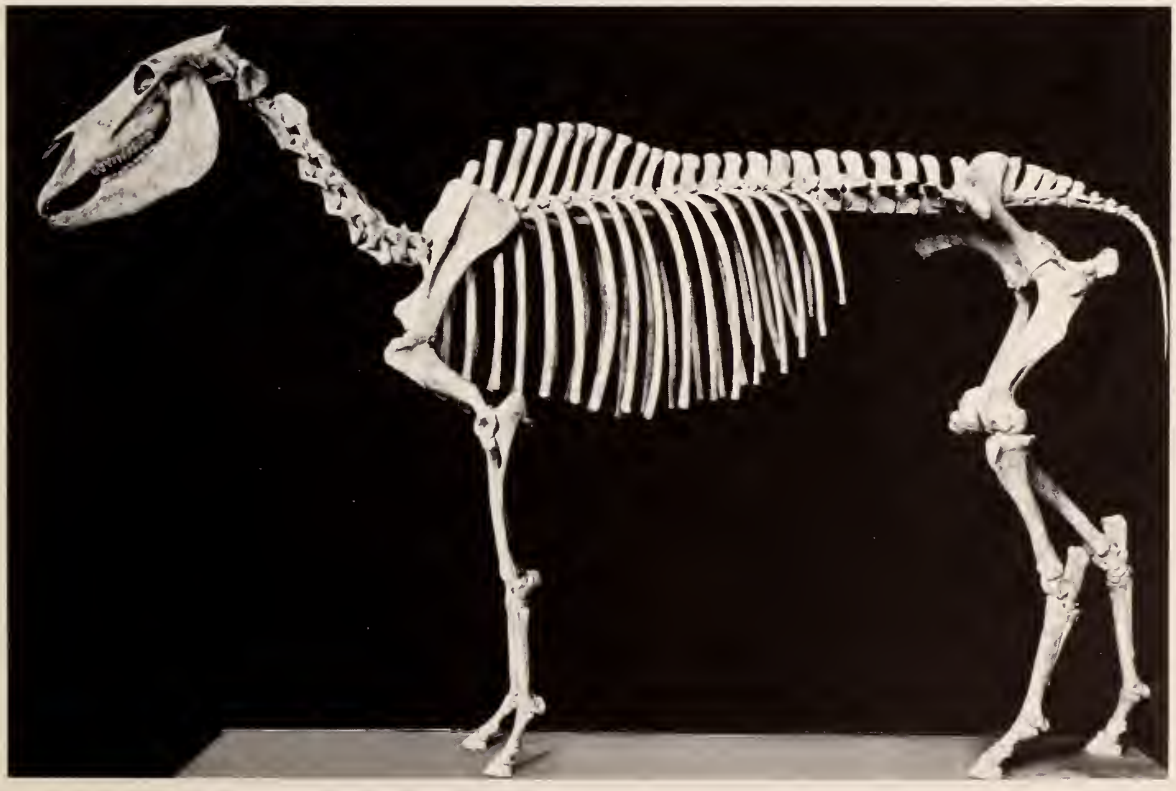
This hall traces the evolutionary history of certain recent mammals such as rodents, bears, weasels, cats, and the rhinoceros. The fossils on display reveal many of the changes that took place in these animals over millions of years before the coming of man. Extinct groups as well as contemporary groups are shown.

One of paleontology's most completely documented cases of evolution is the remarkably full fossil record of the horse. The significant stages in this animal's development, as well as fossils of an early camel, reveal that the evolution of these animals took place in North America. Still another exhibit shows how bones appear when they are found in a fossil quarry.

