Field Museum News

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ALASKAN CARIBOU ADDED TO HALL OF AMERICAN MAMMAL HABITAT GROUPS

By Wilfred H. Osgood
Curator, Department of Zoology

By coincidence rather than design, a group appropriate to the season was completed and opened for exhibition in Hall 16 in December just before the holidays. This is a habitat group of Alaskan caribou or reindeer. That the American caribou are really reindeer is perhaps not generally known. They are, in fact, so closely related to the Old World species from which the domestic reindeer was derived, that in early classifications they were regarded as the same species. In other words, there are wild species of reindeer in both the Old World and the New, but it was only in the Old World that a domestic variety was produced. The name "caribou" is of French-Canadian origin and has become so established for the American animals that it is now almost universally used.

The Museum's group was obtained in consequence of the Thorne–Graves–Field Museum Arctic Expedition, sponsored and led by Bruce Thorne of Chicago, and George Coe Graves II of New York. To this expedition the Museum is also indebted for its group of Pacific walrus. The specimens of caribou were not actually collected by Messrs. Thorne and Graves but it was through their intervention that they were obtained by Alaska Guides, Inc., of which Mr. Thorne is a vice-president, under permit from the United States Biological Survey and the Alaska Game Commission.

Five animals are shown, two large bulls, two adult females, and a young male. They stand rather close together, in keeping with their well-known gregarious habits, on a moss-grown ledge of rock, overlooking a wide panorama of treeless mountain tops. The specimens were collected near Rainy Pass in the general region of Mount McKinley, and the scene in which they appear is characteristic of many mountains in the interior of Alaska.

The Reindeer of America

Group of caribou, installed last month in Hall 16, completing the series of twenty-four North and South American mammal habitat groups. The scene is typical of the mountains of the Alaskan interior.

Caribou belong to the deer family, all the members of which shed and renew their horns annually. As compared with the others, however, they have many peculiarities. Among these is the fact that the females have horns as well as the males. The feet, also, are unusual, the "dew-claws" being large and the hoofs very heavy and broad to prevent sinking in snow and swampy ground. The muzzle is very wide and entirely hairy. A peculiar habit is that of migration, which is rare among mammals. In passing from one feeding ground to another, especially in the fall, caribou often gather in very large herds, sometimes numbering thousands.

The caribou group marks the completion of the Museum's Hall of North and South American Mammal Habitat Groups, being the twenty-fourth and last of the series representing the principal large mammals of the New World. The other North American species included in this hall are: Virginia deer (in four groups showing seasonal changes), mule deer, Olympic elk, Alaska moose, musk-ox, bison, mountain goat, mountain sheep, prongbuck, grizzly bear, Alaska brown bear, glacier bear, polar bear, mountain lion, and beaver. South American subjects are: guanaco, tapir, ant bear, marsh deer, jaguar and capybara (the last two in one group).

The caribou were prepared by Taxidermist Julius Friesser, assisted by Arthur G. Rueckert and W. E. Eigsti. The background was painted by Staff Artist Charles A. Corwin.

TO FIELD MUSEUM MEMBERS:

Field Museum takes this opportunity to thank its thousands of Members for the support they have so loyally given during the trying times which it, like other institutions, has had to face as a result of the worldwide business depression. The membership plays an important part in maintaining the Museum and in making it possible to carry on successfully its educational and scientific missions. Under present conditions, the revenue obtained from membership fees is more than ever a vital factor in the budget of the Museum.

While the stress of the past few years has naturally brought some decline in the number of Members on the rolls, the great majority have continued their support, and this is deeply appreciated by the Museum's Trustees and Officers. On their part the Trustees and Officers have instituted economies wherever possible, in order that the full service of the Museum to the public might be maintained at the most reasonable level of expense. Many projects and activities which would normally be considered necessary have been postponed or suspended pending economic improvement, but the curtailments have been of a character which causes the least interference with the Museum's primary functions as an educational institution.

With full recognition of the loyalty shown thus far by the Members, it is felt that it is now permissible to make a special appeal for further continuation of the Members' support. Likewise, Members are requested to propose the names of possible new Members who might take the places of some of those who, because of financial difficulties, have been forced to resign.

COFFEE PLANTS STUDIED

Field Museum recently received on loan from European herbaria two valuable collections of tropical American plants of the Rubiaceae or coffee family. The Botanical Museum of Berlin forwarded more than 300 sheets. From the Museum of Natural History of Paris there were received 1,850 sheets.

All this material has been determined by Associate Curator Paul C. Standley. Several new species were discovered in it. A large part of the Paris sending consisted of plants collected in Brazil by Auguste de Sainte-Hilaire in 1816–21, and of others gathered in Colombia by José Triana in 1851–57. It was remarkable to find also a specimen collected in Uruguay by Commerson in 1767. It had waited 165 years for study and identification.

Field Museum of Natural History

Founded by Marshall Field, 1893

Roosevelt Road and Lake Michigan, Chicago

Field Museum is open every day of the year during the hours indicated below:

November, December, January 9 A.M. to 4:30 P.M.
February, March, April, October 9 A.M. to 5:00 P.M.
May, June, July, August, September 9 A.M. to 6:00 P.M.

Admission is free to Members on all days. Other adults are admitted free on Thursdays, Saturdays and Sundays; non-members pay 25 cents on other days. Children are admitted free on all days. Students and faculty members of educational institutions are admitted free any day upon presentation of credentials.

The Museum's natural history Library is open for reference daily except Saturday afternoon and Sunday.

Traveling exhibits are circulated in the schools of Chicago by the N. W. Harris Public School Extension Department of the Museum.

Lectures for schools, and special entertainments and tours for children at the Museum, are provided by the James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures.

Announcements of free illustrated lectures for the public, and special lectures for Members of the Museum, will appear in Field Museum News.

A cafeteria in the Museum serves visitors. Rooms are provided for those bringing their lunches.

Chicago Motor Coach Company No. 26 buses go direct to the Museum.

Members are requested to inform the Museum promptly of changes of address.

MEMBERSHIP IN FIELD MUSEUM

Field Museum has several classes of Members. Benefactors give or devise $100,000 or more. Contributors give or devise $1,000 to $100,000. Life Members give $500; Non-Resident (Life) and Associate Members pay $100; Non-Resident Associate Members pay $50. All the above classes are exempt from dues. Sustaining Members contribute $25 annually. After six years they become Associate Members. Annual Members contribute $10 annually. Other memberships are Corporate, Honorary, Patron, and Corresponding, additions under these classifications being made by special action of the Board of Trustees.

Each Member, in all classes, is entitled to free admission to the Museum for himself, his family and house guests, and to two reserved seats for Museum lectures provided for Members. Subscription to Field Museum News is included with all memberships. The courtesies of every museum of note in the United States and Canada are extended to all Members of Field Museum. A Member may give his personal card to non-residents of Chicago, upon presentation of which they will be admitted to the Museum without charge. Further information about memberships will be sent on request.

BEQUESTS AND ENDOWMENTS

Bequests to Field Museum of Natural History may be made in securities, money, books or collections. They may, if desired, take the form of a memorial to a person or cause, named by the giver.

Cash contributions made within the taxable year not exceeding 15 per cent of the taxpayer's net income are allowable as deductions in computing net income under Article 251 of Regulation 69 relating to the income tax under the Revenue Act of 1926.

Endowments may be made to the Museum with the provision that an annuity be paid to the patron for life. These annuities are tax-free and are guaranteed against fluctuation in amount.

ATTENDANCE AGAIN INCREASES

The steady increase in the number of visitors to Field Museum, noted for years past, continued during 1932. At the time of going to press with this issue of Field Museum News there was every indication that the total for the year might reach 1,800,000 persons, as the number up to and including December 18 was 1,789,722, many more than in any previous year of the Museum's history. This represents an increase of about 20 per cent over 1931, when the number of visitors was 1,515,540. The increase in rate is shown by the fact that the 1931 gain over 1930 was approximately 13.5 per cent.

Adding to the attendance figure some 700,000 children reached by extra-mural activities conducted by the James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures, and the Department of the N. W. Harris Public School Extension, it is found that the educational influence of the Museum benefited a total of approximately 2,500,000 persons in 1932.

The year 1932 was the sixth consecutive year in which attendance exceeded one million. It is interesting to note that the total for the past five years has been approximately 6,840,000, or about 1,000,000 more than the total of 5,839,579 visitors received in the entire twenty-five years and some months during which the institution was located in its first building in Jackson Park.

STANLEY FIELD LABORATORIES CREATE UNIQUE EXHIBITS

By B. E. Dahlgren
Acting Curator, Department of Botany

The exhibits in the Hall of Plant Life (Hall 29) represent the most notable effort made in any Museum to provide a display of plants instead of only plant materials and products.

During the early years of the Museum's existence the absence of any means of exhibiting plant forms constituted a formidable obstacle to the development of interest in botany. The poor appearance of dead plants has always been discouraging to those who have attempted to make a museum botanical display. It is probably to this fact that one must ascribe the absence of botanical exhibits in most natural history museums, often extending even to the failure to recognize the plant kingdom as existent. It was generally considered to be next to impossible to produce a satisfactory permanent museum exhibit of plant forms as they appear in the natural living state.

In recent years, however, great advances have been made in museum technique. A higher standard of skill and of artistic performance, guided by scientific considerations, has come to be applied to the preparation of exhibits. Perishable forms that once were the despair of the museum expert are today represented by reproductions so well executed that they are scarcely distinguishable from the living plants. In the same manner it has become possible to show satisfactory representations of details of structure and to include lifelike models of microscopic forms of plants and animals.

An effort made in 1909–10 at Field Museum to solve the problem of botanical exhibits resulted in the production of the breadfruit, papaya, and several other cases now in the Hall of Plant Life, and served to establish fairly definitely the form and general character of the exhibits in this hall. This also made it evident that the production of a satisfactory botanical exhibition would require careful planning, collecting in near-by and distant localities, and continuous employment of skilled and specially trained workmen.

In 1916 President Stanley Field personally undertook to carry the considerable expense of the continuation of this work. The Stanley Field Plant Reproduction Laboratories of the Museum have since functioned as a part of the Department of Botany and have provided the altogether unique exhibits that are gradually filling the large Hall of Plant Life.

The collection as a whole is designed to present a general view of the plant world, past and present, by showing typical forms characteristic of its main divisions from bacteria upwards. The flowering plants shown constitute the larger part of the display and include a large number of useful and interesting plants that are of particular importance to man.

Material for exhibits of plants not of local occurrence, has been obtained by special Museum expeditions. Specimens have been gathered and studies at first hand made in several tropical American countries, especially those known for their botanical gardens, such as Jamaica and British Guiana. These contain many important plants of distant parts of the world and often afford special facilities for the work that must be carried out in the field as a preliminary to the preparation of exhibits in the Museum laboratories.

Though much still remains to be done before this collection can be considered to be well balanced and representative, it may confidently be asserted that in no other museum, and in no botanical garden even under the best of conditions, can so many important plants from so many different places be seen at one time in their most characteristic state of flowering and fruiting as in the Hall of Plant Life in Field Museum.

Long Mining Drill Cores Shown

Much prospecting for mineral deposits is done by diamond drill, consisting of a rotating pipe armed at its lower end with diamond teeth. The teeth grind a ring of rock, leaving a central core which passes into the pipe and can be raised for study. Two drill cores exhibited in Frederick J. V. Skiff Hall (Hall 37) attract the attention of mining men on account of their length. Although records of the rock passed through in thousands of feet of drilling are often secured, the individual pieces of core are usually short, due to the brittleness of rock. One of the cores in the Museum, a cylinder of limestone six feet seven and one-half inches long, and two inches in diameter, was drilled from a depth of 670 feet at Waltonville, Illinois. This was thought to be the longest bit of core ever taken out in one piece until a longer piece came to the Museum from Colorado. The core from Colorado is a granite cylinder ten feet long, and two inches in diameter.

Research on Extinct Whales

Dr. Remington Kellogg of the Carnegie Institution, Washington, D.C., recently spent some time at Field Museum making an exhaustive study of the fossil whale skull brought from Patagonia by the Marshall Field Paleontological Expedition to that country. Dr. Kellogg is preparing a monograph on extinct whales.

CHINA EXPEDITION SENDS 4,000 ANIMAL SPECIMENS

The final shipment from the Marshall Field Zoological Expedition to China, consisting of more than 4,000 specimens of Asiatic animals, was received at Field Museum in December. About 1,500 specimens had been received earlier in the year.

The work of the expedition, which was begun in the latter part of 1930, has now been concluded, and Floyd T. Smith, New York zoologist who was its leader, has returned. The only white man on the expedition, he had many adventures and narrow escapes from bandits and from natural perils in war-torn and flood-ravaged regions.

The last shipment includes about 1,500 mammals, 1,000 birds, 500 fishes, and more than 1,000 frogs, lizards, snakes and turtles. With this vast addition to its collections, and the material received from expeditions which have worked in other parts of Asia during recent years, Field Museum takes a place among the leading scientific institutions for the study of Asiatic fauna, according to Dr. Wilfred H. Osgood, Curator of Zoology.

Seven specimens of the rare takin, a curious goat-antelope which inhabits the Himalayas, stand out among the collections obtained by the expedition. These are to be used in a habitat group in William V. Kelley Hall (Hall 17). Both sexes, and various ages from young to full-grown, are represented among the seven.

The expedition also obtained two specimens of the rare giant panda. Among the birds is a striking new species of bamboo partridge. Curator Osgood expects that when a thorough checkup of the thousands of specimens has been made there will be revealed numerous other birds and animals hitherto unknown to scientists. The Metropolitan Museum of Natural History at Nanking cooperated with the expedition, and a share of the specimens has been designated for it.

LARGE GEODE PRESENTED BY TRUSTEE CHALMERS

By Oliver C. Farrington
Curator, Department of Geology

A geode unusual in size and remarkable for the brilliancy of the crystals it encloses was added last month to the crystal collection in Hall 34. It was presented by William J. Chalmers of the Board of Trustees, who for a long time has been a generous donor to this collection. The geode is from Hamilton, Illinois, an area within which strata of Lower Carboniferous or Mississippian age are characterized by the occurrence of these bodies. The geodes range in size from about that of a pea to, in rare instances, nearly two feet in diameter. The one just presented by Mr. Chalmers is 22 inches in diameter and weighs 125 pounds.

Geode is a name applied to more or less hollow balls of rock which in their most interesting form have the interior lined with brilliant crystals. They are characteristic of certain formations. One of the most important areas producing them is in two counties bordering the Mississippi River—Lee County in Iowa and Hancock County in Illinois. The beds of limestone and shale in this locality are characterized by having intercalated in their layers large numbers of these hollow balls. They are composed mostly of quartz. These balls weather out as the rock is dissolved or otherwise disintegrated, and are left behind in streams and on banks from which they can be detached.

While the appearance of these balls is rough and unattractive on the exterior, a skillful blow of a hammer often cracks open the object to reveal an interior lined with brilliant and beautiful crystals. These crystals include quartz, calcite, sphalerite, hematite, magnetite, gypsum, pyrite and other minerals, sometimes two or more occurring in the same geode. Often they are also filled with water, and frequently bitumen is enclosed.

The question of what causes the cavity of the geode and how the crystals get into it is one that has been much discussed, but for which no generally accepted answer has yet been given. Many of the geodes are supposed to occupy spaces made by the removal of fossils, but there are other occurrences for which this explanation is not satisfactory. If the fossil is a bivalve shell, it is easy to understand how the substance of the shell could be replaced by silica, and the interior then lined with crystals of quartz and other minerals by infiltrating waters.

It is further known that infiltration of water may dissolve the interior substance of fossils and the cavity later be filled by other deposits. In the vicinity of Tampa, Florida, large fossil corals are found, the interiors of which have been entirely removed by percolating waters. Usually cavities thus formed are lined by layers of chalcedony, the lime of the fossil probably having precipitated the silica from the percolating waters. There are large areas, however, where geodes occur in abundance, where there are no evidences of the existence of fossils which could have been the source of the geodes.

Remarkable Geode

This specimen, presented by William J. Chalmers, is 22 inches in diameter, and weighs 125 pounds. Its interior is lined with unusually brilliant crystals.

Death of Dr. W. J. Holland

In the death of Dr. William J. Holland, which occurred at Pittsburgh on December 13, the museum fraternity has lost one of its most colorful associates. Dr. Holland, who was 84 years old, had been the first director of the Carnegie Museum, and for the last ten years was its director emeritus. Dr. Holland was best known for his scientific contributions to entomology and paleontology, and had been honored by the foremost scientific bodies throughout the world. Field Museum joins other institutions in expressing to the Carnegie Museum its sorrow in the passing of a great man.

LIFE OF ANCIENT EGYPTIANS ILLUSTRATED IN EXHIBITS

The sources of much of our knowledge of the life and history of the ancient Egyptians are exemplified by a large collection of Egyptian tomb sculptures and paintings, as well as by casts of sculptures whose originals are still in place in Egypt, which occupy several large new exhibition cases in the hall of Egyptian archaeology (Hall J).

The original sculptures and paintings which are exhibited at the Museum represent periods ranging from 3000 B.C. to 1100 B.C., including the Old and Middle Kingdoms and the Empire, and embracing dynasties from the third to the twentieth. They were brought from the cemeteries of Memphis, Gizeh and Sakkara.

The prayers for the dead, inscribed on many of the stones, are often curious, and interesting for the insight they give into Egyptian ideas of bliss and Egyptian vanities. That for an official of high rank pleads for "bread and beer on every feast day and every day," as deciphered by Dr. T. George Allen, Assistant Curator of Egyptian Archaeology, while on the tomb of a lady named Ipi appears a modest petition for "1,000 loaves of bread, 1,000 jars of beer, 1,000 alabaster vases of ointment, and 1,000 garments." From the tomb of another official comes a slab identifying him as "seal bearer of the king and sole companion of the king"—upon which Dr. Allen comments that the frequently claimed distinction of "sole companion" was one in which, contradictorily, many persons shared. Thus some light is thrown upon the state of Egyptian politics.

These specimens come from the tombs of a varied assortment of citizenry, including an overseer of craftsmen, royal courtiers, governors of provinces, artists, the "overseer of the palace's double storehouse of gold," scribes, granary officials, a clerk of the pharaoh's archives, and persons of humbler estate. Artistically the collection includes some of the finest work of the Egyptians, and some amateurish and ordinary hack work too, in order to present a complete archaeological concept of the subject.

In the casts exhibited of sculptures the originals of which are still in Egypt are seen pictures in low relief illustrating historic events, and the daily activities of Egyptian life. One group records the capture of a few towns in Palestine, when King Sheshonk I of Egypt defeated Solomon's son Rehoboam about 930 B.C. The names of the captured cities—Taanakh, Shunem, Rehob, Mahanaim, Gibeon, Ajalon, and Megiddo—are inscribed in walls composed of representations of the lined up bodies of bearded Semites. The scenes of everyday life include hunters returning with their spoils, boatmen fighting, boys engaged in gymnastics, musicians at a festival, the slaughter of oxen, bringing offerings of animals and foods to a tomb, plowing with oxen, donkeys threshing grain, cattle crossing a stream, building of boats both of wood and of papyrus, cabinet makers at work, girl dancers, vintage scenes, and hunting with hounds. One particularly interesting picture is that of "bringing village officials for a reckoning"—that is, punishment for delinquent taxes.

The foraminifera, tiny marine animals of 100,000,000 years ago, whose fossilized bodies form great chalk deposits, are represented by thirty enlarged models of as many distinct forms in Ernest R. Graham Hall. Some of the fossils reveal great beauty of form.

THE ORIGIN AND ANTIQUITY OF AMERICAN INDIANS

By Paul S. Martin
Assistant Curator of North American Archaeology

Field Museum is noted for its comprehensive and excellent exhibits relating to the American Indians. In viewing these there must be many visitors who wonder whence came the American Indian, and when. While there is no written history on this subject, there have been reams of speculation on the origin and antiquity of the Indian, and an examination of the available facts and theories makes possible what seems to be a reasonably correct conclusion.

Anthropologists have designated three grand divisions of humanity: the Caucasoid, the Negroid, and the Mongoloid. Most of the smaller sub-divisions of racial types belong to one of these. The majority of anthropologists agree that the American Indians are a branch of the Mongoloid division. This does not mean that they are Chinese in origin, but rather that they and the Mongolians both sprang from an original proto-Mongoloid stem or ancestry.

This quite well-known theory is still open to question, but it may be supported by an explanation of how it was reached. In distinguishing one race from another the anthropologist relies upon accurate recorded observations and measurements of certain physical characteristics, such as length and breadth of head and face, size of the nose, distance between the eyes, and the stature. In addition, careful studies are made of the color of hair, skin and eyes; the shape of the hard palate, certain teeth, and the hair, in microscopic cross-section. No single trait may ever be used in differentiating one race from another—observations of many must be made. To state that because an individual has prominent cheekbones he is Mongoloid would be unsound and as likely as not incorrect.

The correlation of a mass of such detailed data as has been indicated above, however, has led to the conclusion that the Indians should be classified as Mongoloid, and it is now generally agreed that they came to the New World in a series of small, dribbling migrations via Bering Strait.

In regard to the length of time man has inhabited the New World we enter a realm where there are fewer facts to guide us. It is often claimed that man lived in North America during the Ice Age (about 25,000 to 50,000 years ago). But as yet not a single fragment of a skeleton of a Neanderthal type has been found. The most ancient skeletal remains that have as yet come to light have been correctly classified as Indian, and they differ in no important way from those of the modern Indian.

If, then, man did not live in America during the last Ice Age, when did he arrive? The only acceptable answer to this question in the light of present knowledge is arrived at by considering the pre-history of the Old World. We know that approximately 8,000 to 10,000 years ago, barley, rice, millet, and wheat were cultivated, and cattle, pigs and sheep were domesticated there.

Since it seems fairly well established that the Indians came from Asia, it seems reasonable to expect that they would have introduced some or all of these plants and animals into the New World. But until the arrival of the Europeans in the fifteenth and sixteenth centuries, at which time these plants and animals were introduced, not a single one of them had been used, or even known, in the New World. Therefore, it is reasonably safe to assume that the migration to the New World was prior to the development of agriculture and husbandry and after the recession of the last glacier. In consequence the conclusion is logically reached that the date of the entry of the American race into the New World was probably between 10,000 and 25,000 years ago.

BLACKJACKING FISH TO CATCH THEM

By Karl P. Schmidt
Assistant Curator of Reptiles

Probably most people remember being told in childhood that the way to go about catching a rabbit, squirrel, bird, or other small animal was "first to put salt on its tail." Then, too, there is the story about the man who reputedly made a fortune by advertising in agricultural papers: "Send one dollar for sure method of killing potato bugs and other pests." Thousands of farmers are said to have sent this man their dollars, in exchange for which they received a printed slip of paper reading: "Take two shingles. Place potato bug on one, and strike with the other."

To the fisherman accustomed to matching his wits against such game creatures as bass and muskellunge, the idea of going after a fish with a rock, and stunning it into unconsciousness to catch it may seem as ridiculous as salting the rabbit's tail or exterminating insects with shingles. However, this method of fishing is successfully employed by Indians in Central America.

During a collecting expedition in Honduras, I was located for some time at the mouth of the Santa Ana River. This is a mountain stream and its bed is strewn with rocks. During low water we found it almost impossible to employ even a small seine. The fish were shy and took refuge under the rocks at the slightest alarm, which made it impossible to catch them with a dip net. The fish poisons used by the natives in many parts of tropical America were unknown in this region.

An Indian girl from Salvador showed us the novel method of catching fish by stunning them, which, she said, was well known to the Indians of mountainous districts in Salvador. It consists in wading the stream armed only with a dish pan, in which the fish are to be placed. On approaching a pool, one observes under which of the larger rocks the most promising fish hide. Taking a stone about as large as one can easily raise over one's head, one throws it with as much force as possible on this rock. The concussion stuns even the larger fish, which probably lie with their backs in contact with the rock, and apparently it is transmitted to the water beneath the rock sufficiently to stun the smaller ones. It is important to turn over the rock at once, or to feel under it, before the fish recover. Small fish as well as large ones are taken.

The chief kinds of fish in the Santa Ana River were a small silvery characin called "sardinas" by the natives, several species of the sunfish-like cichlids, and a small catfish.

When we had only a few hours to spare, in the central highland of Honduras, we were able to collect fish by this method from a mountain brook. While it requires both patience and effort, I believe that it occasionally affords an invaluable supplement to the methods available for the collection of fishes for scientific purposes, as well as for the frying pan.

JANUARY GUIDE-LECTURE TOURS

Conducted tours of exhibits, under the guidance of staff lecturers, are made every afternoon at 3 P.M., except Saturdays, Sundays, and certain holidays. Following is the schedule of subjects and dates for January:

Week beginning January 2: Monday—New Year's holiday, *no tour;* Tuesday—Animal Groups; Wednesday—Philippine Hall; Thursday—General Tour; Friday—South America.

Week beginning January 9: Monday—Prehistoric Life; Tuesday—Java, Borneo, Sumatra; Wednesday—Indian Costumes; Thursday—General Tour; Friday—Primitive Musical Instruments.

Week beginning January 16: Monday—Animal Life in Cold Lands; Tuesday—Crystals and Gems; Wednesday—Plant Families; Thursday—General Tour; Friday—Egypt.

Week beginning January 23: Monday—Bird Habitat Groups; Tuesday—Primitive Metal Workers; Wednesday—Plants of Economic Value; Thursday—General Tour; Friday—The Mound Builders.

Week beginning January 30: Monday—Shields and Weapons; Tuesday—Chinese Arts.

Persons wishing to participate should apply at North Entrance. Tours are free and no gratuities are to be proffered. A new schedule will appear each month in Field Museum News. Guide-lecturers' services for special tours by parties of ten or more are available free of charge by arrangement with the Director a week in advance.

Gifts to the Museum

Following is a list of some of the principal gifts received during the last month:

From School of Forestry, Yale University—57 herbarium specimens, Colombia; from Companhia Ford Industrial do Brasil—23 herbarium specimens with accompanying wood specimens, Brazil; from Desert Laboratory—47 herbarium specimens, Arizona and Mexico; from Dr. Forrest Shreve—an Ephedra bush, Arizona; from Michigan State College—23 wood specimens, Philippines, Chile, and United States; from William J. Chalmers—large quartz geode, Illinois; from B. E. Dahlgren—7 specimens diamonds in matrix, 15 specimens euxenite, 5 miscellaneous minerals, Brazil; from Frank Von Drasek—69 specimens minerals, ores, and fossils, New Mexico; from A. T. Newman—30 limonite concretions, Wisconsin, and 4 sand-calcite concretions, South Dakota; from N. H. Seward—2 meteorites and a fire opal, Australia; from Col. Theodore Roosevelt—999 shells, Philippine Islands; from Elm Place School—a bird skeleton and a sharp shinned hawk; from Miss Bertha Cramer—an old squaw duck skin, Illinois; from Walter A. Weber—skeletons of a kingfisher and a white-winged scoter, Illinois; from John M. Simpson and A. Watson Armour III—3 topi and 3 gnu, Tanganyika, Africa; from Stuart L. Thompson—100 beetles and 4 bugs, Canada; from John G. Shedd Aquarium—a hawkbill turtle; from Dr. H. F. Strohecker—30 grasshoppers and 4 katydids, Georgia; from Misses N. V. and R. W. Haynie—435 butterflies and 9 moths; from Mrs. Frank O'Connell—a small boa; from E. Brundage, Jr.—120 insects, Illinois, Michigan, and North Carolina; from John T. Pirie—a red-shouldered hawk, Chicago area.

NEW MEMBERS

The following persons were elected to membership in Field Museum during the period from November 16 to December 15:

Associate Members

Edward L. Glaser, Cornelius J. Groot, Mrs. Olive Beaupre Miller.

Annual Members

Mrs. W. E. Burch, Joseph F. Chelius, E. K. Collison, Dr. Clinton A. Elliott, Lawrence A. Groot, Robert J. Hart, Frank J. Herlihy, Mrs. George H. High, Al Jourdan, L. B. Logan, Miss Mabel McKay, James Dougan Norris, Charles W. Schwede, John A. Williamson.

Mastodon Teeth on Exhibition

An exhibit of the teeth of North American mastodons, comprising specimens from the jaws of animals of various ages from baby mastodons of a few months to animals fifty or more years old, is to be seen among the collections in Ernest R. Graham Hall (Hall 38). The specimens are from a bog near Minooka, Illinois, in which many of the animals became mired and died.

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THE CHICAGO CORAL REEF 400,000,000 YEARS AGO

By Henry W. Nichols
Associate Curator of Geology

Four hundred million years ago the site of Chicago was submerged under the waters of a great interior sea which covered the northern part of what is now the Mississippi Valley. The limestone which underlies the city was the bed of this shallow sea, and it contains many fossilized remains of the stony skeletons of marine animals. Study of these fossils enables geologists to present a fairly complete description of the local life and conditions of that time.

This sea was an offshoot of the Arctic Ocean, but at that time the Arctic waters were warm and the climate subtropical. Conditions at Chicago especially favored coral growth, and masses and reefs of coral were the dominating features of this primeval scene. The coral is a small primitive animal, little more than a tube of flesh with a mouth and crown of tentacles on its upper end. It rests upon a pedestal of limestone which it builds from lime extracted from the sea water. There were many single corals, each growing on its own pedestal, but the impressive features of the seascape were the colonies of compound corals where many animals grew together, their stony pedestals coalesced into one large mass. The individual corals were small, seldom exceeding a quarter of an inch in diameter, but the colonies were large. Some took the form of domes; other cylindrical branching forms resembled grotesque trees. At this time corals had just acquired the reef building habit, and a great coral reef which has been exposed in what is now a quarry at Stony Island Avenue and Ninety-first Street was among the first such reefs formed. Resemblance to modern reefs was increased by the presence of the more delicate bryozoa. These resembled corals but were slender and grew in intricate network patterns. Many assumed fan or leaf forms. Others were branching or netted threads which incrusted the coral.

There were also the crinoids, which, with their small round bodies and feathery tentacles growing on long, flexible stems, look so much like flowers that they are called stone lilies. Sponges and shellfish also grew attached to the bottom but in lesser numbers. Not all the animals were attached to the sea bottom—there were crawling and swimming forms as well. The scavenger trilobites with the habits and much of the appearance of crabs, were common. The cephalopods, the most highly developed animals of these seas, were numerous. They were related to the octopus and squid, but unlike these were provided with shells. There were a number of varieties. Some had coiled shells, and others, including the largest and most common, had long, straight, pointed shells.

Other animals were present in smaller numbers and there must have been vegetation to support the abundant animal life, but this vegetation, confined to the lower orders of plant life, had no hard parts to become fossils, so that we know little of it.

Although this scene, if we could view it, would be strange in detail, its general aspect must have been very like that of a modern coral reef and, in fact, less strange to us than most landscapes of that remote time or even of times much more recent. A restoration of the Chicago reef forms the subject of one of the twenty-eight mural paintings by Charles R. Knight, exhibited in Ernest R. Graham Hall (Hall 38). The painting is reproduced in the illustration accompanying this article.

The Site of Chicago, 400,000,000 Years Ago

Mural by Charles R. Knight restoring the Chicago coral reef, as science indicates it probably appeared. The land where the city now stands was then submerged beneath the Arctic Ocean, which in those days was a tropical sea. This painting is on exhibition in Ernest R. Graham Hall.

Supposedly magic ornamental daggers, hatchets, war clubs, tridents and other weapons used by Lama priests of Tibet in exterminating demons and enemies of Buddhism, are on exhibition in Hall 32.

SCULPTOR COMPLETES BRONZES OF ORIENTAL PEOPLES

Miss Malvina Hoffman of New York and Paris, distinguished sculptor commissioned by Field Museum to prepare 110 life-size bronze statues, busts and heads representing the principal living races of mankind for exhibition in Chauncey Keep Memorial Hall, recently returned to America. About two-thirds of her task is now completed. On her last journey she was engaged in extensive studies of the peoples of Asia and the South Pacific, and, during a subsequent sojourn at her Paris studios she made the finished bronzes of figures modeled in clay during her travels. Last month Miss Hoffman spent a week at the Museum at work upon various details in connection with the Keep Hall project.

Before undertaking her work in the Orient, Miss Hoffman had made the figures illustrating types of the peoples of Europe, Africa, and America. Early in the autumn of 1931 she sailed from San Francisco for the Far East. She was accompanied by Samuel B. Grimson, her husband, who acted as photographer of the expedition; Miss Gretchen Greene, secretary and manager; and Jean de Marco, who made the plaster casts. The party visited Honolulu, Japan, China, the Philippines, Bali, Java, Singapore, Penang, the Malay Peninsula, Calcutta, Delhi, Jaipur and Colombo.

Everywhere Miss Hoffman was received with the greatest cordiality and enthusiasm, and local anthropologists rendered valuable assistance. Museums and hospitals were placed at the artist's disposal, and in them she made her headquarters for studying, measuring, photographing, and modeling the best available living representatives of the racial types desired.

The Bishop Museum of Honolulu accorded Miss Hoffman full cooperation, and there she modeled a life-size portrait-head of a Hawaiian youth, and another of a Samoan. She also made a life-size drawing of a Samoan chief. At Tokyo Miss Hoffman modeled life-size heads of a Japanese man and woman. She then made a trip to the island of Yezo, home of the Ainu, where she obtained as subjects for study a typical old Ainu man and middle-aged woman. The data, measurements, and photographs

(*Continued on page 2*)

Field Museum of Natural History

Founded by Marshall Field, 1893

Roosevelt Road and Lake Michigan, Chicago

Field Museum is open every day of the year during the hours indicated below:

November, December, January 9 A.M. to 4:30 P.M.
February, March, April, October 9 A.M. to 5:00 P.M.
May, June, July, August, September 9 A.M. to 6:00 P.M.

Admission is free to Members on all days. Other adults are admitted free on Thursdays, Saturdays and Sundays; non-members pay 25 cents on other days. Children are admitted free on all days. Students and faculty members of educational institutions are admitted free any day upon presentation of credentials.

The Museum's natural history Library is open for reference daily except Saturday afternoon and Sunday.

Traveling exhibits are circulated in the schools of Chicago by the N. W. Harris Public School Extension Department of the Museum.

Lectures for schools, and special entertainments and tours for children at the Museum, are provided by the James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures.

Announcements of free illustrated lectures for the public, and special lectures for Members of the Museum, will appear in Field Museum News.

A cafeteria in the Museum serves visitors. Rooms are provided for those bringing their lunches.

Chicago Motor Coach Company No. 26 buses go direct to the Museum.

Members are requested to inform the Museum promptly of changes of address.

MEMBERSHIP IN FIELD MUSEUM

Field Museum has several classes of Members. Benefactors give or devise $100,000 or more. Contributors give or devise $1,000 to $100,000. Life Members give $500; Non-Resident (Life) and Associate Members pay $100; Non-Resident Associate Members pay $50. All the above classes are exempt from dues. Sustaining Members contribute $25 annually. After six years they become Associate Members. Annual Members contribute $10 annually. Other memberships are Corporate, Honorary, Patron, and Corresponding, additions under these classifications being made by special action of the Board of Trustees.

Each Member, in all classes, is entitled to free admission to the Museum for himself, his family and house guests, and to two reserved seats for Museum lectures provided for Members. Subscription to Field Museum News is included with all memberships. The courtesies of every museum of note in the United States and Canada are extended to all Members of Field Museum. A Member may give his personal card to non-residents of Chicago, upon presentation of which they will be admitted to the Museum without charge. Further information about memberships will be sent on request.

BEQUESTS AND ENDOWMENTS

Bequests to Field Museum of Natural History may be made in securities, money, books or collections. They may, if desired, take the form of a memorial to a person or cause, named by the giver.

Cash contributions made within the taxable year not exceeding 15 per cent of the taxpayer's net income are allowable as deductions in computing net income under Article 251 of Regulation 69 relating to the income tax under the Revenue Act of 1926.

Endowments may be made to the Museum with the provision that an annuity be paid to the patron for life. These annuities are tax-free and are guaranteed against fluctuation in amount.

MUSEUM ACTIVITIES REACHED 2,500,000 DURING 1932

Approximately 2,500,000 persons were brought directly within the sphere of Field Museum's educational influence during 1932, it is shown by a compilation of statistics on the activities of the institution for the year.

The number of visitors received in the Museum building was 1,824,202, which was a new high record for attendance. In addition, activities of the institution conducted outside the walls of its building reached nearly 700,000 children. Of the beneficiaries of the extra-mural activities, 181,672 were children who heard, in their school classrooms and assemblies, natural history lessons presented by lecturers of the James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures. This is only one part of the Raymond Foundation's work—the total number reached by all of the Foundation's activities, including those both inside and outside the Museum, was 251,119. More than 500,000 children were reached at intervals of two weeks during the school year by traveling natural history exhibits circulated in all the public and many other schools by the Department of the N. W. Harris Public School Extension.

The gain in the number of visitors to the Museum, as compared with the 1931 figure, was 308,662. While the total attendance has been increasing so steadily during the past few years, there has been a striking reduction in the number of paid admissions, apparently as a result of the depression. The number of paid admissions dropped from 160,924 in 1930 to 126,209 in 1931, and in 1932 there was a further decrease to 82,607. It will thus be seen that last year barely 4½ per cent of those visiting the Museum paid admission. The 1932 attendance on free days, plus the free admissions on pay days granted to Members, children, teachers, students, etc., amounted to 1,741,595, or 226,055 more than the total of free and paid admissions together in 1931, which was 1,515,540. This may be accepted as evidence that the Museum, in addition to its normal functions, is performing a special service during "hard times" by providing something of interest for those no longer able to afford other forms of recreation.

BRONZES OF ORIENTALS

(Continued from page 1)

taken, together with a model she made of a male Ainu head, have enabled her to make a full-length statue of an Ainu. As these people are extremely shy, and object strongly to being photographed or exposing their bodies to a foreigner, this is indeed an achievement of importance.

In Peiping Miss Hoffman enjoyed the hospitality of the Peking Union Medical College and the active cooperation of Dr. Davidson Black, Professor of Anatomy. There she modeled life-size heads of a northern Chinese and a Manchu, and the head of Dr. Hu Shi, famous Chinese scholar.

Among the numerous tribes inhabiting the Malay archipelago the artist selected for life-size portrait-heads a dancing girl from Bali, a typical boy and girl from Java, a Jakun (proto-Malay), a Sakai and Semang (pygmies of tribes living in the densest jungle of the Malay Peninsula), a Dyak from Borneo, and a pure Malay. In order to track down the Jakun and Sakai, hundreds of miles had to be traversed by motor car into the jungles, and the work had to be done under the most primitive and difficult conditions. Life-size drawings were made of a youth from Bali, and a pure-blooded Papuan from British New Guinea.

Several weeks of traveling in India included sojourns in Calcutta, Delhi, Jaipur, and Colombo. The principal accomplishment was the modeling of a strong Kashmiri with a fine head. In Calcutta Miss Hoffman was fortunate enough to meet a Tibetan couple, traders in jewels, from Lhasa. Both husband and wife were modeled. Also modeled were the heads of a Brahman from Benares, a high-caste Brahman woman from Bengal, and an Indo-Afghan from Kabul.

In addition to heads and life-size figures, the artist made numerous casts in negocoll of hands and feet of natives in characteristic poses; among others, the hand of a native of India in the act of taking his food, and the hand of an Indian artist wielding his paint brush. As the manner of using the hand is very different among Orientals as compared with Occidental peoples, these casts are of great scientific value. Life-size drawings were made of a Burmese from Rangoon and a Tamil from Madras.

WATER BIRDS EXHIBITED

By Rudyerd Boulton
Assistant Curator of Birds

Certain birds well known to many people by name, although most of them are rarely seen in inland localities, recently were placed on exhibition in Hall 21. They constitute the four most primitive orders found in North America, and are noteworthy for curious form and structure rather than for bright and attractive colors.

Five loons shown are so truly aquatic they are unable to walk upright on land. Their feet are webbed like those of ducks. Seven grebes in the exhibit also are more at home in water than on land. Their feet are not webbed, but each toe is provided with a fringing flap of skin which forms an excellent paddle. Grebes build floating nests in marshy lakes, and rarely, if ever, voluntarily come to dry land.

Albatrosses, shearwaters, fulmars and petrels represent the large group of sea-birds known as "tube-nosed swimmers" because their nostrils open into little tubes on the upper surface of the bill. Their feet are webbed, but they spend a large part of their time flying over the high seas and come to land only to nest and raise their young. The small petrel often called "Mother Carey's chicken" is shown in characteristic flying attitude.

The fourth large group of birds in the exhibit contains the "totipalmate swimmers," so-called because their feet are completely webbed, all four toes being joined by a web of skin. The man-'o-war bird, tropic-bird, snake-bird, pelicans, boobies and cormorants all show their relationship through this characteristic. Although cormorants have dark plumage, they are decorated by the brilliant coloring of the bare skin of the face and throat pouches during the breeding season.

The specimens were prepared by Taxidermist Ashley Hine of the Museum staff.

Mrs. Edward E. Ayer is Dead

Mrs. Edward E. Ayer, an Honorary Member of Field Museum, and one of its Contributors, died on December 18 at her home in Chicago. She was the widow of Edward E. Ayer, first President of the Museum, and a Trustee from the time of the institution's establishment until his death in 1927. Mrs. Ayer shared her husband's enthusiasm for and interest in the Museum.

SIR HUBERT WILKINS, EXPLORER, TO LECTURE AT MUSEUM

Captain Sir Hubert Wilkins, famed explorer of the Arctic and Antarctic, will lecture at Field Museum on Saturday afternoon, March 4. His subject will be "What I Have Discovered in the Arctic and Antarctic," and he will relate his experiences on expeditions made by dog team, by airplane, and by submarine. The lecture will be illustrated with motion pictures. It will be given in the James Simpson Theatre of the Museum, and will begin at 3 P.M.

Sir Hubert's lecture is the first in the fifty-ninth course presented by the Museum, which will comprise eight other lectures to be given on successive Saturdays throughout March and April. The complete schedule for this course will appear in the March issue of FIELD MUSEUM NEWS.

No tickets are necessary for admission to these lectures. A section of the Theatre is reserved for Members of the Museum, each of whom is entitled to two reserved seats on request. Requests for these seats may be made by telephone or in writing to the Museum, in advance of the lecture, and seats will then be held in the Member's name until 3 o'clock on the day of the lecture. Members may obtain seats in the reserved section also by presentation of their *membership cards* to the Theatre attendant before 3 o'clock on the lecture day, even though no advance reservation has been made. All reserved seats not claimed by 3 o'clock will be opened to the general public.

NEW WORLD FOOD PLANTS

By B. E. DAHLGREN
Acting Curator, Department of Botany

The Department of Botany recently installed in Hall 25 an exhibit showing the principal food plants of American origin.

On his first voyage to the New World, Columbus found the inhabitants using vegetables that were strange to him, especially some starchy tubers, probably sweet potatoes and cassava. He carried these back to Spain and presented them to Queen Isabella, together with other products of the newly found land. It is doubtful whether the queen was greatly impressed with the present. She would much rather have had a gift of cinnamon, cardamoms or sandalwood, which would have constituted proof of a new route to India. The incident, however, is noteworthy as marking the first introduction of American food plants into the Old World, an event of considerable significance to the world's dietary, which has America to thank for many important contributions.

It is interesting to note that the introduction of Old World food plants into America also dates from the voyages of Columbus, and has continued ever since.

After Columbus, the early explorers and conquistadores found other food plants in use and in cultivation among the New World inhabitants, especially the Aztecs of Mexico and the Incas of Peru. Cortez made the first acquaintance with chocolate and vanilla at the court of Montezuma. It is evident that the areas inhabited by the Mayas and Incas have been important centers of origin and dispersal of plants.

The settlers in North and South America soon learned to use many of the vegetable foods of the Indians, such as corn, beans, pumpkins and cassava. Certain of the newly discovered food plants spread rapidly over most of the world. This was true of the peanut, which was carried to Africa from the east coast of South America and to the Orient from the west coast, early in the history of world-wide navigation. Some American food plants, such as potatoes, were first carried to Europe and developed in cultivation there before coming into general use among the new population in the land of their origin. Others, such as tomatoes, were very slow in becoming adopted. The tomato was grown in Europe for several centuries as a curiosity and ornamental plant before it became, rather recently, the important article of food that it is today. A few valuable American food plants such as the avocado are only now becoming well known. Others, e.g., the chayote, are scarcely known at all in the United States in spite of efforts made to introduce them.

The recent discovery by a party of Russian botanists of more than a dozen potato-like plants and potato relatives cultivated by Indians, a few in the Maya area in southern Mexico, the rest in Bolivia on the margin of the former Inca region, may prove to be of importance for the development of new and improved sources of food at the hands of expert plant breeders.