GROUP OF MIOCENE CAMEL SKELETONS



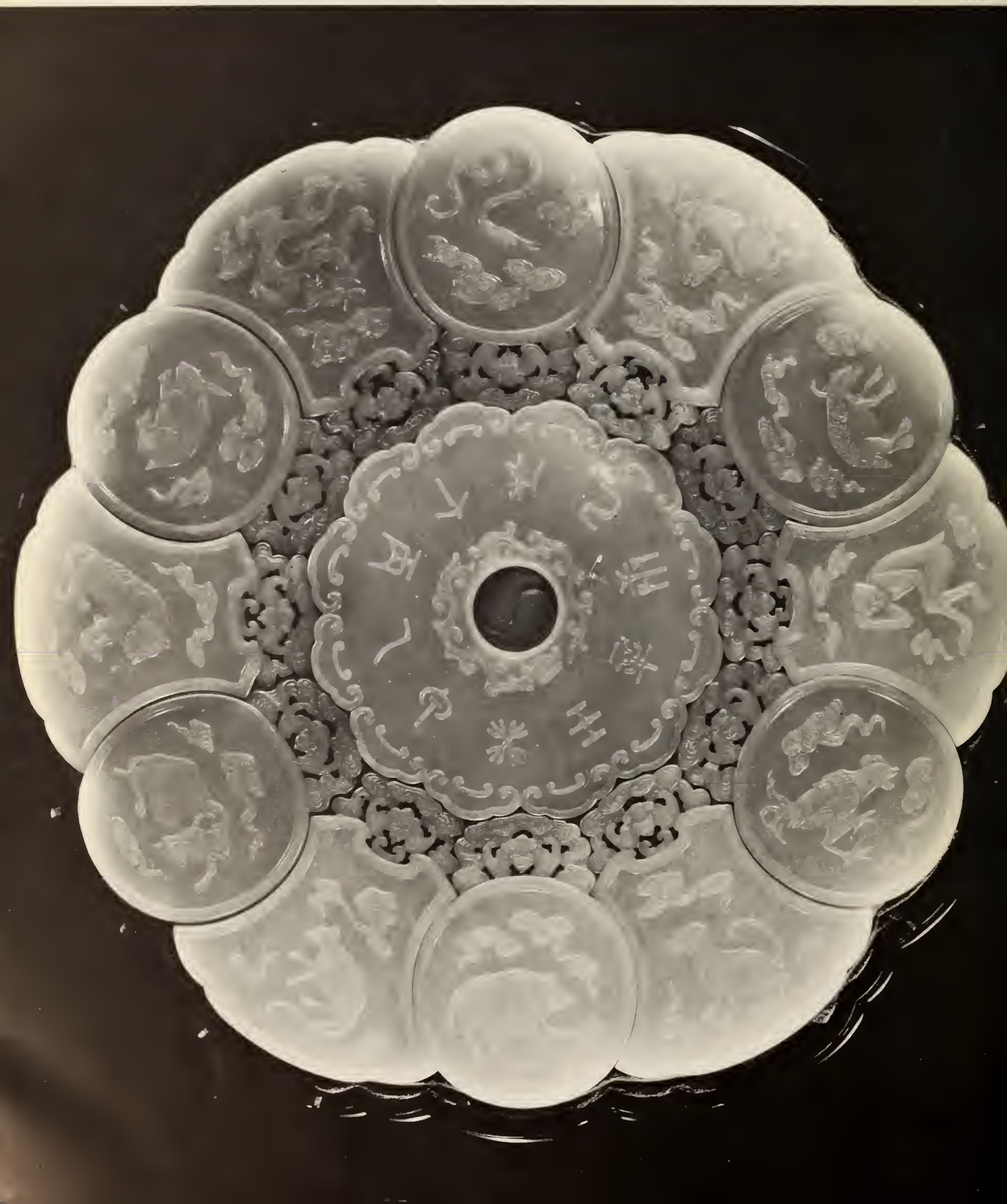
GREAT SABRE-TOOTH TIGER *SMILODON*



EXTINCT NORTH AMERICAN WILD HORSE

MINERALS AND GEMS

WHITE JADE CARVING



Minerals, and the rocks they form, are the building blocks of the earth's crust. They are essential to man since they provide a large portion not only of the soil from which we take our sustenance but also of the raw materials upon which our modern industrialized society depends. Occasionally perfect minerals are found, specimens of such rare beauty that man collects and prizes them as gems.

The world-renowned mineral and gem collections of The American Museum displayed in this hall owe much to the munificent gifts of J. Pierpont Morgan. The exhibits illustrate the nature, formation, and occurrence of minerals, and their technological uses. In addition there is a systematic mineral collection, in which more than 90 per cent of the 2,000 known mineral species are displayed—arranged according to chemical composition.

From simple elements—copper, silver, and gold—to complex compounds containing several elements in combination

LEFT TO RIGHT: MIDNIGHT STAR (SAPPHIRE), STAR OF INDIA (SAPPHIRE) AND STAR RUBY

QUARTZ CRYSTAL

KUNZITE CRYSTAL AND GEMS

such as the amorphous (earthy) mineraloids or perfect crystals, the endless variety of minerals are depicted.

Outstanding features of the collection include the exceptionally well-developed molybdenite crystals from Edison, New Jersey; a paramelaconite crystal, one of only two known specimens; and a wealth of unusually large mineral specimens.

The Star of India (largest known star sapphire), the De Long Star Ruby, and the Midnight Star Sapphire are exhibited along with other priceless jewels. Wall plaques display the names of the many benefactors, notable among whom was William Boyce Thompson. His collection of jade, sapphires, aquamarines, tourmalines, opals, and quartz—some of which are carved into ingenious forms — delights the eye.

Special exhibits periodically presented depict specific aspects of mineralogy. One such exhibit illustrates the use of minerals as keys to the past and shows how the age of rocks and minerals can be determined from small amounts of radioactive elements. The clues unlocked from minerals in this manner read like pages in an earth history. Their study can lead every man to an appreciation of nature and an increased understanding of the world around him.

IVORY CARVING OF JAPANESE FISHERMAN

JADE STATUE
OF BUDDHIST
GODDESS OF MERCY

IN CONCLUSION....

The American Museum of Natural History is many things to many people. It is the world's finest collection of natural history exhibits; it is a great institution of scientific research where more than 100 scientists strive to understand man's past and to improve his future; it is a thriving educational center which offers courses in everything from ancient civilizations to the exploration of outer space.

The Museum is open to the public free of charge. Unfortunately, the great halls, the scientific research, and the educational programs all cost money. Where does the money come from? It comes in part from the City of New York and in part from the Museum's endowment. But it comes in greatest part from people like you, people whose appreciation of the Museum's work inspires both the contributions and Museum memberships which are so essential for dynamic growth. Perhaps your appreciation may find its expression in as meaningful a way.

THEODORE ROOSEVELT MEMORIAL

BACK COVER: THE ZEISS PROJECTOR OF THE PLANETARIUM