The new exhibit shows only the principal native American vegetable products. Many tropical American fruits and some vegetables, little known in North America, are omitted. Also omitted are various small fruits such as strawberries, raspberries, blueberries, and plums, which belong to the circumpolar flora and have their counterparts in Europe. The display includes maize, or Indian corn, potatoes, sweet potatoes, tomatoes, pimentoes, Jerusalem artichokes, which are the roots of a western sunflower, pumpkins, squashes, lima and kidney beans, cassava, which in the United States is best known in the form of tapioca, peanuts, cranberries, persimmons, papaws, papayas, the avocado, the pineapple, cacao, vanilla, and others.

Chinese Mirrors Displayed

Two exhibition cases of metal mirrors from China, some dating back as far as 246 B.C., have been installed in George T. and Frances Gaylord Smith Hall (Hall 24).

Mirrors were important to the Chinese not only as aids to vanity, but also because of the belief that they dispelled evil spirits and goblins, according to Dr. Berthold Laufer, Curator of Anthropology. The common superstition that breaking a mirror brings bad luck prevails in China, and goes far back into antiquity, states Dr. Laufer.

Progress of Rockefeller Project

J. Francis Macbride, Assistant Curator of Taxonomy, in Europe for several years to obtain photographs of type specimens of Central and South American plants in European herbaria—a joint project of the Rockefeller Foundation and Field Museum carried on for the benefit of botanists generally—reports that he has completed 2,000 photographs at the University Museum of Copenhagen, and is continuing similar activity at Geneva. To date more than 23,000 photographs have been assembled in various European herbaria. The herbarium of Copenhagen contains some early and important Central American collections, especially from Costa Rica, and its curator, Dr. Carl Christensen, generously permitted Mr. Macbride to select a large amount of duplicate material for the herbarium of Field Museum.

A DEFENDER OF THE FAITH AND HIS MIRACLES

By BERTHOLD LAUFER
Curator, Department of Anthropology

An exhibit of carved wooden images of Buddhist and Taoist deities was recently installed in George T. and Frances Gaylord Smith Hall (Hall 24). Most of these were obtained from ancient temples in and around Si-an fu. One of them is a statue of Wei-to, the loyal protector of Buddha's temples and a staunch defender of his faith.

This statue, well carved and finely lacquered, is glorified by a tradition. During the seventh century there lived at Si-an fu a Buddhist priest, Tao Süan by name. Like all monks he was devoted to contemplation, looked upon as the means of attaining self-perfection. Meditation naturally led to dreams, in which he had contact with the supernatural. Tao Süan wrote his memoirs, in which he records his conversations with the gods. Among others Wei-to appeared and ordered his statue made exactly like his apparition. Tao Süan obeyed, and thenceforward images of Wei-to were set up as the guardians of Buddha's temples and clergy.

All other Buddhistic divinities are derived from types created in India, where Buddhism was born. Wei-to is the only one conceived in China. He has the appearance of a handsome Chinese youth with a smiling countenance, yet is a powerful general fortified by a suit of mail, ever ready to strike demons and foes of the faith.

The temple from which came the Wei-to now in the Museum was erected on the spot where Tao Süan lived and taught. According to tradition this statue was a descendant of Tao Süan's work, permeated by his spirit. It was regarded, therefore, as a great miracle-worker. Wei-to, above all, was a good provider, an efficient money-raiser, and bill collector. In some monasteries the monks placed his statue in the kitchen, entrusting its supervision to his care. Sometimes they even recited incantations, threatening him with corporal punishment if he should neglect to supply them with provisions.

Whenever a temple was in need of repairs, or a pagoda was to be restored, Wei-to was instrumental in raising the necessary cash. The brotherhood would stage a procession through the city. One monk, carrying a shrine harboring Wei-to's picture, and beating a wooden drum in the shape of a fish, solicited funds from the wealthy. If this was unsuccessful, a monk would deposit Wei-to's image on the threshold of the house of a prominent family, obstruct the entrance, and remain seated there cross-legged like a Buddha, for days if necessary, until the contribution was made.

If the monks again failed in this quest of charity, they resorted to extreme measures. One would be locked in a cage just high enough to allow him to squeeze in, and would then be exhibited in the market place. The door of the cage was padlocked, and the news was broadcast that he was doomed to die of starvation unless the money was raised. The people were urged to have pity. To arouse their feelings, it was said that the prisoner's bare feet rested on iron spikes. This in a way was true, but the spikes were so deeply sunk into a plank that it formed a smooth surface. Moreover, the man was always secretly released before harm could befall him.

It will thus be seen that "rackets" are not of recent origin, but that they have a history whose threads may take us back to the intricate mysteries of the Orient.

RAYMOND FOUNDATION PRESENTS PROGRAMS FOR CHILDREN

Two special programs of free motion pictures for children, in celebration of the birthdays of Abraham Lincoln and George Washington, will be given at the Museum during February by the James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures. Following these, the Raymond Foundation will present the first of its regular spring series of ten children's entertainments.

The Lincoln program will be given on Saturday morning, February 11, and will consist of films dealing with outstanding events in the life of the Civil War president. The Washington program, made up of films dealing similarly with the life of the nation's first great hero, will be presented on Wednesday morning, February 22.

The regular spring series will begin on Saturday morning, February 25, with a program of three motion pictures, as follows: "The Muskrat and the Fox," "The Forest Ranger and His Work," and "Behind the Weather Man." The second program in this series, to be given Saturday, March 4, includes the films, "A Beaver and His Indian Friend," and "The Declaration of Independence."

The other eight programs in the spring series will be announced in the March issue of FIELD MUSEUM NEWS.

In order to accommodate larger numbers of children, all the programs of the Raymond Foundation, both special and regular, are presented twice, the first showing of the films beginning at 10 A.M., and the second at 11 A.M. They are given in the James Simpson Theatre of the Museum. Children from all parts of Chicago and suburbs are invited to attend.

ELECTION OF MUSEUM OFFICERS

The Annual Meeting of the Board of Trustees of Field Museum was held January 16. President Stanley Field was re-elected for the twenty-fifth time. Mr. Field has been President continuously since January, 1909.

Second Vice-President Albert A. Sprague was elected First Vice-President, filling the vacancy in that office caused by the death last August of Martin A. Ryerson. Third Vice-President James Simpson was elected Second Vice-President, and Trustee Albert W. Harris was elected Third Vice-President. Stephen C. Simms, Director and Secretary, and Solomon A. Smith, Treasurer and Assistant Secretary, were re-elected to their respective offices.

THE BONEFISH

BY ALFRED C. WEED
Assistant Curator of Fishes

Among the fishes of the Florida coast, three stand out as popular game species. These are the tarpon, sailfish, and bonefish. The first two have the advantage of large size in their battles with fishermen. The bonefish is smaller, seldom weighing more than twenty pounds. Its claim to excellence for the sport angler comes from strength, speed and leaping ability. Shaped like a long, slender spindle, stream-lined in every part, and able to close most of its fins down into grooves so that they offer no resistance, this fish develops and maintains great speed for a long rush.

The bonefish does not depend on straight rushes alone to escape from the hook. Much of its fight consists of leaps above the surface. Dr. J. A. Henshall, noted authority on game fishes, described it as a "silver shuttle," flashing in and out of the water in a succession of swift jumps.

Some excellent specimens of bonefish were recently presented to Field Museum by Colonel Lewis S. Thompson of Red Bank, New Jersey. One of them, mounted by Staff Taxidermist L. L. Pray, is on exhibition in Albert W. Harris Hall (Hall 18). Mr. Pray has observed bonefish in their natural surroundings near Nassau, Bahama Islands. He says they appear as gray shadows when resting or moving slowly through the water. When startled, they become gray streaks that disappear almost instantly. When taken out of the water, the gray appearance changes instantly to a burnished silver color.

There has long been a dispute about the name of this fish. As early as 1888, Dr. G. Brown Goode mentioned that this species (*Albula vulpes*) was called ladyfish in Bermuda but that American writers called it bonefish. Since that time most scientists have used the name ladyfish, and have used the name bonefish for a small relative of the tarpon, which is also sometimes called big-eyed herring (*Elops saurus*). However, most American anglers have used the name bonefish for *Albula* and have called *Elops* something else. In Australia, where *Elops* grows to a length of four feet or more, it is called "giant herring," while the name big-eyed herring is given to the East Indian tarpon, *Megalops cyprinoides*. In cases of such a difference of opinion, it seems best to use, as far as possible, the names used by those who know the fish by handling it and not by simply writing about it.

EXHIBIT OF ORIENTAL WOOD

A recent addition to the series of Australian woods in Hall 27 is a group of four panels of the so-called Oriental wood (*Endiandra Palmerstoni*), a gift of Russell Fortune, Inc., Indianapolis.

This useful wood comes from a tree which often attains a height of 140 feet or more. It grows in northern Queensland. Although it belongs to the laurel family it is known in its native country as black walnut, Medang walnut, walnut bean and black mahogany. During recent years Oriental wood has been introduced commercially into the United States.

Quarter-sawed panels of this wood have a figure consisting of more or less parallel stripes of varying width, often interrupted by cross-figures of different types. Individual specimens show a variety of colors ranging between salmon red and a walnut tint, or from gray to brown. Its decorative qualities make the wood suitable for the manufacture of furniture, cabinets, fixtures and fittings. In Australia it is used in making pianos.

Laterite Added to Soil Exhibit

A specimen of laterite was recently added to the soil collections in Hall 36, to call attention to this curious infertile substance which sometimes takes the place of soil in tropical and subtropical regions. It is occasionally found as far north as the southern borders of this country. Laterite, like soil, is a product of the disintegration of solid rock, but under special conditions of temperature and moisture the decomposition is of a different character and little of the original rock remains except oxides of iron and aluminum. These form stony, porous or granular masses free from the clay upon which the fertility of ordinary soil largely depends.

FEBRUARY GUIDE-LECTURE TOURS

Conducted tours of exhibits, under the guidance of staff lecturers, are made every afternoon at 3 P.M., except Saturdays, Sundays, and certain holidays. Following is the schedule of subjects and dates for February:

Wednesday, February 1—Reptiles, Past and Present; Thursday—General Tour; Friday—Roman Hall.

Week beginning February 6: Monday—Marine Life; Tuesday—Eskimo Customs; Wednesday—Animal Life in the Chicago Area; Thursday—General Tour; Friday—Weaving in Many Lands.

Week beginning February 13: Monday—Egyptian Exhibits; Tuesday—Mexico; Wednesday—Woodland Indians; Thursday—General Tour; Friday—Pewter, Jade and Gems.

Week beginning February 20: Monday—Plants of Unusual Interest; Tuesday—Chinese Halls; Wednesday—Prehistoric Plants and Animals; Thursday—General Tour; Friday—Moon and Meteorites.

Monday, February 27—Baskets and Mats; Tuesday—Man Through the Ages.

Persons wishing to participate should apply at North Entrance. Tours are free and no gratuities are to be proffered. A new schedule will appear each month in FIELD MUSEUM NEWS. Guide-lecturers' services for special tours by parties of ten or more are available free of charge by arrangement with the Director a week in advance.

Gifts to the Museum

Following is a list of some of the principal gifts received during the last month:

From University of Texas—160 herbarium specimens, Texas and New Mexico; from Museo Nacional (Costa Rica)—68 herbarium specimens, Costa Rica; from Companhia Ford Industrial do Brasil—42 herbarium specimens and accompanying wood specimens, Brazil; from Rev. Brother Elias—85 herbarium specimens, Colombia; from C. C. Deam—87 herbarium specimens, Indiana; from School of Forestry, Yale University—97 herbarium specimens, Colombia; from Arturo Burkart—36 herbarium specimens, Argentina; from United States National Museum—cast of the Santa Fe meteorite; from Le Roy P. Guion—etched section of Seneca Falls iron meteorite; from Mrs. J. T. Stewart—11 clay concretions, Colorado; from Bryan Patterson, Frank Letl, and Thomas J. Newbill, Jr.—48 specimens of invertebrate fossils, Illinois; from Sharat K. Roy and Bryan Patterson—20 specimens of fossil brachiopods, 2 of fossil cephalopods, and one of a fossil bryozoan, Wisconsin; from Mr. and Mrs. J. R. Below, Miss Nan Mason, and Bryan Patterson—24 specimens of invertebrate fossils, Illinois; from Oriental Library (Toyo Bunko), Tokyo—photostat reproduction of painting by Shizuya Fujikake, depicting the Mongol invasions of Japan in 1274 and 1281.

NEW MEMBERS

The following persons were elected to membership in Field Museum during the period from December 16 to January 16:

Associate Members

Joseph A. Duner, Edwin S. Fetcher, Professor James Payne, Louis C. Seaverns, Mrs. Robert E. Wilson.

Non-Resident Associate Members

Mrs. Winfield S. Day

Annual Members

Mrs. W. Gray Brown, Mrs. Howard J. Burridge, Mrs. John Porter Denison, Graham B. Jacobus, Mrs. Alexander M. Kerr, Mrs. John J. Louis, James E. McShane, Mrs. Philip Raymond O'Brien, Conway H. Olmsted, Mrs. L. B. Patterson, Miss Luella Raithel, Mrs. A. W. Shaw, J. C. Slaney, Harry Snyder, Mrs. L. S. Tark, James Webster, Leon Witkowsky.

A Historic Plant Collection

A most unusual collection of 280 sheets of plants of the Rubiaceae or coffee family was received recently for determination at Field Museum from the United States National Museum. It was part of a large series of specimens obtained at the Botanic Garden of Madrid, which possesses probably the first collections of plants ever made in tropical America by pioneer Spanish botanists. This collection was made between 1760 and 1808.

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EXHIBIT REVEALS INFLATION ATTEMPT BY ANCIENTS

The evolution of money in China, from implements used for barter down to coins, is illustrated in a new exhibit in George T. and Frances Gaylord Smith Hall (Hall 24). How attempts were made to inflate the currency thousands of years ago, and how the people resisted, is told by Dr. Berthold Laufer, Curator of Anthropology. In the exhibit is a coin with an inscription which indicates an inflated value, many times the actual value in smaller coins. When such inflated currency was circulated, the Chinese people refused to accept it at face value, and used it merely at the actual value represented by the metal in the coin, Dr. Laufer says. As a result all inflation attempts failed, and several emperors were forced into bankruptcy.

Included in the same exhibit are collections of ancient Chinese public and private seals, and the world's earliest chessmen, made of bronze and dating back to the ninth century. There are also shown charms derived from coin designs, and rare old coins worn as charms to protect the wearer against demons, lightning, snake bites, and other dangers, and to bring luck, wealth, long life, and numerous descendants.

The currency exhibit begins with small bronze or copper bells, axes, spades, and knives which served as media of exchange in earliest times. These gradually assumed conventionalized forms, and finally became flat, thin and convenient for circulation. From these developed coins. The earliest circular coins, with round or square holes in their centers, are shown.

The earliest of the seals are of clay, the later ones of metal. Some, in addition to the owner's name, are provided with his thumb impression and thumbnail mark, and Dr. Laufer states that the Chinese were the first people to recognize the value of fingerprints in identification.

An exhibit of mediaeval cast iron objects from China, ranging in date from A.D. 618 to 1643, has also been installed in the same hall. A wide variety of objects is shown, including temple bells, Buddhistic and Taoistic figures, utensils, ornamental objects, and iron coins.

"During the Sung dynasty (A.D. 960–1279) scarcity of copper forced the government to resort to iron currency which was circulated

(*Continued on page 2*)

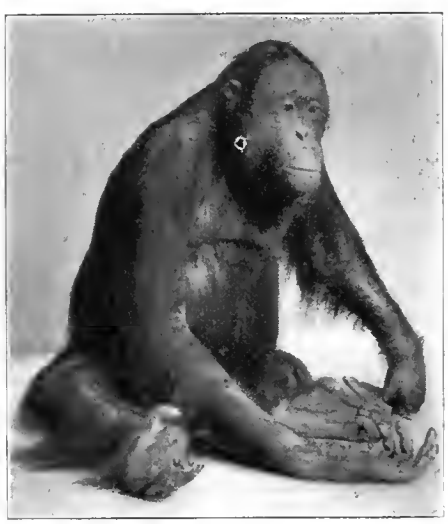
NEW TAXIDERMY METHOD APPLIED TO ORANG

By Wilfred H. Osgood
Curator, Department of Zoology

Because it is one of the anthropoids or man-like apes, an orang is always interesting, but an especially prepared specimen placed on exhibition last month is extremely unusual. This orang is partly real and partly synthetic, and represents the first serious attempt to apply the so-called "celluloid" process to hairy mammals.

This process, developed by Leon L. Walters of the Museum's taxidermy staff, has reached a high degree of perfection for the reproduction of naked and scaly animals such as amphibians and reptiles. It has also proved successful for the hippopotamus and the rhinoceros, and its potential advantages for preparing exhibits of animals which are mainly hairy but with the skin exposed on certain parts have been evident for some time past.

The recent receipt of an orang in fresh condition, shortly after its death, offered an opportunity for applying the process which was eagerly seized by Mr. Walters, and the result is a specimen exceedingly life-like in appearance and quite unique among museum preparations. The dead animal was posed in a carefully chosen attitude based on studies of living orangs and molds were then taken from it, reproducing its form with utmost precision. By means of a special technique, the hair of the original animal was transferred to the reproduction, becoming embedded in the celluloid-like composition exactly as it was formerly in the skin. In effect, the skin was replaced by the composition and in the resulting specimen the only part not artificial is the hair.



New Orang Exhibit

This ape, now to be seen in Hall 15, represents the first application of the Walters cellulose-acetate process of reproduction to a hairy mammal.

The advantages of a reproduction of this kind are mainly in the increased fidelity to nature which is possible, especially in the fine detail of the surface of the skin and in its coloration, translucence and texture. Like other works of taxidermy, it is a combination of art and realism, but while its art does not necessarily suffer, its realism is less limited than by methods in which the dried and tanned skin is used. It does not threaten to displace earlier methods, however, except for subjects to which it is peculiarly adapted.

The orang reproduction is exhibited in Hall 15 in a case with the gorilla, chimpanzee, and gibbons in the systematic series of mammals.

LIFE BEYOND EARTH INDICATED BY METEORITIC BACTERIA?

By Oliver C. Farrington
Curator, Department of Geology

Is there life beyond the earth? The problem of whether life exists in other parts of the universe is one which probably will always be of interest to the human race. Aside from possibilities of "exchanging signals with Mars," probably the only physical source of evidence to which we can look for an answer is in those celestial rocks called meteorites. These missiles from outer space arriving on the earth have been examined for many years to see what light, if any, they would throw on the question. Until recently the only indication they have given that life might exist in the regions whence they came is the fact that hydro-carbons, similar to those which on this earth are of organic origin, have been detected in some meteorites. These compounds suggest that there may be plant or animal life outside of the earth, but no positive evidence in the form of observations of microscopic cell structure or other distinguishing features has ever been obtained from a study of them.

Recently a new suggestion that life exists elsewhere than on the earth arises from the work on meteorites of Dean Charles B. Lipman of the University of California. Dean Lipman's investigations, the results of which have just been published, seem to indicate that bacteria are sometimes to be found in the interior of stone meteorites, also known as aërolites. From these they may be extracted and their growth and multiplication carried on under terrestrial conditions.

Discovery of these bacteria also opens further speculation on the theory some scientists have propounded to the effect that the original forms of terrestrial life may have been brought to the earth by meteorites hundreds of millions of years ago.

Professor Lipman's experiments began several years ago when he found evidence of the existence of bacteria in ancient terrestrial rocks and in coal. Turning his attention to the possibility of finding them also in meteorites, he applied to several museums having large collections (among them Field Museum) for a supply of suitable material for an investigation. Especially desired were small individual meteorites, the interior of which had been completely sealed by the crust which formed on the surface during the journey through the earth's atmosphere. This crust presumably would insure retaining the contents of the interior in their original form and condition. Field Museum responded to this request by furnishing individuals of the Pultusk, Poland, meteorites which fell in 1868, of the Mocs, Hungary, meteorites which fell in 1882, and of the Richardton, North Dakota, meteorites which fell in 1918. Other museums cooperating were the American Museum of Natural History, of New York, United States National Museum, Washington, D.C., and the

(*Continued on page 2*)

Field Museum of Natural History

Founded by Marshall Field, 1893

Roosevelt Road and Lake Michigan, Chicago

Field Museum is open every day of the year during the hours indicated below:

November, December, January	9 A.M. to 4:30 P.M.
February, March, April, October	9 A.M. to 5:00 P.M.
May, June, July, August, September	9 A.M. to 6:00 P.M.

Admission is free to Members on all days. Other adults are admitted free on Thursdays, Saturdays and Sundays; non-members pay 25 cents on other days. Children are admitted free on all days. Students and faculty members of educational institutions are admitted free any day upon presentation of credentials.

The Museum's natural history Library is open for reference daily except Saturday afternoon and Sunday.

Traveling exhibits are circulated in the schools of Chicago by the N. W. Harris Public School Extension Department of the Museum.

Lectures for schools, and special entertainments and tours for children at the Museum, are provided by the James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures.

Announcements of free illustrated lectures for the public, and special lectures for Members of the Museum, will appear in Field Museum News.

A cafeteria in the Museum serves visitors. Rooms are provided for those bringing their lunches.

Chicago Motor Coach Company No. 26 buses go direct to the Museum.

Members are requested to inform the Museum promptly of changes of address.

MEMBERSHIP IN FIELD MUSEUM

Field Museum has several classes of Members. Benefactors give or devise $100,000 or more. Contributors give or devise $1,000 to $100,000. Life Members give $500; Non-Resident (Life) and Associate Members pay $100; Non-Resident Associate Members pay $50. All the above classes are exempt from dues. Sustaining Members contribute $25 annually. After six years they become Associate Members. Annual Members contribute $10 annually. Other memberships are Corporate, Honorary, Patron, and Corresponding, additions under these classifications being made by special action of the Board of Trustees.

Each Member, in all classes, is entitled to free admission to the Museum for himself, his family and house guests, and to two reserved seats for Museum lectures provided for Members. Subscription to Field Museum News is included with all memberships. The courtesies of every museum of note in the United States and Canada are extended to all Members of Field Museum. A Member may give his personal card to non-residents of Chicago, upon presentation of which they will be admitted to the Museum without charge. Further information about membershipa will be sent on request.

BEQUESTS AND ENDOWMENTS

Bequests to Field Museum of Natural History may be made in securities, money, books or collections. They may, if desired, take the form of a memorial to a person or cause, named by the giver.

Cash contributions made within the taxable year not exceeding 15 per cent of the taxpayer's net income are allowable as deductions in computing net income under Article 251 of Regulation 69 relating to the income tax under the Revenue Act of 1926.

Endowments may be made to the Museum with the provision that an annuity be paid to the patron for life. These annuities are tax-free and are guaranteed against fluctuation in amount.

LIFE BEYOND EARTH?

(Continued from page 1)

Colorado Museum of Natural History, Denver.

Professor Lipman's method of investigation consisted of first thoroughly sterilizing the exterior of each meteorite by scrubbing it with soap and water, then soaking it in a 30 per cent hydrogen peroxide solution, then in alcohol, and then heating it in a flame for thirty seconds. The meteorites were then placed in a variety of sterile culture media and allowed to remain from two weeks to five months. Under these conditions if any organisms had remained alive on the surface, growths would appear. In most cases no such growth occurred. Specimens which thus showed sterile surfaces were then transferred under sterile conditions to a sterile mortar in which they were ground to powder. Portions of the powder were distributed into various culture media and watched for whatever growths might develop.

Both the Mocs and Pultusk meteorites supplied by Field Museum yielded notable colonies of bacteria. These were mostly of the order of rod or bacillus forms, and cocci, but from one culture from the Pultusk meteorite there was produced a very remarkable organism. This organism proved to be autotrophic, that is, one which builds carbohydrates and protein from carbon dioxide and inorganic salts. As these are common constituents of meteorites, such organisms might be able to perpetuate themselves for a long period.

Many of the other forms found in the meteorites were spore-forming organisms. The preservation of spores in a dormant condition during a long period might have been possible. How long such spores might retain vitality is not known, but one case of germination after forty years is known, and in the view of Dean Lipman there is no reason to doubt a possible retention of their vitality for a period of many times that length. Many other bacteria obtained from the meteorites were coccus forms which are not believed to be spore formers, but in Professor Lipman's opinion they may have produced bodies which served the purpose of spores.

Studies which have been made on the age of the materials composing meteorites indicate that they are of the same general order in this respect as the solar system. The age of one stone meteorite has been calculated from its helium content to be 110,000,000 years. Under what conditions, or at what period, if any, during that time the growth of bacteria might take place in a meteorite, there is at present no means of determining. Naturally far more investigation is necessary before satisfactory conclusions can be drawn.

In order to determine what sources of food for bacteria might be found in meteorites, beyond those already mentioned, Professor Lipman also made some investigations to learn whether organic nitrogen was present. The result showed a small percentage of organic nitrogen actually present in all of seven stony meteorites which were examined. The existence of organic nitrogen in meteorites had not been previously known.

A specimen of the giant salamander of Japan, which grows to about fifty pounds in weight and five feet in length, is exhibited in Albert W. Harris Hall.

Ancient Inflation Attempt

(Continued from page 1)

in large quantities, without, however, superseding the existing copper money," says Dr. Laufer. "The legal ratio made ten iron pieces the equivalent of one copper coin. This double standard naturally caused difficulties and the relative value of the two metals was subject to many fluctuations."

The casting of iron, Dr. Laufer states, is an art practised through all periods of Chinese history. In early times the Chinese dedicated cast iron to the service of the dead, as a precious and durable substance worthy of being offered to ancestors.

GLOBES SHOW ABUNDANCE OF CERTAIN ELEMENTS

Graphic illustration of the quantities existing in the crust of the earth of certain elements is afforded by small globes which are being added to some of the exhibits in the Department of Geology. So far, such globes, with maps of the continents outlined on them, have been installed with the aluminum, iron and silicon exhibits.

Aluminum is the most abundant of all metals. This is shown graphically on a sphere three inches in diameter by a circle, painted in aluminum color, 1.6 inches in diameter, which represents the space that would be occupied by all the aluminum in the crust of the earth if it were gathered into one place. On another globe of the same size the iron of the earth's crust is similarly represented, by a circle 1.27 inches in diameter. These proportions include not only the ores of sufficiently high grade for mining, but all other aluminum and iron deposits, it is explained by Henry W. Nichols, Associate Curator of Geology. On the other hand, it is emphasized that only the *crust* of the earth to a depth of ten miles, which is the farthest point accessible, is considered. There is reason to believe that the inaccessible interior of the earth contains vastly larger quantities, probably as much as two-thirds of the entire substance of the earth being iron.

On the globe devoted to silicon, the space occupied by the circle is 2.6 inches in diameter. This non-metallic substance is second only to oxygen in abundance as an ingredient of the earth's crust.

Museum Aids Rotenone Research

Recently in the *Journal of the Washington Academy of Sciences*, Howard A. Jones, of the Bureau of Chemistry, United States Department of Agriculture, published the results of experiments in the extraction of rotenone from derris and cube bark, mentioning particularly Peruvian cube from Field Museum.

Rotenone is a chemical compound prominent as an ingredient of insecticides. Mr. Jones finds cube much richer in rotenone than Old World derris bark. The cultivation of cube (*Lonchocarpus nicou;* a vine of the bean family), promises to become an industry of importance. The Field Museum material was obtained by Llewelyn Williams, Assistant in Wood Technology, while a member of the Marshall Field Botanical Expedition to Peru (1929).

An interesting habitat group of beavers may be seen in Hall 16.

An ingenious cradle for a baby, and a fox-skin swaddling, used by the Karok Indians of California, are displayed in Hall 6.

RAYMOND FOUNDATION PRESENTS PROGRAMS FOR CHILDREN

There remain nine more free motion picture programs for children to be presented at the Museum in the annual spring series of the James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures. These will be given on Saturday mornings during March and April. Following is the schedule of dates, and the titles of the films to be shown on each:

March 4—A Beaver and His Indian Friend; The Declaration of Independence

March 11—Fathoms Deep; Queen of the Waves; Cotton—From Seed to Cloth

March 18—The Coyote Family; From Tree to Newspaper

March 25—Porcupines, Bears and Badgers; Buried Sunshine

April 1—The Tortoise and His Cousins; The Frontier Woman

April 8—The Rhino Meets an Automobile; A Dyak Wedding; A Trip Through Yellowstone Park

April 15—The Realm of the Honeybee; Among the Elephant Seals

April 22—A Trip to Penguin-land; Peter Stuyvesant

April 29—From Egg to Butterfly; Flower Friends of Brook and Roadside; Wild Wings

Each program is given twice, at 10 A.M. and at 11, in the James Simpson Theatre of the Museum. Children from all parts of Chicago and suburbs are invited to attend. No tickets are required for admission.

Herpetologist Schmidt Returns

Karl P. Schmidt, Assistant Curator of Reptiles, has returned to Field Museum after six months of research at European museums, carried on under a grant from the John Simon Guggenheim Memorial Foundation of New York. Studies long in hand on the Central American reptilian fauna were concluded by examination of type specimens in these museums. These studies are a part of the program of investigation of the reptiles and amphibians of Central America begun in 1923 with Field Museum's expedition to British Honduras and Honduras.

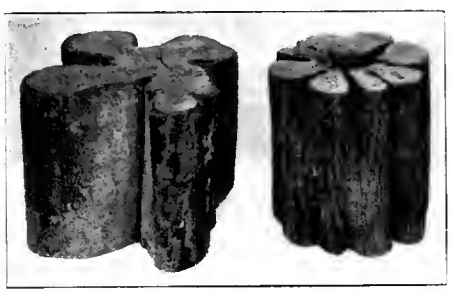
REMARKABLE AMAZON WOODS RECEIVED AT MUSEUM

By B. E. Dahlgren
Acting Curator, Department of Botany

At times an aromatic haze spreads through the offices and workshops of the Museum, and is perceptible even in the exhibition halls. Traced to its source it will be found to emanate from the quarters of the Department of Botany, where it is apt to take the form of a blue smoke, becoming denser as one approaches the Department's carpenter shop, where it originates.

This phenomenon, which recurs periodically, marks the arrival in the Museum of a new sending of Amazonian woods from the Ford Motor Company's concession on the Tapajos River in Brazil. Many of these woods are so hard that it is difficult to cut them into hand specimens with the power-driven band saw. Others are hard and at the same time resinous or gummy. On cutting them, even with the greatest care, the rapidly running band saw becomes heated and scorches the gum or volatilizes the resin contained in the wood. The result is a dense fog, sometimes veritable clouds of smoke, which may be pungent almost to suffocation or, almost as often, pleasantly aromatic, spreading like incense through the building. Certain of the woods are, in fact, well-known sources of incense gums.

Their resistance to cutting instruments is not always due solely to density of structure. Some are known to contain fine particles of silica, capable of dulling the best of saws in a few moments. Such woods are immune to insect attacks and even resistant to the rasping action of the tongue of the toredo or shipworm. Some have their bundles of woody fibers twisted and interlaced so effectively that, though they may be sawed, they can scarcely be split with an ax. Others are remarkable for their color which may become more intense, or may disappear, on exposure to light. Many are interesting for their grain—all for their minute structure, and the size and disposition of their



Sections of Odd Tree Trunks

Two Amazonian woods of strange contour. In the one on the left the ace of clubs outline indicates a buttressed base. In the other the wood forms bundles enveloped by bark as in some lianas. Both are of the Indian hemp family.

vessels, which distinguish one genus of trees from another.

By no means all of these tropical woods are either heavy or difficult to work. Some are of moderate weight and may be cut and shaped with facility. Many take a beautiful finish. A considerable part of them must be classed as soft woods although there are no conifers among them. A few, like the well-known balsa, are almost as light as pith.

MAGIC RITUAL PLAYS PART IN AFRICAN INDUSTRY

By W. D. Hambly
Assistant Curator of African Ethnology

In aboriginal negro society, apprenticeship, initiation as a skilled craftsman, and the production of satisfactory work in native handicrafts and industry, are deeply involved in ritual and magic. Among the objects acquired in Angola by the Frederick H. Rawson-Field Museum Expedition to West Africa (1929) is a set of blacksmith's tools, which are so simple in structure and so obvious in their use, that the difficulty experienced in obtaining them would hardly be suspected.

On arriving among the Ovimbundu of Angola I was anxious to find to what extent ritual in handicraft survived. No objection was made by the tribesmen to an inspection of their tools and processes, or to making photographs of these; but no monetary offer could persuade a blacksmith to part with his tools, despite the fact that he had the material and skill for making others. The money offered was sufficient to reimburse a man not only for the tools themselves, but for loss of time suffered during the manufacture of new implements. Yet the blacksmiths remained obdurate.

The tool to which most importance was attached is the large hammer, now shown in Hall D, which the blacksmith wields at his anvil. This was finally obtained at Elende, Angola, after much difficulty in overcoming the owner's reluctance to part with it.

A boy who wishes to become a blacksmith must serve an apprenticeship of two years during which he receives no pay—only instruction by the master blacksmith. At the end of this time the youth asks for an examination which the master conducts in a practical way by asking his pupil to make the blade of a hoe, an ax head, or some other article in demand.

When this task is successfully performed, a day is arranged for formal initiation of the novice, who must stand on the small anvil during the entire ceremony. Meanwhile the master has made for his pupil a complete set of tools, and in his turn the novice promises not to part with these under penalty of dire misfortune. In earlier days death was the penalty of a man who disposed of the large hammer.

While the large hammer is hot, and at the moment of its completion, a dog is killed with it. About the same time a goat and four chickens are killed. All the newly presented tools are placed close together so that they may be conveniently sprinkled with blood from the sacrificed animals. The master blacksmith turns to his pupil, standing on the anvil, and says, "You may speak and tell us what name you want." The boy may say, "I am Ndumbu," whereupon the spectators clap hands and make a trilling with their fingers in their mouths. Then, in the words of my interpreter, "the boy steps from the anvil; he is a blacksmith; he must work hard, and people must pay him; he used to work hard, but his master took the money."

I noticed that, although clay for making pottery was easily obtainable at a pit near the village, women made an unnecessary journey to secure clay. The reason for this was the consecration of a particular spot by the medicine-man, who killed a chicken and allowed its blood to drop on the clay. In some mysterious manner this ritual act was supposed to sanctify the clay. Similarly a rock must be consecrated as a surface for pounding grain. Likewise, ritual is important in connection with the hunter's occupation.

A hunter serves an apprenticeship when young, and his formal initiation is similar to that of a young blacksmith. His bow and arrows are sprinkled with blood of sacrificed animals, and presented to him by his trainer. A hunter is expected to use certain pottery vessels for cooking. These utensils are for his exclusive use. The bows and arrows of dead hunters are kept in a hut which is entered only by a professional adult hunter who lives near-by. The night before the hunt he pours over the weapons of his predecessors a libation of beer mingled with the blood of a sacrificed fowl.

During life a hunter mounts the skulls of slain animals on poles near his dwelling. At death he is the only person who is buried in a stone tomb, which is situated on the top of a rocky hill.

Fossil scales of the earliest known fishes, which lived about 590,000,000 years ago, are included among the exhibits in Ernest R. Graham Hall.

SPRING LECTURE COURSE BEGINS MARCH 4

The Fifty-ninth Free Lecture Course to be presented by Field Museum will open on Saturday, March 4, and continue on Saturday afternoons through March and April. There will be nine lectures on science and travel, illustrated with motion pictures and stereopticon slides. All the lectures will be given in the James Simpson Theatre of the Museum, and will begin at 3 P.M. Following is the complete schedule of dates, subjects, and speakers:

March 4—What I Have Discovered in the Arctic and Antarctic
(*By Dog Team, Airplane and Submarine*)
Captain Sir Hubert Wilkins, F.R.G.S., New York City

March 11—Jungle Trails of the Congo
Colonel Charles Wellington Furlong, F.R.G.S., Cobasset, Massachusetts

March 18—Around the Globe in the *Camargo*
Amos O. Burg, Portland, Oregon

March 25—The Tarahumara Indians—the Cave Dwellers of Northern Mexico
Robert M. Zingg, University of Chicago

April 1—Land o' Peaks and Sky Blue Waters
Fred Payne Clatworthy, Estes Park, Colorado

April 8—The Canadian Arctic and Its People
Richard Finnie, F.R.G.S., Ottawa, Canada

April 15—Hunting Whales
Chester Scott Howland, New Bedford, Massachusetts

April 22—The Utah Fairyland of Bryce Canyon National Park
Dr. C. O. Schneider, Chicago

April 29—Jungle Gods
Captain Carl von Hoffman, New York City

No tickets are necessary for admission to these lectures. A section of the Theatre is reserved for Members of the Museum, each of whom is entitled to two reserved seats on request. Requests for these seats may be made by telephone or in writing to the Museum, in advance of the lecture, and seats will then be held in the Member's name until 3 o'clock on the day of the lecture. Members may obtain seats in the reserved section also by presentation of their *membership cards* to the Theatre attendant before 3 o'clock on the lecture day, even though no advance reservation has been made. All reserved seats not claimed by 3 o'clock will be opened to the general public.

WILD PINEAPPLES

By Paul C. Standley
Associate Curator of the Herbarium

Tropical fruits common in the markets of the United States are bananas, pineapples, and the citrus fruits: oranges, grapefruit, and lemons. The only one native to America is the pineapple. Although this fruit is grown throughout the tropics, and the supply for the United States comes from Cuba and the Isle of Pines, and from Hawaii, the plant is a native of Brazil. Before Columbus' time it was probably unknown north of South America.

Field Museum has received from Roy Carr, of the Ford Industrial Company of Brazil, preserved material of the primeval pineapple plant as it grows wild in the Amazon Valley. This ancestor of the modern cultivated plant is a striking contrast to the huge Cuban pineapples sold in our markets. The two plants are similar in general appearance, but the fruit of the wild plant is little larger than a hen's egg, and is too sour and acrid to be eaten with comfort.

This wild plant is of a smooth-leaved variety, and is of importance as a source of fiber for the making of twine and other articles in which length, strength, and fineness of fibers are desirable. The smooth, silky fiber of some varieties of cultivated pineapple is likewise used in some parts of the world. In Hall 28 there is an exhibit of textiles and laces made of this fiber.

Pineapples thrive in Florida, and formerly were grown there for the northern market, but it has proved possible to import them at less expense than to grow them domestically. A striking reproduction of a fruiting pineapple plant, with its rarely seen blue flowers, is exhibited in the Hall of Plant Life (Hall 29).

Pineapples were introduced to Europe shortly after Columbus' discovery of America, and they spread thereafter all over the world probably more rapidly than any other introduced plant.

LIZARDS OF THE CHICAGO AREA

By Karl P. Schmidt
Assistant Curator of Reptiles

The scarcity of lizards in the Chicago area has led to the erroneous application of the name to the local salamanders, which are lizard-like in shape but are otherwise very different. They are not reptiles at all, but amphibians. True lizards are typical reptiles. Numerous species inhabit our southern states and many more are found in the southwest, which is one of the great lizard centers of the world.

In the Chicago area, i.e., within fifty miles of the center of the city, three very distinct kinds of lizards have been found. One of these is the five-lined skink, a shiny-scaled creature with five golden stripes on the black ground color of the back and sides, and a brilliant azure blue tail in the young. This species is abundant in southern Illinois but is rare near Chicago, though it is found somewhat farther north.

In the Indiana dunes we have a more abundant lizard in the six-lined race-runner. It lives in shallow burrows beneath the moss or leaf-mold, coming forth on bright days to capture its insect food and to bask in the sun. This species is our representative of a family of lizards whose variety of form, color and size in a host of species is one of the features of the American tropics.

Our most remarkable lizard is the all too scarce "glass snake." As its name implies, the glass snake is limbless and, to that degree, snakelike. It is readily distinguishable from all snakes by its evident ear openings and well developed eyelids. The glass snake's tail breaks off with great ease and without serious injury to its owner, for no blood is lost and the tail grows out again in time. In this species the tail is considerably longer than the body, so that a glass snake may actually be broken in two without injury to its vital organs. These facts are only a little less remarkable than the fallacious belief that the glass snake can reassemble its parts after being broken with a stick.

An unusually handsome specimen of this species was recently found in the territory just south of the dune region of Indiana by Maurice Weil, who presented it to Field Museum of Natural History.

A large collection of the curious forms of rocks, clays and sands known as concretions is on exhibition in the Department of Geology.

MARCH GUIDE-LECTURE TOURS

Conducted tours of exhibits, under the guidance of staff lecturers, are made every afternoon at 3 P.M., except Saturdays, Sundays, and certain holidays. Following is the schedule of subjects and dates for March:

Wednesday, March 1—Spring Birds; Thursday—General Tour; Friday—Egyptian Burials.

Week beginning March 6: Monday—Fishes, Past and Present; Tuesday—Minerals; Wednesday—Makers of Totem Poles; Thursday—General Tour; Friday—China and Its Art.

Week beginning March 13: Monday—Primitive Uses of Bark; Tuesday—Musical Instruments; Wednesday—Cereals and Their Uses; Thursday—General Tour; Friday—South Seas Exhibits.

Week beginning March 20: Monday—Primitive African Art; Tuesday—Life in the Far North; Wednesday—Prehistoric Life; Thursday—General Tour; Friday—Cryatala of Artistic and Economic Value.

Week beginning March 27: Monday—Animal Habitat Groups; Tuesday—Industrial Models; Wednesday—Trees and Wood Products; Thursday—General Tour; Friday—Archaeology of South America.

Persons wishing to participate should apply at North Entrance. Tours are free and no gratuities are to be proffered. A new schedule will appear each month in Field Museum News. Guide-lecturers' services for special tours by parties of ten or more are available free of charge by arrangement with the Director a week in advance.

Gifts to the Museum

Following is a list of some of the principal gifts received during the last month:

From John T. Pirie—a sharp-shinned hawk, Illinoia; from Phillip Vainisi—a scorpion, Cuba; from Martin Petersen—an armored catfish, South America; from Dr. S. C. Bishop—a small boa; from Companhia Ford Industrial do Brasil—21 herbarium specimens with accompanying wood specimens, Brazil; from University of Texas—110 herbarium specimens, Austin, Texas; from Fritzsche Brothers—75 samples of perfume ingredients; from Crane and Company, Inc.—16 paper and linen products; from Mrs. Charles W. Dempster—a porcelain ewer and plate, and a gourd teapot, Japan; from Herbert J. Devine—a clay figurine of rhinoceros of Han period, China; from Air Reduction Sales Company—a cabinet of eight tubes of rare gases of the atmosphere; from William B. Pitts—5 specimens wax opal, Nevada; from Allan Caplan—6 specimens pickeringite and goslarite, Colorado; from H. H. Nininger—2 photographs of Huizopa meteorite, Colorado; from Hayden Lake Mining and Milling Company—4 specimens copper ore, Idaho; from Frank von Drasek—13 specimens minerals, Arkansas; from School of Forestry, Yale University—46 herbarium specimens, Colombia; from Dr. Román S. Flores—8 herbarium specimens, Yucatan.

NEW MEMBERS

The following persons were elected to membership in Field Museum during the period from January 17 to February 14:

Associate Members

Dr. E. H. Hohman, Mrs. John H. S. Lee, Mrs. Richard 1. Stearns.

Annual Members

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Museum Library Open to All

In addition to its assistance rendered to the scientific staff, the Library of Field Museum is open for reference purposes to the general public. Among persons it is now serving regularly are students from universities, representatives of manufacturing firms and business houses needing specific information, authors engaged in research work, and many others engaged in diverse occupations.

The fruit of a bush—jaboncillo or soapberry—is used by certain South American Indians as soap. Specimens of this and other plants of the soapberry family form an exhibit in the Hall of Plant Life.

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Field Museum News

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THE BOWER BIRD, AN AESTHETE OF THE ANIMAL KINGDOM

By Rudyerd Boulton
Assistant Curator of Birds

One generally thinks of an aesthetic sense, the appreciation of color, form, and sound for their own sakes, as an attribute solely of human beings. For example, there is no evidence that a bird will select for its mate one that is more brightly colored than its fellows, or that sings, to our ears, more beautifully than other birds. Detailed studies indicate that the songs of birds are expressions of physical vigor, and many songs are known to be warnings to rivals rather than invitations to mates.

The bower birds of New Guinea and Australia, however, definitely display a sense of beauty which makes them unique in the animal kingdom. It is the habit of these birds to build complicated structures, which they decorate in various ways and use as playgrounds during the period of courtship and mating.

A habitat group of the New Guinean fawn-breasted bower bird was recently installed in Stanley Field Hall. This is a species which builds a bower on the ground, with platforms at each end, constructed of twigs and sticks by the male bird. He devotes about two weeks to the task and performs a remarkable feat of architecture. One platform is plain, but the other is definitely decorated with fresh and colorful berries, fruits, and leaves. These are not eaten; they are purely for ornamentation. They are replaced at frequent intervals, and the bird carries the old withered decorations to a neatly maintained rubbish pile near-by, instead of scattering them about indiscriminately. On the decorated platform the male performs a courtship dance, while the female stands on the undecorated platform at the opposite end of the bower to watch. When the courtship is over, a nest is built high in a tree near-by, and the bower is used as a playground by the male.

The Museum group, consisting of both male and female birds, and a bower, illustrates the courtship stage. The birds and the bower were collected near the Sepik River in New Guinea by Assistant Curator Karl P. Schmidt and Walter A. Weber while members of the Cornelius Crane Pacific Expedition of Field Museum in 1929. The birds were mounted by Assistant Taxidermist John W. Moyer.

Another species of bower bird uses shells and shiny pebbles for decorations, while a third species builds a mossy roofed hut and distributes flowers and bright petals on the carefully leveled dooryard of moss, renewing them as fast as they wither. An Australian bower bird has recently adopted as cherished decorations for its playground pieces of broken china and glass bottles, showing that the selection of materials is not an iron-bound, inherent mechanical reflex. Here, indeed, is an artistic genius among bower birds! One can think of many parallels in human society, but conscious effort devoted to a non-utilitarian result is not common among animals. The hoarding of bright-colored objects by jays and crows is one of the few comparable instances known. Activity of this kind is, no doubt, an outgrowth of secondary sexual characteristics, such as the drumming of the ruffed grouse and the dancing of the prairie chicken, which, as in the case of the bower birds, is performed by the males whether or not any females are present. It is dangerous to describe these actions in the anthropomorphic terms of human psychology and behavior, yet, in default of detailed modern studies, one is left no choice.

Bower Bird Group in Stanley Field Hall

The male bird is seen performing his courtship dance on the platform decorated with fruits and berries, while the female watches through the bower.

Gift from C. Suydam Cutting

Through the generosity of C. Suydam Cutting of New York, Field Museum has received an extremely interesting collection of birds and mammals from Upper Burma. The collections were made by Lord Cranbrook and Captain F. Kingdon Ward. Among the most interesting specimens are several rare water shrews and moles, and paratypes of two species of new babbling thrushes, recently described by N. B. Kinnear of the British Museum (Natural History). A pair of very rare blood pheasants is also included.

JEHOL PAGODA MODEL ON EXHIBITION

By Berthold Laufer
Curator, Department of Anthropology

An exact miniature reproduction of a pagoda in the imperial palace of Jehol, China, the region recently invaded by the Japanese, is on exhibition in the South Gallery on the second floor at Field Museum. The original of this pagoda, which is octagonal in shape, contains nine stories and is 213 feet high. It is one of the finest pagodas in northern China.

Between the years 1751 and 1765, the Emperor K'ien-lung made four journeys through the midland provinces of his empire. On his visits to Nanking and Hangchow he was deeply impressed by the two famed pagodas of these cities —the Pao-en-ta ("Pagoda for the Reward of Kindness") and the Leu-ho-ta ("Pagoda of Six Harmonies"), models of which are also shown in the Museum's collection. He desired to have these reproduced in his summer palace at Jehol, where he had erected a temple in 1751. The plan was carried out, but one of the two pagodas was destroyed by fire and the other collapsed on its completion.

The geomancers counseled and gave the verdict that southern monuments must not be built in the north. The emperor, however, scorned their decision and ordered new and more solid building material. After ten years' labor, the pagoda was completed. Its story is told in an inscription engraved on a stone tablet and composed by the emperor. The tablet is set up in front of the pagoda on a terrace enclosed by a stone rail, and is reproduced in the Museum model. Five lion cubs playing with a ball are carved in high relief on the top. Each side is adorned with a dragon in clouds striving for the flaming pearl. Each story has four doors and four windows. The pinnacle is in the shape of an Indian stupa (tope).

The territory of Jehol formed part of Chi-li Province under the Manchu dynasty (1644–1911). Originally inhabited by roving Mongols, it was part of Inner Mongolia to which it also belongs geographically. It never was part of or in any way connected with Manchuria. For many centuries the country has been settled by Chinese agriculturists. The Mongols returned to their steppes, and through hard labor the Chinese farmers transformed the inhospitable mountain region into fertile land.

The Museum's economic botany collections include a display of oils, resins and lacquers.

Field Museum of Natural History

Founded by Marshall Field, 1893

Roosevelt Road and Lake Michigan, Chicago

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FIELD MUSEUM NEWS

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Field Museum is open every day of the year during the hours indicated below:

November, December, January	9 A.M. to 4:30 P.M.
February, March, April, October	9 A.M. to 6:00 P.M.
May, June, July, August, September	9 A.M. to 6:00 P.M.

Admission is free to Members on all daya. Other adults are admitted free on Thursdays, Saturdays and Sundays; non-members pay 25 cents on other days. Children are admitted free on all days. Students and faculty members of educational institutions are admitted free any day upon presentation of credentials.

The Museum's natural history Library is open for reference daily except Saturday afternoon and Sunday.

Traveling exhibits are circulated in the schools of Chicago by the N. W. Harris Public School Extension Department of the Museum.

Lectures for schools, and special entertainments and tours for children at the Museum, are provided by the James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures.

Announcements of free illustrated lectures for the public, and special lectures for Members of the Museum, will appear in Field Museum News.

A cafeteria in the Museum serves visitors. Rooms are provided for those bringing their lunches.

Chicago Motor Coach Company No. 26 buses go direct to the Museum.

Members are requested to inform the Museum promptly of changes of address.

MEMBERSHIP IN FIELD MUSEUM

Field Museum has several classes of Members. Benefactors give or devise $100,000 or more. Contributors give or devise $1,000 to $100,000. Life Members give $500; Non-Resident Life and Associate Members pay $100; Non-Resident Associate Members pay $50. All the above classes are exempt from dues. Sustaining Members contribute $25 annually. After six years they become Associate Members. Annual Members contribute $10 anoually. Other memberships are Corporate, Honorary, Patron, and Corresponding, additions under these classifications being made by special action of the Board of Trustees.

Each Member, in all classes, is entitled to free admission to the Museum for himself, his family and house guests, and to two reserved seats for Museum lectures provided for Members. Subscription to Field Museum News is included with all memberships. The courtesies of every museum of note in the United States and Canada are extended to all Members of Field Museum. A Member may give his personal card to non-residents of Chicago, upon presentation of which they will be admitted to the Museum without charge. Further information about memberships will be sent on request.

BEQUESTS AND ENDOWMENTS

Bequests to Field Museum of Natural History may be made in securities, money, books or collections. They may, if desired, take the form of a memorial to a person or cause, named by the giver.

Cash contributions made within the taxable year not exceeding 15 per cent of the taxpayer's net income are allowable as deductions in computing net income under Article 251 of Regulation 69 relating to the income tax under the Revenue Act of 1926.

Endowments may be made to the Museum with the provision that an annuity be paid to the patron for life. These annuities are tax-free and are guaranteed against fluctuation in amount.

NEW RARE GAS EXHIBIT

By Henry W. Nichols
Associate Curator of Geology

A collection of rare elemental gases of the argon family has been presented to the Museum by the Air Reduction Sales Company of Chicago, and is now exhibited in the corridor connecting Hall 36 and Frederick J. V. Skiff Hall (Hall 37). The gases are seen glowing with the bright colors they radiate when used in neon and similar signs. Normally these gases are colorless and invisible, but if maintained in a partial vacuum they can be excited to luminosity by the passage of a suitable electric current. In the exhibit five gases—argon, neon, helium, krypton and xenon—radiate characteristic colors from five tubes. Three other tubes show the colored glow of mixtures of these gases, and a modification of color by the vivid green fluorescence they induce in uranium glass.

The gases of the argon family are rare, being found nowhere in more than minute quantities. Some are found in certain natural gases and in a few rare minerals. All are found in minute quantities in the air. They are all inert chemically; that is, they cannot combine with other elements, but are always in the free state. Their scarcity and inert nature delayed their discovery until years after most other chemical elements had been classified. It was not until 1894 that the first of them, helium, was isolated from the rare mineral, uraninite or pitchblende. The four others in this exhibit were found in 1895, in the residues from evaporating liquid air.

Neon, helium and argon now have an important place in industry. The evening aspect of business streets has been brightened by the red glow of neon signs. Neon light is used also for signaling. Miniature neon bulbs provide the light for television receivers, and recently have been added to radio receivers to indicate the point of correct tuning. Other miniature neon tubes detect the presence of high tension currents and are used to indicate defective spark plugs in automobiles. One part of neon is found in 80,000 parts of air.

Helium provides a yellow light for lamps of the neon type, but its most important use is for inflating balloons. Next to hydrogen it is the lightest gas known, and as it is absolutely non-inflammable it provides safety for the balloon at only a slight sacrifice of lifting power. It is present in air in the proportion of one part helium to 250,000 parts air. The commercial supply is obtained from certain natural gas wells. It is also found in a number of radio-active rare minerals. Helium is one of the few elements of known origin. It is a product of the disintegration of the elements uranium, radium and thorium, and is constantly being formed as these elements are destroyed. It might be supposed, since new helium has been forming ever since the beginning of the earth, that by this time so much would have accumulated it would no longer be rare. There are two reasons why this has not happened. The parent elements are rare, and helium constantly escapes into space from the upper atmosphere. The gas is so light that the earth's attraction is unable to hold helium that has diffused upward to the limits of the atmosphere.

Argon provides a dull blue color for luminous signs. More important, when incandescent lamp bulbs are filled with it the quality of the light is improved, and the life of the lamp and economy of its operation are increased. It is the most abundant of the rare gases, one part being present in 125 parts of air.

The two other gases in the exhibit, krypton and xenon, are so rare that they have at present little or no commercial use. Krypton is present in air only to the extent of one part in 2,000,000, and xenon in the almost infinitesimal quantity of one part in 17,000,000 parts air.

PASSION FLOWERS

The passion flowers constitute a small New World family of tropical and subtropical climbers with a few shrubs or trees. Several species are cultivated for their fruit and for their curious flowers.

The flowers owe their characteristic appearance to a conspicuous circle of colored filaments and to the elevation of pistil and stamens on a column. The name refers to the legend originated by the early Spanish missionaries who saw in these flowers emblems of the crucifixion or "passion of Our Lord." The corona of filaments suggested the crown of thorns, the stigmas the spikes, the stamens the three wounds, the tendrils the scourges, and the parts of the floral envelope the ten apostles.

A flowering and fruiting passion flower vine, the Granadilla, and several smaller passion flower fruits, are to be seen in the Hall of Plant Life (Hall 29). The edible part of the passion flower fruit is, as in the pomegranates, the pulpy covering of the seeds, which has an acid-sweet aromatic flavor greatly esteemed in the tropics as a flavoring for ices and for cool refreshing drinks.

ORIGIN OF UNICORN LEGEND

The unicorn of mythology has three principal counterparts in actual animal life, to each of which has been attributed the origin of legends concerning this queer one-horned beast which never existed. Of these, two are represented by mounted examples among the zoological exhibits at Field Museum—the Tibetan antelope or chiru (in George M. Pullman Hall, Hall 13), and the oryx or beisa antelope of Africa (in Carl E. Akeley Memorial Hall, Hall 22), while specimens of the third, the nilghai or blue bull of India, are in the Museum's collections being prepared for exhibition.

The basis of the unicorn legends is probably an optical illusion on the part of ancient peoples, it is asserted by Museum zoologists and anthropologists. At a distance, all three of the above mentioned animals, which have parallel upright horns, may appear from a side view to be one-horned. The other characteristics assigned to the unicorn in ancient descriptions—head and body of a horse, hind legs of an antelope, tail of a lion or a horse, and sometimes the beard of a goat—were probably the results of active imaginations stimulated by the fleeting sight from a distance of swift animals about which little or nothing was known.

On zoological grounds the oryx of Africa would appear the most likely to have originated the unicorn myth. But on historical grounds, because of its being an inhabitant of the parts of Asia whence the legends sprang, the blue bull would seem the most likely, although zoologically it is of the three the least like pictures of unicorns.

A large collection of pseudomorphic minerals—i.e., minerals which by substitution or alteration assume the forms of other species—is shown in the Department of Geology.

THE AGE OF THE EARTH

By Sharat K. Roy
Assistant Curator of Invertebrate Paleontology

How old is the earth and how may one know its age? This question has perplexed humanity for centuries. James Hutton, one of the founders of geological science, despairingly declared, "No vestige of a beginning—no prospect of an end." Since his time, however, geology has progressed rapidly, and various methods have been advanced to estimate the earth's age.

The oldest method was based on the rate at which land was eroded and deposited in the seas, estimates being made by taking the observed thickness of the entire geologic column and dividing by the rate at which sediments are now being laid down. Early in this century several such estimates were made, and the earth's age, since solidification from its molten stage, was computed at 100,000,000 years. However, this figure was challenged because, to begin with, there is no trustworthy starting point for reckoning the total thickness of the sediments. Secondly, the rate of sedimentation, due to changes in climate and in the elevation of land, has varied through the ages. Finally, there is no record of the vast length of time that has elapsed between the periods of sedimentation.

Another method once used by geologists and geo-chemists was based on the rate at which salts were dissolved from the lands and accumulated in the oceans. The total amount of salts in the oceans was divided by the present rate of annual supply. This method gives an age estimate about the same as that based on the rate of sedimentation. But again difficulties appear. Neither the area of the continents nor their relief in the past was the same as today. Hence, the stream gradient and its power of dissolving salts from the land surfaces have not been the same. Also, it is not known how much salt the ocean derived from other sources, such as the shore line, ocean beds, and volcanic actions. Nor is it known if the oceans were essentially uniform in volume throughout the ages or if they grew to their present volume from a small beginning.

Still another method of computation was based on the rate at which one species of life changed to another in successive geological periods. The physical history of the earth was divided into twelve periods, and it was assumed that 20,000,000 years were required for an entire change in the species of each period, or 240,000,000 years in all. This, however, did not include the time before life existed on the earth. Furthermore, while our conception of the passage of one species to another is well founded, the rate of change has varied according to species. On the one hand we have records of species which have withstood all possible environmental changes, and, on the contrary, we know of types of life which have yielded so rapidly to change that their evolution is almost explosive. With these conflicting evidences, it is hardly possible to use this paleontological record as a basis for a concrete expression of geologic time.

Other methods likewise have been used but were unable to withstand critical analyses, because the uniformity of the rate of action which is the criterion for computing geological time could not be relied upon. Nevertheless, the search for a process in nature that takes place in direction only, and does not change its rate of action, eventually was discovered. Not long ago, it was experimentally proved that such a process was present in the atomic disintegration of various radio-active elements contained in certain rocks and minerals. This opportune and valuable discovery has become the present accepted basis for measuring the age of the earth, and has given excellent results.

The radio-active minerals are commonly found in igneous rocks. The parents of the whole series of radio-active minerals are uranium and thorium. Each of these parental elements transforms through a succession of changes. The final products of uranium are helium and an isotope of lead. The rate of this transformation is known, and data for calculating the age of the mineral and with it the rock formation of which it is a part, can be obtained by measuring the quantities of helium and lead in the rock and comparing them with a quantity of uranium in the same volume of material. Helium, however, is a gas, and probably a portion of it leaks out. Consequently, estimates of age on the basis of helium ratios should be regarded as minimum. But estimates based on the lead ratios, when the mineral is fresh and primary, offer results that carry great weight as reliable indicators of age.

Up to the present time, the highest reliable lead ratio indicates the passage of 1,460,000,000 years. This has been computed from the Keystone uraninite of the Black Hills, South Dakota, the most ancient uraninite yet discovered. Its age, however, does not represent the maximum age of the earth, as the mineral occurs in a pegmatite dike which is intrusive into a still older rock. What the age of the older rock is, cannot be estimated from the available geological data. All that can be stated definitely now is that the age of the earth far exceeds 1,460,000,000 years.

Material from Utah Cliff-Houses

An unusual and excellent collection of archaeological material from cliff-houses of Utah has been installed in Hall 7. It comes from cliff-houses built about A.D. 900–1300. The exhibit includes crutches, a cane, baskets, beans, squash seeds, raw cotton and cotton products, yucca sandals, cordage, cradles, agricultural implements, a bow-drill, and a wooden head rest. The remarkable preservation of these perishable articles is due to the extreme and permanent aridity of the large caves in which they were buried.

"Three Kingdoms of Indo-China"

An excellent account of the journeys into remote places and the adventures experienced by members of the William V. Kelley–Roosevelts Expedition to Eastern Asia for Field Museum is to be found in a book, *Three Kingdoms of Indo-China*, recently published. The authors are Harold J. Coolidge, Jr., leader of the Indo-Chinese division of the expedition, and Colonel Theodore Roosevelt, who was one of the leaders of the expedition as a whole. The book is written in popular style, giving to the lay reader a clear idea of how a large scientific expedition conducts its work, and the many difficulties and problems that beset it. The book is copiously illustrated with photographs taken by the explorers. The Thomas Y. Crowell Company is the publisher.

For purposes of comparison, an exhibit of specimens of fossil and modern forms of life of similar species is on view in Stanley Field Hall.

HOPI DOLLS

By Paul S. Martin
Assistant Curator of North American Archaeology

A case of Hopi dolls or katcinas has been placed on exhibition in Hall 7. These dolls are carefully made so as to show in miniature the headdresses, symbolic masks, ornaments, and clothing worn by the masked dancers who impersonate supernatural beings or katcinas. Such figures are never worshiped and are not idols in any sense.

At the conclusion of one of the great rain-making ceremonies, the masked dancers run through the village streets, distributing dolls like these and other presents to the young children.

Hopi Doll
On the headdress are representations of ears of maize.

The reason for impersonating the supernatural beings is explained in the following Hopi legend:

Long ago, the gods or katcinas used to live with the people and teach them how to hunt, plant seeds, make pottery and baskets, and build houses of stone. After a time they became displeased with the people and withdrew from the villages to the high mountains. Then no rain fell, the fields became dry and thirsty, and desolation and misery spread over the land. After the people had suffered a long time, the gods relented somewhat and told them that they might wear masks and costumes to represent the gods who had formerly dwelt with them, and that they might dance the katcina dances which bring the rain. If all instructions were honorably carried out, the katcina would "possess" the dancers and rain would surely fall.

So now, every year, with great faithfulness, the Indians wear costumes and masks to represent the gods and dance their dances so that rain will fall and the harvest will be bountiful.

Rare Book Presented to Library

A monumental work of the greatest rarity has just been presented to the Museum Library from the estate of John B. Lord by Mrs. Robert E. Ross, Mrs. Joseph H. King, and Mrs. William E. Pratt. It is the catalogue of the famous collection of Oriental porcelains of William T. Walters in Baltimore, and was published in 1897. It consists of ten superbly bound volumes (17 x 23 inches), arranged in five portfolios, and containing 116 exquisite plates in colors and more than 400 reproductions in black and white. The text, written by S. W. Bushell, has been reprinted in a handy octavo volume. The edition was limited to 500 copies, most of which were distributed among the subscribers. The work has been out of print for more than twenty years.

Fishes of Florida and other Gulf Coast waters are represented in an exhibit in Albert W. Harris Hall.

FIVE ILLUSTRATED LECTURES TO BE GIVEN IN APRIL

Of the spring course of lectures on science and travel, five remain to be given on Saturday afternoons during April. The lectures are illustrated with motion pictures and stereopticon slides. They begin at 3 P.M., and are given in the James Simpson Theatre of the Museum. Admission is free. Following are the dates, subjects, and speakers scheduled:

April 1—Land o' Peaks and Sky Blue Waters
Fred Payne Clatworthy, Estes Park, Colorado

April 8—The Canadian Arctic and Its People
Richard Finnie, F.R.G.S., Ottawa, Canada

April 15—Hunting Whales
Chester Scott Howland, New Bedford, Massachusetts

April 22—The Utah Fairyland of Bryce Canyon National Park
Dr. C. O. Schneider, Chicago

April 29—Jungle Gods
Captain Carl von Hoffman, New York City

No tickets are necessary for admission to these lectures. A section of the Theatre is reserved for Members of the Museum, each of whom is entitled to two reserved seats on request. Requests for these seats may be made by telephone or in writing to the Museum, in advance of the lecture, and seats will then be held in the Member's name until 3 o'clock on the day of the lecture. Members may obtain seats in the reserved section also by presentation of their *membership cards* to the Theatre attendant before 3 o'clock on the lecture day, even though no advance reservation has been made. All reserved seats not claimed by 3 o'clock will be opened to the general public.

RAYMOND FOUNDATION PRESENTS PROGRAMS FOR CHILDREN

Five more of the spring series of free motion picture programs for children, provided by the James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures, remain to be given on Saturday mornings during April. Following are the dates, and the titles of the films to be shown on each:

April 1—The Tortoise and His Cousins; The Frontier Woman

April 8—The Rhino Meets an Automobile; A Dyak Wedding; A Trip Through Yellowstone Park

April 15—The Realm of the Honeybee; Among the Elephant Seals

April 22—A Trip to Penguin-land; Peter Stuyvesant

April 29—From Egg to Butterfly; Flower Friends of Brook and Roadside; Wild Wings

Each program is given twice, at 10 A.M. and at 11, in the James Simpson Theatre of the Museum. Children from all parts of Chicago and suburbs are invited to attend. No tickets are required for admission.

"Dragon's Blood" Resin

"Dragon's blood" is the name given to a bright red resin exuding from the fruit of rattan palm, native of southeastern Asia. It is used for giving a deep red color to spirit varnish (see exhibit in Hall 28, and the rattan palm case in Hall 25).

Remarkable Slate Cleavage Shown

Columns of Welsh slate exhibited in Clarence Buckingham Hall (Hall 35) illustrate the perfection sometimes attained in the cleavage of slate, which was so important when slate roofs were in more general use. One column six feet long and nearly six inches wide has been cleaved by Welsh quarrymen into uniform sheets one-eighth of an inch thick; another six-foot column has been divided into plates only one-sixteenth of an inch thick. These columns also show a flexibility and strength not to be expected in a common rock. The lower half of each column is compressed between iron clamps so firmly that in one instance no trace of the cleavage can be seen, yet it has been possible to spread the tops of the sheets fanwise to show their thinness.

SPECIAL NOTICE

Members of the Museum who have changed residences or plan to do so are urged to notify the Museum of their new addresses, so that FIELD MUSEUM NEWS and other communications may reach them promptly.

Members going away during the summer, who desire Museum matter sent to their temporary addresses, may have this service by notifying the Museum.

Pomegranates

Pomegranates have been cultivated since ancient times. They are natives of the Levant, and are said to have been introduced into northern Africa and southern Europe by the Carthaginians, whose Latin name *Punicus* has been applied to the pomegranate tree. They are now grown for fruit and for ornament in all warm countries.

Of the two species recognized, one is wild in the Balkan countries and through Persia to the Himalayas and northwest India. In the Caucasus there are said to be found entire forest formations composed exclusively of wild pomegranates and pears. The other species is indigenous to the island of Socotra, off the Arabian coast.

A flowering and fruiting branch of the pomegranate is to be seen in the Hall of Plant Life (Hall 29).

China's Bronze Age

The bronze age of China (about 1500 B.C. to A.D. 220) is the subject of exhibits in George T. and Frances Gaylord Smith Hall (Hall 24). Among unusual objects in the collection is a caltrop or four-spiked military instrument so designed that however it fell one spike would point upward. On roads where enemy cavalry was to pass caltrops were scattered to wound the horses' feet.

Of interest also is a water-clock or clepsydra. A steady dripping of water into a vessel was permitted and time was measured by the rise of the water to notches marking the hours on a wooden rod. Large bronze drums produced in early times are another feature. Manufacture of such drums ceased centuries ago, states Dr. Berthold Laufer, Curator of Anthropology, and by the twelfth century they were esteemed by the Chinese themselves as antiquities. They were a development from drums of aboriginal tribes conquered by the Chinese.

APRIL GUIDE-LECTURE TOURS

Conducted tours of exhibits, under the guidance of staff lecturers, are made every afternoon at 3 P.M., except Saturdays. Sundays, and certain holidays. Following is the schedule of subjects and dates for April:

Week beginning April 3: Monday—Birds at Home; Tuesday—Chinese Halls; Wednesday—Looms and Textiles; Thursday—General Tour; Friday—Mexico.

Week beginning April 10: Monday—Indians of the Southwest; Tuesday—Plants and Animals of the Past; Wednesday—Roman Exhibits; Thursday—General Tour; Friday—Primitive Clothing.

Week beginning April 17: Monday—Eskimo Life; Tuesday—Egypt; Wednesday—Fibers and Their Uses; Thursday—General Tour; Friday—Gems and Jewelry.

Week beginning April 24: Monday—Moon and Meteorites; Tuesday—Animal Life of North America; Wednesday—Woodland Indians; Thursday—General Tour; Friday—Peoples of the South Seas.

Persons wishing to participate should apply at North Entrance. Tours are free and no gratuities are to be proffered. A new schedule will appear each month in FIELD MUSEUM NEWS. Guide-lecturers' services for special tours by parties of ten or more are available free of charge by arrangement with the Director a week in advance.

Gifts to the Museum

Following is a list of some of the principal gifts received during the last month:

From Northwestern University—skeleton of Indian elephant; from Miss Louise Christopher—2 gypsum rosettes, South Dakota; from Park Richmond and Company—a mahogany board, Santo Domingo, West Indies; from Professor Lorenzo R. Parodi—21 herbarium specimens, Argentina; from Garfield Park Conservatory—a trunk of *Livistona* palm; from Agricultural Experiment Stations of the University of Florida—50 specimens of pecans; from Dr. E. E. Sherff—33 herbarium specimens, Hawaiian Islands; from School of Forestry, Yale University—50 herbarium specimens, Ecuador; from C. Suydam Cutting—133 small mammal skins with 127 skulls, and 70 bird skins, Upper Burma; from Philip Hershkovitz—a cave salamander and 3 lizards, Texas; from F. A. Mitchell-Hedges—an elephant beetle.

NEW MEMBERS

The following persons were elected to membership in Field Museum during the period from February 15 to March 15:

Associate Members

Mrs. Russell D. Hill, John C. Hintz, Miss Ruth Wilkins.

Annual Members

C. W. Allen, W. Austin Amory, Miss Randi Andersen, George J. Avery, Mrs. A. M. Barrett, William A. Bond, T. M. Coen, Paul W. Cook, Miss Margaret Frank, Mrs. G. H. Griffith, Mrs. Elvin W. Howland, Mrs. E. A. Kaumeyer, A. L. Myrland, John K. Platner, O. Jay Smith, Charles F. Thomas, George W. Traver, Frank V. Zintak.

Mrs. Roosevelt Sr. Visits Museum

Mrs. Theodore Roosevelt, Sr., widow of the late President Theodore Roosevelt, visited Field Museum recently to see the habitat groups of Asiatic animals in William V. Kelley Hall composed of specimens collected by her sons, Colonel Theodore Roosevelt and Kermit Roosevelt. She had stopped in Chicago on her way home from a trip to the Philippines where she had been visiting Colonel Roosevelt, Governor-General of the islands. James Simpson, sponsor of one of the Roosevelt expeditions, accompanied her to the Museum.

Wood Exhibits Aid Builders

Persons interested in the construction of buildings, or the manufacture of products involving the use of woods, find much assistance in selecting the woods best suited to their particular purposes by consulting exhibits of American and foreign woods occupying two halls at Field Museum.

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Field Museum News

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Vol. 4 MAY, 1933 No. 5

GREAT GAUR OX OF ASIA SHOWN IN NEW GROUP

By Wilfred H. Osgood
Curator, Department of Zoology

An important addition to the habitat groups of Asiatic mammals in William V. Kelley Hall (Hall 17) is a group of the great bovine known as the gaur or seladang (also spelled sladang). This group makes the fourth in the Museum representing the principal wild oxen of present times, the others being the African or Cape buffalo, the Indian or water buffalo and the American bison. Although less generally known, the gaur is perhaps the finest of all, since it is the equal of any in size and strength, while its rich coloration and striking markings give it a high degree of distinction.

The gaur is mainly a forest animal and prefers hilly or mountainous country. Formerly it was to be found in practically all the wooded hills of India south of the Himalayas and thence it extended into Burma, Siam and Indo-China. Like most forest-dwellers, however, it is shy and wary, and in recent years it has retired before man until now it is found only in the more remote and less frequented parts of its original range. The establishment of large reserves has contributed to its preservation and, although it is reduced in numbers, it is probably in no immediate danger of extinction.

As an object of the chase, the gaur stands high in the regard of sportsmen. The magnificent head with its massive, polished horns furnishes a trophy of unusual quality and one which cannot be obtained easily. Opinions differ in regard to the dangers of hunting this animal. Some go so far as to consider it the most dangerous of all wild game, but the evidence is not convincing. Under sufficient provocation it will undoubtedly charge furiously and carry through with extreme vindictiveness. On the other hand, it is known to be exceedingly alert and inclined to flee precipitately at the slightest alarm. It feeds morning and evening about the edges of grassy openings and spends the day quietly in the forest depths. It requires very careful stalking with much attention to the wind, for it is very keen of scent, and its heavy body does not succumb readily to a bullet inaccurately placed. In thick cover, therefore, hunting it may well be difficult and hazardous.

In spite of its size and weight this ox has extraordinary speed and agility in traversing rough country, leaping over fallen timber and scaling rocky ascents with an apparent ease which has excited much comment. So far as known it has never been domesticated, and attempts to rear captured young calves have always resulted in failure. Under exceptional circumstances it may form fairly large herds, but it is commonly found in small parties of five or six to ten or fifteen.

The specimens in the Museum's group are from three sources, having been carefully selected from the results of several expeditions. The large bull fell to the rifle of Colonel Theodore Roosevelt while a member of the William V. Kelley–Roosevelts Expedition to Eastern Asia for Field Museum.

Gaur Ox or Seladang

New group placed on exhibition in William V. Kelley Hall. These animals rank among the largest, strongest and handsomest members of the bovine family.

The cow was presented by Charles Rydell of San Francisco, and the young calf was especially collected and presented for the group by George F. Ryan and George G. Carey, Jr., of Baltimore.

The taxidermy is by Julius Friesser and Arthur G. Rueckert of the Museum staff. The background, representing a scene in southern Indo-China, is by Staff Artist Charles A. Corwin.

Rare Flowers Received

A recent shipment of plants and woods received at the Museum from the plantation of the Companhia Ford Industrial do Brasil includes specimens of flowers seldom seen in botanical collections—those of the Brazil nut tree. While the fruits of this tree are readily enough obtained, since they fall when ripe, the flowers are inaccessible on account of the height of the trees, which often have their lowest branches sixty to seventy feet above the ground. It is said that the famous naturalists Humboldt and Bonpland, on their historic South American expedition which began in 1799, offered without success an ounce of gold for a specimen of these flowers. In general appearance the flowers resemble those of the cannon-ball tree exhibited in the Hall of Plant Life (Hall 29), but are much smaller.

MIGRATION OF LIMESTONE TO TROPICAL REGIONS

By Henry W. Nichols
Associate Curator of Geology

A strange consequence of changes in the world's climate since Paleozoic time is the slow migration of the limestones of temperate and arctic zones to the tropics. This phenomenon, pointed out years ago by Sir John Murray, results from a curious chain of circumstances. Although millions of tons of limestone are transported by natural forces to the tropics annually, this quantity is so small in comparison with the entire body of limestone that a geological age must elapse before the change in distribution becomes apparent.

Limestone is slightly soluble in surface and circulating underground waters. This is the reason for the hardness of the water of streams and ponds in limestone regions, and for the existence of great caverns such as the Mammoth Cave of Kentucky. Much water loaded thus with dissolved limestone eventually finds its way to the sea where currents distribute it through the ocean. The dissolved limestone is then extracted from the water by corals, shellfish, and other marine animals, which make their skeletons or shells of it. From accumulations of these skeletons and shells most limestones are formed. As these animals are more numerous and active in the warm air and water of the equatorial regions than in the cooler water of the temperate zones, the greater part of the dissolved limestone is thus withdrawn from the sea water in the tropics.

This redistribution of the limestone is due to the present cool climate of the temperate zones. In Paleozoic time when climates were more equable it did not occur. Limestones dissolved from the land were as likely to be deposited in one part of the sea as another.

The exhibits of Paleozoic fossils in Ernest R. Graham Hall (Hall 38) show large numbers of corals, crinoids, and other lime-absorbing forms which lived in the Chicago climatic zone about 400,000,000 years ago. In the zoological exhibits which illustrate present life, however, such forms occur only as specimens from the tropics and semi-tropics.

A fruit cluster of the Malayan betel palm, source of the betel nut habitually chewed by many peoples of the Oriental tropics, is on exhibition in the Hall of Plant Life.

Field Museum of Natural History

Founded by Marshall Field, 1893

Roosevelt Road and Lake Michigan, Chicago

Field Museum is open every day of the year during the hours indicated below:

November, December, January	9 A.M. to 4:30 P.M.
February, March, April, October	9 A.M. to 5:00 P.M.
May, June, July, August, September	9 A.M. to 6:00 P.M.

Admission is free to Members on all days. Other adults are admitted free on Thursdays, Saturdays and Sundays; non-members pay 25 cents on other days. Children are admitted free on all days. Students and faculty members of educational institutions are admitted free any day upon presentation of credentials.

The Museum's natural history Library is open for reference daily except Saturday afternoon and Sunday.

Traveling exhibits are circulated in the schools of Chicago by the N. W. Harris Public School Extension Department of the Museum.

Lectures for schools, and special entertainments and tours for children at the Museum, are provided by the James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures.

Announcements of free illustrated lectures for the public, and special lectures for Members of the Museum, will appear in Field Museum News.

A cafeteria in the Museum serves visitors. Rooms are provided for those bringing their lunches.

Chicago Motor Coach Company No. 26 buses go direct to the Museum.

Members are requested to inform the Museum promptly of changes of address.

MEMBERSHIP IN FIELD MUSEUM

Field Museum has several classes of Members. Benefactors give or devise $100,000 or more. Contributors give or devise $1,000 to $100,000. Life Members give $500; Non-Resident Life and Associate Members pay $100; Non-Resident Associate Members pay $50. All the above classes are exempt from dues. Sustaining Members contribute $25 annually. After six years they become Associate Members. Annual Members contribute $10 annually. Other memberships are Corporate, Honorary, Patron, and Corresponding, additions under these classifications being made by special action of the Board of Trustees.

Each Member, in all classes, is entitled to free admission to the Museum for himself, his family and house guests, and to two reserved seats for Museum lectures provided for Members. Subscription to Field Museum News is included with all memberships. The courtesies of every museum of note in the United States and Canada are extended to all Members of Field Museum. A Member may give his personal card to non-residents of Chicago, upon presentation of which they will be admitted to the Museum without charge. Further information about memberships will be sent on request.

BEQUESTS AND ENDOWMENTS

Bequests to Field Museum of Natural History may be made in securities, money, books or collections. They may, if desired, take the form of a memorial to a person or cause, named by the giver.

Cash contributions made within the taxable year not exceeding 15 per cent of the taxpayer's net income are allowable as deductions in computing net income under Article 251 of Regulation 69 relating to the income tax under the Revenue Act of 1926.

Endowments may be made to the Museum with the provision that an annuity be paid to the patron for life. These annuities are tax-free and are guaranteed against fluctuation in amount.

THE VAMPIRE BAT

By Colin C. Sanborn
Assistant Curator of Mammals

Ever since the discovery of the vampire bat by the Spanish invaders of the New World there have been incredulous stories told about its habits. Many of these tales persist to the present day. It is only natural, of course, that they should grow up around an animal which lives by sucking blood from animals and men.

Belief in human vampires—the spirits of dead and living persons who were said to suck the blood of people at night—was very strong in Russia and Poland, and among the Slavonic races of Austria from 1730 to 1735. It was undoubtedly this widespread superstition which caused Buffon, about 1750, to name the bloodsucking bat the vampire.

As Buffon named the bat from descriptions and stories by other men it was some time before it was known exactly which bat had the bloodsucking habits, and many of the fruit-eating species were suspected, probably on account of their size. The true culprit was discovered by Charles Darwin while on the voyage of the *Beagle* in 1832. For some time previously the tales about bloodsucking bats had been regarded with skepticism in England. Since Darwin's discovery, two other bats, much rarer than the common vampire, have been identified with bloodsucking habits.

The vampires are small, being about three inches long, and have but twenty teeth, the fewest found in any bat. They have very sharp incisors which make a small wound in the skin of their victim. Their bite is not deep, the blood being taken from the capillary vessels of the skin. The bats have a very narrow gullet and a digestive system otherwise especially adapted for a diet of blood.

Human victims of the vampires are seldom awakened by the attacks and, in spite of what has been written to the contrary, animals do not appear conscious of the bites. Poultry suffer from attacks made on their combs.

Reports of the effects of the attacks on humans vary greatly, and one is forced to the conclusion that much depends on the individual bitten. In extreme cases a great deal of blood may be lost and the victim may feel weakened. The great danger to animals is in the continued attacks and from flies that deposit their eggs in the wounds and cause infection.

Protection against bats is much easier than against mosquitoes, and in some places lights are placed in barns to protect domestic animals. A few years ago, while in Brazil as a member of the Marshall Field South American Expedition, I found that by tying my horses to a picket line and hanging a powerful gasoline lantern over them, they were safe from the bats.

The true vampire bats are found from Mexico south to central South America. There are bats in other parts of the world called vampires but they do not have bloodsucking habits.

At present the only bats exhibited at the Museum are the harmless ones of the Chicago area, but an exhibit of other species, including the vampire, is planned.

African Clairvoyancy

When one considers that even some educated people are unable to resist fortune tellers and similar charlatans, it is not surprising that primitive man strives to peer into the future. In Africa many methods are followed; for example, throwing bones and noting their arrangement when they fall; writing in the sand; examining the entrails of animals; and shaking a divination basket.

In Case 22, Hall D, is such a basket used by the Ovimbundu of Angola. This kind of divinatory apparatus is still employed, and two of the baskets from Angola are among the material collected by the Frederick H. Rawson–Field Museum Ethnological Expedition in 1929.

To the accompaniment of a friction drum the diviner shakes his basket, then pauses to observe what trinkets have come to the top. Two little wooden figures with their mouths close together may appear prominently. At once the diviner says that two people are whispering, plotting to kill by poison. A round piece of wood comes to the top. This is an open human mouth; someone, probably a woman, has been gossiping too freely. A little wooden snake appears at the top—the limbs of some unfortunate person will be twisted with pain. So the forecast proceeds with remedies suggested by the diviner.—W.D.H.

Report of Director Printed

The Annual Report of the Director of Field Museum to the Board of Trustees for 1932 has been printed by Field Museum Press, and copies will be distributed to all Members of the Museum at an early date. In the book, which contains 141 pages and nine photogravure plates, Director Stephen C. Simms reviews in detail all activities carried on during the year by the institution.

Traces of Glacial Period Iceberg

A large specimen of glaciated sandstone in Clarence Buckingham Hall (Hall 35) shows on its surface, besides the usual glacial striations, other markings made by a nearly stranded iceberg of the glacial period. These are scratches and gouges which cross the surface as interrupted lines. They were made by the cutting action of boulders imbedded in the bottom of the berg. When the slowly moving berg fell in the trough of a wave these boulders dragged across the rock and cut a line which was interrupted whenever the berg lifted to the crest of a wave.

Hopi Textiles

The Pueblo Indians of the Southwest have cultivated cotton for more than fifteen hundred years. At present, the Hopi of northeastern Arizona are the only American Indians who still grow it. Cotton was and is used for ceremonial robes, kilts, scarfs, sashes, and belts. After the white colonists introduced sheep into the country, the Hopi began to weave blankets from wool obtained from their own flocks.

In Hall 7, examples of Hopi textiles, both cotton and wool, are on exhibition.

Persimmons

The persimmons form a small family of tropical and subtropical trees and shrubs, especially numerous in Indo-Malaya, but also found elsewhere in both hemispheres. Several are cultivated for their edible fruits and some are esteemed for their black heart wood, ebony.

A fruiting branch of the wild persimmon of the southern United States, also various products of the persimmon family, are shown in the Hall of Plant Life (Hall 29), and the principal kinds of ebony may be seen in the Hall of Foreign Woods (Hall 27).

AMERICAN SONG BIRDS

A new exhibit of North American song birds has been installed in Hall 21. About one hundred species of flycatchers, wrens, thrashers, jays, swallows, etc., are shown, including all the species belonging to these families that occur on this continent north of Mexico. One of the most interesting is the vermilion flycatcher from the deserts of the southwest, which makes its living as other flycatchers do while clothed in the brilliant plumage of a tanager. Also shown are the violet green swallow which has the same iridescent colors in its plumage as oil film on water; Leconte's thrasher from the desert, which is one of the birds most perfectly adapted to living on dazzling sand under a bright sun; and many species of jays and magpies whose blue, green, black and white feathers make a pleasing contrast to their more somberly colored cousins, the crows and titmice. Birds in the exhibit which are seen in the state of Illinois are especially marked with a red star.

The birds were mounted by Taxidermist Ashley Hine, of the Museum staff.

TOBACCO PLANT EXHIBITED

By B. E. Dahlgren
Acting Curator, Department of Botany

Tobacco is of American origin. The earliest mention of it was made by Columbus and the first description of the plant and its use was that of Romano Pane, a monk who accompanied Columbus on his second voyage. He described how the Indians made a roll of the dry leaf, lighted it at one end, and, holding the other in the mouth, puffed clouds of smoke which, he supposed, were intended to drive away mosquitoes. Such cigar-like rolls, enveloped in corn husk, the inhabitants called *tabaco* and this Carib word has passed practically unaltered into the vocabularies of all western peoples.

Seeds of tobacco were carried to Spain where the plant was grown as a curiosity and as a remedy of great repute. It was called "herba santa," "herba panacea," and "divine tobacco." Soon afterwards it was introduced into France by Jean Nicot, the French ambassador to Lisbon, whose name has been given to the genus, *Nicotiana*, to which tobacco belongs, and thence to nicotine.

It did not take long for mariners, and settlers in the New World, to adopt the use of tobacco, and its cultivation was undertaken by Spaniards in Haiti, Portuguese in Brazil, and Englishmen in Virginia.

Smoking was introduced into Spain by sailors in 1570, and into England from Virginia soon afterwards. It did not become prevalent until the beginning of the seventeenth century. The cultivation of tobacco was begun in Holland in 1615 and afterwards in other European and in Asiatic countries.

Use of the herb for narcotic purposes encountered great opposition, especially from the church, and in several places severe penalties were imposed. In Russia it was forbidden on pain of slitting the nostrils of offenders, and later even of death. The herb was officially and ecclesiastically cursed in various countries as being unclean and an invention of the devil.

The denunciations and prohibitions, however, were ineffective, and the popularity of the "detestable" smoke of the North American Indians and the snuff of the South American tribes rapidly became almost universal. Asiatic smokers began to mix tobacco with their hemp. The Chinese quickly became devotees of the weed. The economic aspect of the trade in tobacco grew in importance and has steadily continued to grow. Tobacco now forms an important part of the agricultural production of many lands, especially the United States.

The tobacco plant is a member of the nightshade family which includes such food plants as potatoes, tomatoes and pimentoes, as well as various poisonous plants, such as

Tobacco Plant
Reproduction exhibited in Hall 28, prepared by Stanley Field Laboratories of the Museum.

datura, belladonna and hyoscyamus. The genus *Nicotiana*, typically and almost exclusively American, includes some forty-five species, many of which are attractive garden plants.

By far the greater part of the world's tobacco crop is derived from one species, *Nicotiana tabacum*, and its varieties such as Virginia and Turkish tobacco. Another species, known as Hungarian peasant tobacco, *Nicotiana rustica*, furnishes a part of the tobacco of Asia and South America. The Levantine cigar tobacco is said to be *Nicotiana crispa*.

A reproduction of a typical plant of the species *Nicotiana tabacum* in flower has been added to the Museum's exhibit of tobacco in Hall 28. It is the work of Emil Sella of the Stanley Field Plant Reproduction Laboratories.

Lacquer Ware from China

An exhibit of Chinese lacquer ware, including rare pieces hundreds of years old, some artistically carved, has been installed in George T. and Frances Gaylord Smith Hall (Hall 24). Among curiosities in the collection are sets of lacquer trays with pictures which serve as illustrations of ancient Chinese novels, and an elaborate picnic set of lacquer bowls and plates which fit into each other and into a small globe.

Field Museum's ethnological collection from Madagascar, in Hall E, is one of the most complete ever assembled.

WOOD CARVING WITHOUT METAL

By Albert B. Lewis
Assistant Curator of Melanesian Ethnology

Metal has become so necessary to our modern civilization that we find difficulty in imagining that mankind could ever have accomplished much without it. With the prehistoric stone ages we associate the cave man, and seldom think of him as possibly living, during the later periods, in well-constructed wooden houses, and making and using numerous wooden utensils of various kinds.

Yet proof that man is able to accomplish much without metals is found not only in remains of neolithic times, but also in the achievements of the natives of New Guinea and other South Pacific islands. Their large, finely carved houses and well-constructed seagoing canoes have been described by many early voyagers. Not only was the woodwork well done, but the decorative carving was often very elaborate, as, for example, in New Zealand and many Melanesian islands.

The superiority for woodworking of iron over stone, bone, tooth or shell, was speedily recognized by these peoples, and at the present time not much of the early work remains except from regions where the natives have acquired iron only recently.

In Joseph N. Field Hall (Hall A) there are many examples of such work, especially from the Admiralty Islands and New Guinea. The workmanship is equal, if not superior, to that done by the same people after they began to use iron, so that it is often difficult to tell from the specimens themselves what tools were used. All too frequently, however, the natives ceased their wooden manufactures after contact with Europeans, and the ancient art degenerated or disappeared in spite of better tools. The old artisans and artists died, and there were no younger ones to take their places.

Before the advent of metal tools, stone and shell axes and adzes of different sizes were common, and many examples can be seen in the Museum's exhibit. Stone or shell blades were fastened to straight handles and used as chisels. For smaller chisels bones were sometimes used. Many carving tools were made of teeth, either by using a portion of the jaw as a handle, or by setting them in a handle of wood. Boars' tusks were very commonly used in this way. The finer carvings were smoothed and polished with some rough substance such as a piece of shark's skin. Some of the best examples of the old work may be seen in the large circular wooden bowls from the Admiralty Islands, the wooden figures and masks from the Sepik River and the north coast of New Guinea, and the bowls and pillows from Huon Gulf.

Exhibit of Cork

Cork is obtained from the soft, spongy, and elastic bark of a stout, medium-sized oak tree (*Quercus suber*), native of southern Europe and northern Africa. As the tree grows the bark thickens and becomes firmer and denser. At certain periods of growth it falls naturally from the trees. For commercial purposes, however, it is removed, care being taken not to wound the inner bark or cambium layer. The outer matured bark is taken off in large sheets, soaked in water and then flattened by pressure. An exhibit in Hall 28 shows the entire bark of a cork oak as it appears when stripped from the tree trunk.

FILMS OF MAORI LIFE TO BE SHOWN MAY 6

"The Maori as He Was," an official motion picture made under the auspices of the Commonwealth of New Zealand, will be presented in a special showing in the James Simpson Theatre of Field Museum on Saturday afternoon, May 6, at 3 o'clock, as a supplement to the Spring Lecture Course which ended April 29. These films give an exceptionally fine exposition of the life of these primitive people and bear complete explanatory captions to tell their story. The many strange customs of the Maori, who are among the most interesting of aboriginal peoples, are vividly illustrated in these unique pictures.

Admission is free, and Members of the Museum are cordially invited to attend. No tickets are necessary. A section of the Theatre is reserved for Members of the Museum, each of whom is entitled to two reserved seats on request. Requests for these seats may be made by telephone or in writing to the Museum in advance, and seats will then be held in the Member's name until 3 o'clock on the day of the program. Members may obtain seats in the reserved section also by presentation of their *membership cards* to the Theatre attendant before 3 o'clock, even though no advance reservation has been made. All reserved seats not claimed by 3 o'clock will be opened to the general public.

PAPER-MAKING MATERIALS

By Llewelyn Williams
Assistant in Wood Technology

The papyrus of the Egyptians, from the name of which the word "paper" is derived, dates from the time of Alexander the Great, about 350 B.C. It was made from a tall, aquatic sedge. The central part of the stem was cut into thin slices, spread out, and moistened. On this a second layer was placed crosswise to form a sheet of convenient size. The Japanese to this day, by slicing the pith of the stem of an *Aralia*, produce a similar thin white sheet used as a "paper" for special purposes.

In Hall 28 there is exhibited a primitive outfit from Siam used for making paper by hand from Khoi bark. The equipment consists of a mallet for beating the bark into pulp, and a wooden frame covered with cloth. On this frame a mixture of pulp in water is carefully spread until a sufficient layer is deposited to form the thickness desired. A wooden roller is then passed over the pulp to squeeze out excess water, and the frame is set in the sun until the paper is sufficiently dry for removal.

The method of making paper by hand in other countries does not differ greatly from this, and, irrespective of raw material employed, the general process of modern paper-making, with all its refinements and use of machinery, remains similar in principle. By mechanical or chemical treatment, or both, the fibers are separated from each other and thoroughly beaten up with water into a cream-like pulp. This is run out in a thin, even layer on a screen of fine wire cloth. On drying, the solid matter, consisting of interlaced fibers, forms a sheet of paper.

Thus, paper is essentially a sort of felt made from vegetable fiber. Non-vegetable fillers may enter into the pulp, and the sheets may be variously treated or calendered by pressing between rollers or by sizing, but the quality of the paper depends mainly upon the fibrous material used. The most important kinds of plant material used for paper-making are shown in three cases in Hall 28.

The art of making paper from pulp originated in China more than 1,800 years ago, and gradually passed westward through the Mohammedan world into Europe. Towards the end of the eleventh century paper-makers of Spain began to use linen rags, and for a long time these were the principal material used in Europe. The earliest known paper-mill in America was established in 1690 at Roxburgh, near Philadelphia, on a stream known as Paper-mill Run, by William Rittinghuysen. He used linen rags as raw material.

The French physicist Réaumur (1683-1757) is said to have been the first to conceive the possibilities of producing paper from wood when he realized that the nest of the paper wasp consists of wood fiber. Today wood is the most commonly employed material, about 80 per cent of all paper produced in this country being made from it. Basswood was the first wood used in Europe, but eventually spruce became the leading pulp wood.

In the early years of the pulpwood industry the wood was simply cut and ground into pulp. It was soon discovered, however, that the separation of the wood elements could be aided by chemical means, and so-called chemical wood-pulp is now most commonly used. According to the chemical agent employed the three principal methods are known respectively as the sulphite, sulphate, and soda processes.

SPECIAL NOTICE

Members of the Museum who have changed residences or plan to do so are urged to notify the Museum of their new addresses, so that FIELD MUSEUM NEWS and other communications may reach them promptly.

Members going away during the summer, who desire Museum matter sent to their temporary addresses, may have this service by notifying the Museum.

Chinese Cloisonné Ware

An exhibit of rare Chinese cloisonné ware, some dating back as far as the thirteenth century, has been installed in George T. and Frances Gaylord Smith Hall (Hall 24). Included are some of the most beautiful and intricately designed pieces in existence, in the opinion of Dr. Berthold Laufer, Curator of Anthropology. Among these is a remarkable cloisonné enamel statue of the great religious dignitary Pal-dan Ye-she, known as the Tashi Lama of the Buddhist church of Tibet. This statue, made in the eighteenth century when cloisonné art was at its zenith in China, is a gift from Stanley Field, President of the Museum. A large and unusual jar of the fifteenth century, presented by Trustee William J. Chalmers, is another outstanding piece.

Other objects shown were obtained by the Blackstone Expedition to China. Some of the later examples illustrate the aptitude of Chinese artists in copying designs of French origin.

A beautiful model of the Taj Mahal is exhibited in Hall E.

Ornamental minerals constitute a special exhibit in the Department of Geology.

MAY GUIDE-LECTURE TOURS

Conducted tours of exhibits, under the guidance of staff lecturers, are made every afternoon at 3 P.M., except Saturdays, Sundays, and certain holidays. Following is the schedule of subjects and dates for May:

Week beginning May 1: Monday—Skeletons, Past and Present; Tuesday—Musical Instruments; Wednesday—Habitat Groups; Thursday—General Tour; Friday—China and Tibet.

Week beginning May 8: Monday—Peat, Coal and Oil; Tuesday—Snakes and Lizards; Wednesday—Rare Birds; Thursday—General Tour; Friday—Pewter and Jade.

Week beginning May 15: Monday—Egyptian Exhibits; Tuesday—Primitive Pottery; Wednesday—Animal Life of the Chicago Region; Thursday—General Tour; Friday—Masks.

Week beginning May 22: Monday—Work of Heat, Wind and Water; Tuesday—Hall of Prehistoric Life; Wednesday—Wood and Its Uses; Thursday—General Tour; Friday—The Story of Man.

Week beginning May 29: Monday—Animal Life of Eurasia; Tuesday—Memorial Day holiday, *no tour;* Wednesday—Hall of Plant Life.

Persons wishing to participate should apply at North Entrance. Tours are free and no gratuities are to be proffered. A new schedule will appear each month in Field Museum News. Guide-lecturers' services for special tours by parties of ten or more are available free of charge by arrangement with the Director a week in advance.

Gifts to the Museum

Following is a list of some of the principal gifts received during the last month:

From the Mengel Company—a board of Honduras mahogany; from Dr. Earl E. Sherff—160 herbarium specimens, Hawaiian Islands; from Dr. H. W. von Rozynski—348 herbarium specimens, Mexico; from Ichabod T. Williams and Sons—a board of Peruvian mahogany; from Museo Nacional—165 herbarium specimens, Costa Rica; from Crystal Fluorspar Company—a specimen of fluorite, Illinois; from James H. Quinn—13 specimens of Upper Miocene mammals, Nebraska; from L. S. Pyle—a specimen of *Orthoceras annulatum* in matrix, Illinois; from Walker Museum, University of Chicago—4 lizards, 2 turtles, and 16 skulls and 4 shells of land turtles, Galapagos Islands; from Museum of Comparative Zoology—an alligator, Florida; from Dr. Orlando Park—5 insects, Illinois, Louisiana, and New Mexico; from F. J. W. Schmidt—3 salamanders, 3 frogs, 3 snakes, and 12 lizards, Wisconsin; from Dr. Wilhelm Filchner—18 reels of motion pictures of Tibetan dancers.

NEW MEMBERS

The following persons were elected to membership in Field Museum during the period from March 16 to April 17:

Associate Members

Miss Jessie Colvin, Mrs. Henry K. Friend, Rudolph F. Kelker, Jr., William Reach, Marcus D. Richards.

Annual Members

Mrs. George Adams, George G. Arnold, H. H. Bryan, F. D. Carpenter, Fred Y. Coffin, Robert Cunningham, William S. Deree, Mrs. Arnold Epstein, Mrs. H. B. Erminger, Jr., Mrs. Sol. H. Goldberg, Mrs. T. R. Gowenlock, Mrs. O'Bannon L. Huffaker, George D. Ladd, Mrs. Herbert Ross Landes, Miss Mary J. Lawson, Herman J. Mayer, Jr., Mrs. V. C. Sanborn, Miss H. Gertrude Strain.

Origin of Henna

Henna is derived from the leaves of a shrub, the sweet-smelling camphire of Solomon (*Lawsonia alba*) of the loosestrife family (Lythraceae). It is cultivated extensively in the Orient, and the ground leaves form an article of commerce for use as a dye and cosmetic. In ancient Egypt it was employed for staining the finger nails and throughout the centuries it has retained its popularity as a hair dye. It is one of the vegetable dyes shown in Hall 28.

Activities of the James Nelson and Anna Louise Raymond Foundation of the Museum are benefiting more than 250,000 children annually.

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HALL OF THE RACES OF MANKIND (CHAUNCEY KEEP MEMORIAL) OPENS JUNE 6

By Berthold Laufer
Curator, Department of Anthropology

Chauncey Keep Memorial Hall, which will be opened to the public on June 6, contains a series of statues, busts, and heads of bronze (with the exception of four which are of stone) by Malvina Hoffman, sculptor of international fame, intended to illustrate the principal racial types of the human species and depict their physical characteristics. This hall, unique among the museums of the world, is named in honor of the late Chauncey Keep, a highly esteemed member of the Museum's Board of Trustees from 1915 until his death in 1929. A legacy of $50,000 which he left to the Museum has been applied to the hall and its contents, and the balance of the cost has been met by generous contributions, totaling more than $150,000, from Marshall Field, Mrs. Stanley Field, and Mrs. Charles H. Schweppe.

Chauncey Keep

Blackfoot Indian

In the carrying out of its novel idea, Chauncey Keep Memorial Hall required special treatment, and new resources of museum technique had to be developed. A great deal of construction work had to be undertaken, alcoves built to provide a suitable setting for the bronzes, and careful studies made for the purpose of giving them the best possible display and lighting. Both in the formulation of the plan and in the solution of the many complex problems connected with the work, President Stanley Field has spent much of his time and energy, and has to a considerable degree contributed to the success of the hall. The plan was carried out after long and mature deliberation; as a matter of fact, its inception goes back to the year 1915 when it was first mapped out in the Department of Anthropology. In the course of years it was frequently modified and improved, and finally brought to fruition with the cooperation of Henry Field, Assistant Curator of Physical Anthropology.

Samoan

The hall is divided into three sections, the central one being an octagon. The material is distributed by continents in geographical order. The section on the west side of the hall contains the races of Africa and Oceania; the octagonal section in the center is devoted to the races of Europe, Asia, and America, those of Asia being continued in the section on the east side. The center of the octagon is occupied by a monumental bronze group symbolizing the unity of mankind. It consists of a white, a yellow, and a black man of heroic size representing the three principal racial divisions. Each figure embodies the highest qualities of the race.

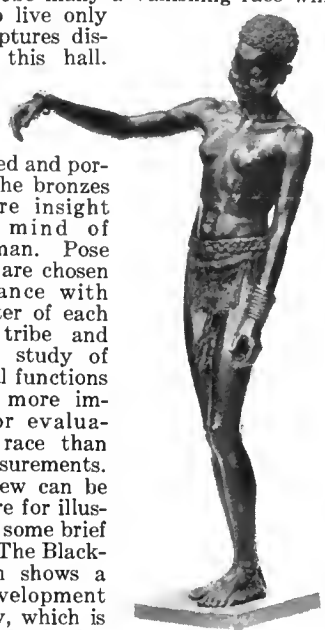
Mongol

More bronzes will be added to the hall from time to time; also, colored transparencies of racial types will be installed, and special exhibits of a scientific character will be arranged at the east end.

Each sculpture is the result of careful selection of subject and long anthropological study. Malvina Hoffman was sent by the Museum on an expedition to Asia, visiting Japan, China, Java, Bali, Sumatra, the jungles of the Malay Peninsula, Ceylon, and India, studying racial types and modeling her subjects directly from life in clay; from clay they were transformed into plaster and finally cast in bronze. As far as possible, the patina of the bronze has been finished in conformity with the skin color of the race.

Mangbetu Woman

Because of the rapid extinction of primitive man due to the white man's expansion over the globe many a vanishing race will continue to live only in the sculptures displayed in this hall. Both the racial and the individual character is grasped and portrayed in the bronzes with a rare insight into the mind of primitive man. Pose and action are chosen in consonance with the character of each particular tribe and permit the study of the physical functions which are more important for evaluation of a race than bodily measurements.



Sara Dancing Girl

Only a few can be selected here for illustration and some brief comment. The Blackfoot Indian shows a perfect development of the body, which is intense with health and vigor; he is signaling to his friends in the distance that he has hit his quarry. The Samoan is a fine example of Polynesian stock.

The graceful, fifteen-year-old dancer of the Sara tribe and the Mangbetu woman from the Belgian Congo well represent Negro types of beauty. The portrait bust of a powerful Mongol evokes memories of the Mongol empire, greatest in history.

Ainu

One of the most attractive figures is that of a middle-aged Ainu, full of dignity and poise, an eloquent spokesman of the once glorious past and subsequent tragedy of his vanishing race. In a prehistoric age the Ainu were the original inhabitants of the Japanese islands. Clashing for centuries with the Japanese who were migrating from southeastern Asia, the Ainu finally yielded to forces superior in number, retreating into the northern island of Yezo.

Field Museum of Natural History

Founded by Marshall Field, 1893

Roosevelt Road and Lake Michigan, Chicago

FIELD MUSEUM NEWS

STEPHEN C. SIMMS, *Director of the Museum*.....*Editor*

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OLIVER C. FARRINGTON.....*Curator of Geology*
WILFRED H. OSGOOD.....*Curator of Zoology*

H. B. HARTE.....*Managing Editor*

Field Museum is open every day of the year during the hours indicated below:

November, December, January 9 A.M. to 4:30 P.M.
February, March, April, October 9 A.M. to 5:00 P.M.
May, June, July, August, September 9 A.M. to 6:00 P.M.

Admission is free to Members on all days. Other adults are admitted free on Thursdays, Saturdays and Sundays; non-members pay 25 cents on other days. Children are admitted free on all days. Students and faculty members of educational institutions are admitted free any day upon presentation of credentials.

The Museum's natural history Library is open for reference daily except Saturday afternoon and Sunday.

Traveling exhibits are circulated in the schools of Chicago by the N. W. Harris Public School Extension Department of the Museum.

Lectures for schools, and special entertainments and tours for children at the Museum, are provided by the James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures.

Announcements of free illustrated lectures for the public, and special lectures for Members of the Museum, will appear in FIELD MUSEUM NEWS.

A cafeteria in the Museum serves visitors. Rooms are provided for those bringing their lunches.

Chicago Motor Coach Company No. 26 buses go direct to the Museum.

Members are requested to inform the Museum promptly of changes of address.

MEMBERSHIP IN FIELD MUSEUM

Field Museum has several classes of Members. Benefactors give or devise $100,000 or more. Contributors give or devise $1,000 to $100,000. Life Members give $500; Non-Resident Life and Associate Members pay $100; Non-Resident Associate Members pay $50. All the above classes are exempt from dues. Sustaining Members contribute $25 annually. After six years they become Associate Members. Annual Members contribute $10 annually. Other memberships are Corporate, Honorary, Patron, and Corresponding, additions under these classifications being made by special action of the Board of Trustees.

Each Member, in all classes, is entitled to free admission to the Museum for himself, his family and house guests, and to two reserved seats for Museum lectures provided for Members. Subscription to FIELD MUSEUM NEWS is included with all memberships. The courtesies of every museum of note in the United States and Canada are extended to all Members of Field Museum. A Member may give his personal card to non-residents of Chicago, upon presentation of which they will be admitted to the Museum without charge. Further information about memberships wil be sent on request.

BEQUESTS AND ENDOWMENTS

Bequests to Field Museum of Natural History may be made in securities, money, books or collections. They may, if desired, take the form of a memorial to a person or cause, named by the giver.

Cash contributions made within the taxable year not exceeding 15 per cent of the taxpayer's net income are allowable as deductions in computing net income under Article 251 of Regulation 69 relating to the income tax under the Revenue Act of 1926.

Endowments may be made to the Museum with the provision that an annuity be paid to the patron for life. These annuities are tax-free and are guaranteed against fluctuation in amount.

THE MUSEUM HERBARIUM

By PAUL C. STANDLEY
Associate Curator of the Herbarium

When the press announces that Field Museum has acquired an important collection of plants, interested persons often visit the Museum expecting to see a display of living plants. Unfortunately, such collections usually consist of pressed and dried specimens, dreary enough to the uninitiated, but a joy to botanists studying the relationships of the plants of the world.

While it would be impracticable to collect living individuals of the several hundred thousand different flowering plants that inhabit the earth, it is possible to assemble in relatively small compass dried specimens, although no museum can boast a representation of all the plants that are known. For study, such dried plants are almost as useful as living ones. Small herbs can be preserved entire, and even the largest trees can be adequately represented by leafy branches or twigs, flowers, and fruits. Properly dried herbarium specimens often exhibit accurately even the colors of delicate flowers. To study the internal structure of smaller flowers, dried ones may be soaked in water, whereupon they resume some semblance of their original form.

The dried specimens are attached with glue and strips of adhesive plaster to heavy sheets of paper (11x16 inches), and labeled with their geographic origin, collector, date of collection, color of flowers, and other information. Placed in protective covers, these sheets are arranged by genera and families, making it possible to locate quickly any plant represented.

Often it is asked how long such dried plant specimens will last. If properly protected from dust, insects, and careless handling, they should last indefinitely. Wreaths of flowers and foliage placed in Egyptian tombs three or four thousand years ago are still perfectly preserved, some in as good condition as specimens dried only ten years ago. Herbaria of Europe possess specimens three centuries old, which still retain their natural colors.

As Field Museum was founded only forty years ago, its Herbarium consists chiefly of recent collections, but from older institutions it has acquired many specimens more than a century old. The Herbarium, consisting of 660,000 mounted sheets of plants, fills a large hall on the third floor of the Museum. Every country of the globe is represented by specimens of its plants.

The Herbarium is particularly rich in plants of the United States, Mexico, the West Indies, and the Andes of South America. The floras of Peru and the Yucatan Peninsula are illustrated here more completely than in any other museum of the world, largely because of exploration conducted by Field Museum in those areas. There is maintained, also, a special herbarium of Illinois plants, their segregation making them more easily accessible to those interested primarily in the flora of the state and the Chicago area.

The Herbarium is used constantly by the staff of the Department of Botany and others, for reference in the determination of specimens and as a basis for the preparation of monographs and floras.

Specimens are often lent for study to botanists in other parts of the United States and in Europe, and the Herbarium is visited frequently by botanists of other cities. Although there are several large herbaria in the United States, there is no other within several hundred miles of Chicago, hence the great utility of one placed in so central a location.

European herbaria possess thousands of type or historic specimens upon which were based the earliest descriptions and the Latin names of American plants. Since in classification and naming of plants it is important to have access to these specimens for comparison, Field Museum, with the aid of a grant from the Rockefeller Foundation, has engaged in photographing some thousands of them. In this work it has had the cooperation of the European herbaria. Such photographs often serve for study almost as well as the specimens. Field Museum has thus acquired representation of probably more South American plants than any other museum of the United States. Since South America, with its vast unexplored areas, is the region in which American botanists are most intensely interested, Field Museum has an enviable equipment for current work in systematic botany. As a result, it receives large additions to its tropical American collections, presented by collectors to be named by comparison with the authentic material here available for the purpose.

"MINERAL MOONLIGHT"

By HENRY W. NICHOLS
Associate Curator of Geology

Owing to their exceptional size and beauty, two selenite crystals have been given a case by themselves in the mineral collection in Hall 34. These crystals have the form of prismatic columns about twenty inches high. They are transparent and have a soft luster which suggests moonlight. This luster is like that of the selenite column in the fabled temple of the oracle of the "Dives Bouteille" which Rabelais said has "a splendor like that of Hymettian honey."

The suggestion of moonlight in the luster of selenite has been recognized from remote antiquity. The Chaldean astrologers attributed selenite to the moon. The Greeks named the mineral "selenites," which means "belonging to the moon."

Selenite is the pure, transparent form of the common mineral, gypsum, which in its ordinary occurrence is a common-looking rock used for making plaster of paris. So attractive a mineral should find use as an ornamental stone, but selenite is far too soft and easily marred for such use. It can be scratched easily by the finger nail. The attractive luster is lost when the crystal is cut in certain directions and it is difficult to cut without opening cracks, owing to a strongly developed cleavage. Two other varieties of gypsum, alabaster and satinspar, although equally soft, are used for ornament. These are not transparent, so that marring on account of their softness is not so readily seen.

The exhibited crystals grew in a cave in the Braden Copper Mine in Chile, a mine dug in the crater of a volcano which is probably extinct. They were collected by the Marshall Field Brazilian Expedition of 1926.

Completing Stone Age Hall

Frederick Blaschke of Cold Spring-on-Hudson, New York, the sculptor commissioned to prepare the restorations of prehistoric peoples for the Hall of the Stone Age of the Old World (Hall C), arrived at the Museum in May, bringing with him the various figures for the groups. Mr. Blaschke is now working upon the installation of this hall which, it is expected, will be completed in a few weeks.

NEW LION GROUP: COLLECTED BY MR. AND MRS. MARSHALL FIELD

By Wilfred H. Osgood
Curator, Department of Zoology

It might be expected that a group of typical lions would be one of the first exhibits to be obtained for the Museum's hall of African mammals. The very fact of the animal's importance, however, and the exacting requirements made as to the quality of the material to be used have heretofore operated for postponement. For some years the lion has been represented in the Museum only by an individual specimen among the systematic collections in Hall 15, and by a group of two maneless males—the famous man-eating lions of Tsavo which are reputed to have killed and devoured 135 native laborers during the construction of the Uganda railroad. While the Tsavo lions are thus of great interest, they are not thoroughly characteristic of *Felis leo*.

It has remained for Mr. and Mrs. Marshall Field to provide specimens which do justice to the "king of beasts," and these have now been prepared in a striking group displayed in Carl E. Akeley Memorial Hall (Hall 22). They were secured during the trip which Mr. and Mrs. Field made by air to central Africa in 1930.

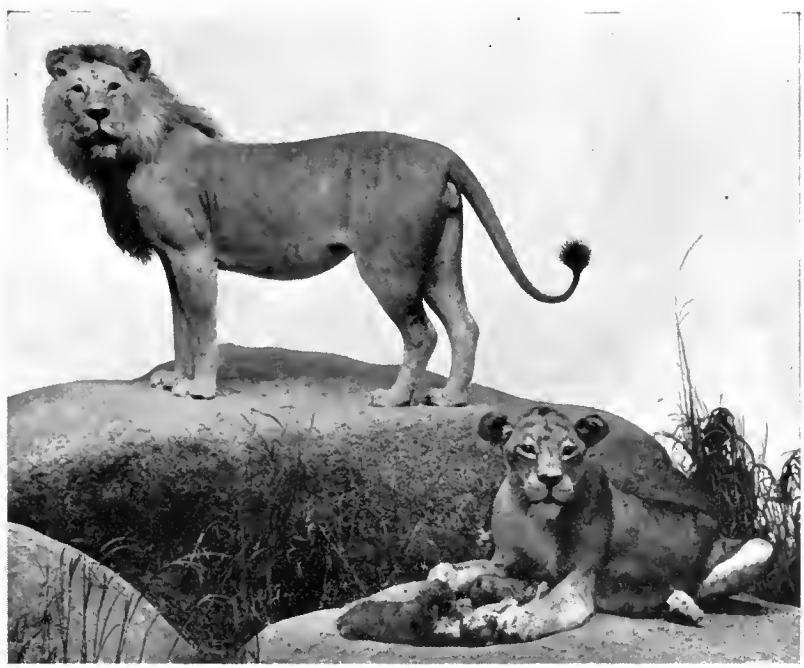
The group includes an exceptionally large male lion shot by Mr. Field, an equally fine lioness shot by Mrs. Field, and four small kittens. The composition is simple but impressive and characteristic. The male stands at attention on the smooth surface of a rocky eminence and the female lies peacefully below, while the kittens, so young their eyes are barely open, are gathered between her paws. The rocky setting illustrates the well-known habitat of lions in the Serengetti Plains of Tanganyika, where the animals were killed.

Popular conception of the lion is based on the lion of the zoo, of the moving picture and also, it must be said, of sculpture and heraldry. This lion is quite different from the wild one, which never has such a heavy mane as the captive one, and which is more lithe in general form. Therefore, this faithful representation of the monarch and his family as they appear in the natural state may not fulfill general expectations. To the naturalist and the hunter, however, the lion is rarely disappointing and it is universally granted that he deserves his far-flung reputation for dignified appearance and commanding disposition. He is conceded to be one of the most dangerous of all animals to hunt and, although he has learned to avoid man, he is bold and aggressive in attacking him when provoked. Many hunters have been killed or seriously mauled by lions.

There is only one species of lion, although several minor geographic varieties can be distinguished. Within historic times lions inhabited eastern Europe, Persia and India, but now they are practically confined to Africa. A few remain in the Gir Forest of western India, but their continued existence there depends upon careful protection.

The male lion in the Museum's group has a length of nine feet seven inches, which is large enough to be worthy of mention in a book of records, since the maximum figures rarely exceed ten feet. Weights up to 500 pounds are claimed in some cases, but these are exceptional.

The group was designed and prepared by Staff Taxidermist C. J. Albrecht, who brought to his task a field experience with lions, gained while a member of the Harold White–John Coats African Expedition of 1929–30.



Monarchs of the Animal Kingdom

New group of lions in Carl E. Akeley Memorial Hall. These excellent specimens were collected by Mr. and Mrs. Marshall Field.

A SOUTH SEA HALL OF FAME

A peculiar illustration of the general desire of mankind to keep at hand some relic or reminder of the great who have departed may be seen in Joseph N. Field Hall (Hall A).

In southern Malekula, one of the New Hebrides Islands, the natives model on the skull of a deceased important man of the community his face and features. This is done with a plastic mass made of coconut fiber, clay, and a gummy sap. The aim is to make this a real portrait, and often the man's hair is attached to the top and back. The face is painted with designs indicating the man's rank. These heads are placed on the tops of carved posts and kept in the men's clubhouse.

If the man is of very high rank, a body is also often made out of bamboo sticks and leaves, covered with the same plastic mass, and painted with the proper designs. The head is attached to this body. One such figure and several of the portrait heads are on exhibition at the Museum.—A.B.L.

The insect-catching plant known as Venus' fly trap makes an interesting exhibit in the Hall of Plant Life.

Products from forty different plants go into the making of Indian curry powder. The raw ingredients are displayed in the Department of Botany.

HOW PANAMA HATS ARE MADE SHOWN IN EXHIBIT

By Llewelyn Williams
Assistant in Wood Technology

Popular materials for making hats are obtained from the stems of reeds, rushes or grasses, palm leaves, coarse tree basts, etc. Straw plaits made from wheat, rye, barley and rice straw furnish material for the greater part of the summer hats manufactured for wear in the temperate zone. Splints prepared from finely divided leaves of palms and allied forms of vegetation are also widely utilized. In the Orient splints of bamboo are commonly used. Manila hemp, from the leaf sheaths of a non-edible banana (*Musa textilis*), is also employed for this purpose. Screw pine leaves, cut into strips, also provide material. Within recent years manufactured cellulose material has come into use as a substitute for natural straw.

An exhibit installed in Hall 28 shows the various steps in the manufacture of Panama hats, as well as a series of hats made from different plant materials in China, Java, Philippine Islands, India, and Brazil, and one made by North American Indians of Alaska.

The material used for making genuine Panama hats is obtained from the young, unopened leaves, which have not yet developed green color, of the so-called Panama hat palm (*Carludovica palmata*), occurring in northwestern South America. The folded leaf lamina is cut into fine splints or strips of uniform width. These are boiled in water, hung up in an airy place to dry, and then bleached in the sun. For plaiting, the splints are moistened, but throughout the subsequent operations they are guarded from the sun in order to preserve the moisture and to prevent unequal bleaching.

The manufacture of Panama hats is the principal industry of certain regions in Ecuador, Colombia and northeastern Peru. Formerly these hats reached the market by way of the Isthmus of Panama, whence comes the name that still erroneously attaches to them. Leghorn hats are made from the upper and finer portions of wheat straw grown for the purpose in Tuscany, Italy. They are woven by hand into hat shape and then stiffened with gelatin.

Death of Dr. W. H. Holmes

News of the death of Dr. William Henry Holmes on April 20 was received at Field Museum with keen regret. Dr. Holmes was the first Curator of Anthropology at this institution, having joined the staff in 1894 and served for several years. Later he became successively head curator of anthropology of the United States National Museum, and director of the National Art Gallery in Washington. He was eighty-six years old at the time of his death.

Suits of armor, cannon, and other weapons of the Moro tribes of the Philippines are included among the exhibits in Hall H.

THE EXHIBIT OF FOSSIL SLOTHS

By Elmer S. Riggs
Associate Curator of Paleontology

In Ernest R. Graham Hall (Hall 38) a collection of skulls of fossil sloths, representing almost every branch of the family, was recently installed. Some are only a few thousand years old; others are from animals that lived thirty million years ago. Most of these specimens were collected by two Marshall Field Paleontological Expeditions to South America.

The sloths are one of the oldest families of South American mammals. Some lived in trees, as do modern sloths which still survive in the Amazon forests. The greater number, however, lived upon the ground, and all of the ground sloths are extinct.

The earliest sloth represented in this collection was about as large as the common badger. It lived during the Oligocene period in swamp lands in the region which is now southern Argentina. Six of the smaller specimens are skulls of sloths that lived in the next later period, the Miocene. They were found along the Atlantic coast of Argentina where the sea is steadily cutting away the plains and exposing fossils more abundantly. Some of these were apparently tree-sloths; others were larger and had probably acquired the habits of ground-sloths.

Specimens from the next later geological period, the Pliocene, were found in northern Argentina where hardened ledges of sandstone, in steep cliffs, crop out along the valleys of streams. Among fossil animals of many kinds are found here the remains of larger and more recent sloths. Three specimens in the exhibited series belong to this period, seven million years ago. The two continents of America had by this time joined at the isthmus, and sloths and other land animals had found a way to move northward by that route to new territory.

Seven of the larger specimens in this collection are skulls of sloths which lived during the last geological period extending back one million years. These animals varied in size from that of a hippopotamus to that of an elephant. Four of the specimens are from a valley in southern Bolivia where they had been covered by sediments washed down from the mountains. Three others are from the famous pampa formation of central Argentina consisting of low, flat lands, often overflowed by rivers. As these streams later cut their channels deeper and wider through the accumulated sands and clays, the fossils were laid bare.

A single specimen in this series represents one of the various species of sloths which migrated northward and found a home in California. This one is from the famous "asphaltum pools" of Rancho la Brea near Los Angeles. There the animal had wandered into a trap set by nature, floundered and sunk into the tar-filled pool, and had been preserved as a fossil by the tarry mass.

The sloths were all plant-eaters. They reared upon their stout hind legs, pulled down branches of bushes and trees, and fed upon the leaves and fruit. A group near the serial collection shows an articulated ground-sloth skeleton in position for feeding in this way. A second skeleton in the group is postured to use the great, hooked claws of the fore foot to dig in the ground for roots and tubers.

The life and religious practices of the Potawatomi Indians, who formerly inhabited the Chicago region, are illustrated by exhibits in the Department of Anthropology.

No Parking During Exposition

Under regulations made by the South Park Commissioners to avoid congestion of traffic, there will be no parking of automobiles permitted in the vicinity of Field Museum or other institutions in Grant Park during the period of A Century of Progress exposition.

THE WOLF HERRING

By Alfred C. Weed
Assistant Curator of Fishes

Nearly all members of the great group of herring-like fishes are small, delicate creatures, whose mission in life seems to be to provide other inhabitants of the sea, and mankind, with food. Man, mammals, birds and fish all take heavy toll of the immense schools of herring, sprats, anchovies and whitebait. Fishermen spend fortunes in preparing gear to catch fish so small that it takes dozens of them to fill an ordinary teacup. However, there are larger forms, and the range in size between a whitebait an inch or so in length and a tarpon that weighs three hundred pounds is very impressive. Many of these larger species spend much of their time seeking their own smaller relatives, to devour them.

In the warm waters of the Red Sea, Indian Ocean and eastward through most of the tropical islands of the Pacific we find a large herring-like fish called "dorab" by the Arabs. Native fishermen give it various names in their own languages. English-speaking people usually call it by the native name most familiar to them. A few writers from Australia have called it "wolf herring," a name well suited to the fish.

This fish is much like a herring in general appearance, except that it is much longer for its width and height. The head is like that of a herring, but tips upward until the lower jaw is almost vertical. The mouth is filled with sharp, strong fangs so long that the mouth can hardly be closed far enough to hide them. The mouth is so nearly vertical that the chin is part of the top of the head.

The wolf herring, like our bluefish, is a strong, swift swimmer, living in the open sea, mostly not far from shore. Its food is found in the schools of small herring-like fishes, which it follows as the bluefish follows the schools of sardines and menhaden.

Although this fish has been well known to scientists for years, little has been published about its habits. Many writers have had something to say about its value as food. Some consider it good while others say that only the lowest classes of people eat it at all. In most places it seems to be taken only accidentally in fishing for other species. One author reported that there was, in his time, a fishery for it in the Red Sea.

Not much is known about the size to which this fish grows. The older writers thought it reached a length of twelve feet and that size has been quoted by some recent authors. As we come to more recent writings we find one man who says, "Individuals of six feet in length are at Pinang of rare occurrence." Still more recently writers say that they have seldom seen one more than three feet long. Even one that size on light tackle should be as sporting a fish as our bluefish.

A celluloid reproduction of a wolf herring has been prepared by Staff Taxidermist A. G. Rueckert from specimens collected by various expeditions to the Pacific and is now on exhibition in Albert W. Harris Hall (Hall 18).

JUNE GUIDE-LECTURE TOURS

Conducted tours of exhibits, under the guidance of staff lecturers, are made every afternoon at 3 P.M., except Saturdays, Sundays, and certain holidays. Following is the schedule of subjects and dates for June:

Thursday, June 1—General Tour; Friday—Pewter, Jade and Gems.

Week beginning June 5: Monday—Peat, Coal and Iron; Tuesday—General Tour; Wednesday—Egyptian Hall; Thursday—General Tour; Friday—Plant Life.

Week beginning June 12: Monday—Birds of Many Lands; Tuesday—General Tour; Wednesday—Chinese Exhibits; Thursday—General Tour; Friday—Prehistoric Life.

Week beginning June 19: Monday—Indians and Eskimos; Tuesday—General Tour; Wednesday—Trees and Wood Products; Thursday—General Tour; Friday—American Archaeology.

Week beginning June 26: Monday—Moon, Meteorites and Minerals; Tuesday—General Tour; Wednesday—Animal Groups; Thursday—General Tour; Friday—Reptiles, Past and Present.

Persons wishing to participate should apply at North Entrance. Tours are free and no gratuities are to be proffered. A new schedule will appear each month in Field Museum News. Guide-lecturers' services for special tours by parties of ten or more are available free of charge by arrangement with the Director a week in advance.

Gifts to the Museum

Following is a list of some of the principal gifts received during the last month:

From Mrs. William H. Moore—15 metal mirrors and other archaeological material, China; from Miss Lucy D. Plummer—13 specimens of glazed and painted pottery of Chama Indians, Peru; from Companhia Ford Industrial do Brasil—25 herbarium specimens with accompanying wood specimens, Brazil; from Emilio Kauffmann—trunk of a rubber tree, lower Brazilian Amazon; from William A. Schipp—204 herbarium specimens, British Honduras; from Dr. B. E. Dahlgren—210 herbarium specimens, Brazil; from Universitetets Botaniske Museum, Norway—474 duplicate and fragmentary herbarium specimens, Ecuador; from School of Forestry, Yale University—71 herbarium specimens, Colombia; from Herbert C. Walther—4 specimens of rare elements, Kansas and California; from Ernest E. Halvorsen—a specimen of calcareous tufa and a Yokuts stone mortar, California; from L. H. Phillips—402 insects, Philippine Islands; from Jonathan Williams—2 specimens of Graham's water snake, Illinois; from J. A. Sanchez Antunano—2 bobwhite skins; from Dr. Charles E. Burt—53 specimens of frogs, snakes, and lizards; from Mrs. Henry Birkholz—a long-tailed shrew, Indiana.

NEW MEMBERS

The following persons were elected to membership in Field Museum during the period from April 18 to May 15:

Associate Members

Mrs. J. Russell Forgan, Mrs. William A. Nitze, John W. O'Leary, Mrs. R. J. Raney.

Annual Members

Mrs. William Grant Agar, William L. Ayers, John A. Carter, Jr., Samuel A. Ettelson, Joseph R. Gibson, J. M. Hall, Mrs. Frank K. Hoover, J. S. Jordan, Joseph P. Langford, Thomas B. Lantry, Mrs. Roswell C. Mower, Miss Sara A. Randick, Mrs. Helen Schymanski, J. G. Smithwick, William L. Stensgaard, Mrs. Martin Strand, Miss Victoria Warnesson, Morton Weinress, Mrs. H. Gideon Wells.

New Britain Canoe Ornaments

Interesting examples of the care and skill exercised in their work by the South Sea designers and artisans are the prow and stern ornaments of a ceremonial canoe from New Britain on exhibition in Joseph N. Field Hall (Hall A). The two together nearly fill one side of a case. Each is carved from a single piece of wood. The great number of slender rods and points, running in all directions from the grain, show the extreme care necessary.

Sands of the Arabian desert are included in the soil collection in Hall 36.

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STONE AGE HALL, SOON TO OPEN, WILL SHOW ANCESTORS OF HUMAN RACE

By Henry Field
Assistant Curator of Physical Anthropology

The Hall of the Stone Age of the Old World (Hall C) will be opened to the public this month. Its object is to present, for the first time in any museum, the most complete and interesting picture that present scientific knowledge permits, of the lives, cultures, and physical characters of prehistoric ancestors of the human race. The preparations have involved extensive travel and research, and the acquisition of archaeological collections from all parts of the world.

The general plan was worked out by the writer in collaboration with Dr. Berthold Laufer, Curator of Anthropology, with the generous cooperation of Abbé Henri Breuil, professor at the Collège de France and Corresponding Member of Field Museum.

In order to obtain data for accurate exhibits, it was necessary to visit many prehistoric sites. In June, 1927, Frederick Blaschke, the sculptor, accompanied the writer to Europe to make studies *in situ* for diorama groups. Abbé Breuil accompanied the expedition as technical adviser; a photographer and an artist also were taken. A scale model, motion and still pictures, and paintings of each site were prepared. No detail was overlooked, and all reconstructions in the hall are based on data obtained in this careful manner.

This expedition and three subsequent trips were financed by Trustee Marshall Field. Other contributors to the cost of the creation of this hall were Trustees Frederick H. Rawson and Silas H. Strawn.

Life-size human figures were made by Mr. Blaschke, under the direction of Sir Arthur Keith, Professor G. Elliot Smith, and Abbé Breuil. These restorations of prehistoric man are the finest ever made.

In the hall are eight diorama groups containing these sculptured figures. They are arranged in chronological order, each presenting a realistically depicted scene in the life of a prehistoric period. The painted backgrounds are the work of Staff Artist Charles A. Corwin.

Opposite the dioramas are cases of archaeological material, including objects of stone and bone, reproductions of human remains, and fossil specimens of fauna of each period.

Entering the hall from the west, the first diorama presents a scene of the Chellean period in northern France, approximately 250,000 years ago. Because of the meagerness of data on this period, the scene is shown appropriately in the dimness of silvery moonlight. Two Chellean hunters are huddled close to a fire in the shelter of a large rock. One of them is chipping flakes from a crude flint hand ax. In the background, on the opposite bank of a river, large elephants and other animals are silhouetted against the sky.

The Beginning of Art

The urge for aesthetic expression seems to have first awakened in Aurignacian man, about 35,000 years ago. In this restoration, a group in the Hall of the Stone Age, a prehistoric artist is picturing his hand on the wall of a cave by blowing ochre around the fingers through a tube. Other hands and crude representations of animals are seen on the wall.

The next diorama shows a Neanderthal family in a rock shelter at Gibraltar about 50,000 years ago. The azure blue of the Mediterranean forms the background. It is believed that family life developed during this period.

The Aurignacian period, approximately 35,000 years ago, is represented by a scene in the cave of Gargas in southwestern France (*see accompanying illustration*). At that period, apparently, man's aesthetic sense first found expression, embodying perhaps the beginnings of art, magic, and religion. In the group a man, kneeling upon the floor, holds his left hand against the wall, and blows powdered red ochre around the fingers by means of a bone tube. On the wall are many negative impressions of hands, the fingers of which frequently appear to have been mutilated. The mutilation probably was done purposely for some ritual reason, similar to the practice of certain modern primitive peoples. The firelight and the sandstone lamp cast eerie shadows among the stalactites.

In the following scene a Solutrean sculptor of Eskimo type is portrayed carving the outline of a horse on a limestone block. In a semicircle behind him is a frieze of pregnant horses and bison cut in relief. Fertility rites were performed before this sanctuary at Le Roc, Charente.

The Magdalenian period, about 25,000 years ago, is represented by a reproduction of the bison of clay from the cave of Tuc d'Audoubert. This also is the symbol of a fertility rite, and one can picture the Magdalenians dancing around these models, praying for increase of the herd of bison.

In a small case opposite lies the original Cap-Blanc skeleton — the only Magdalenian skeleton in the United States. The adjoining diorama is a reproduction of the Cap-Blanc rock shelter, where a frieze of horses, the finest sculpture of prehistoric times, was carved in high relief by Magdalenian artists.

The next diorama illustrates the beginning of the domestication of animals. This scene shows a wild boar hunt at Mas d'Azil, with hunting dogs holding the savage male boar at bay. Following this is a neolithic scene at Carnac in Brittany, where a priest is welcoming the birth of a new day, as the rising sun casts long shadows behind the rows of standing stones. The last group of the series is a beautiful scene at Lake Neuchâtel, Switzerland. In the foreground two fishermen are dragging their net to shore. In the background are seen the snow-capped Alps in the light of early dawn.

The exhibits in this hall form a permanent record of the struggles and advances of prehistoric man from the earliest times to the dawn of the historical period.

Cellulose Lacquer

The term lacquer, formerly applied to certain forms of varnish made by dissolving shellac and other natural gums, has recently been extended to cover various preparations of so-called artificial resins and to varnishing solutions obtained by chemical treatment of cellulose. Cotton fibers furnish the most convenient kind of pure cellulose, and are generally used in the cheapest obtainable form—linters, useless for spinning. In Hall 28 an exhibit shows the various steps in the preparation of this type of varnish.

Field Museum of Natural History

Founded by Marshall Field, 1893

Roosevelt Road and Lake Michigan, Chicago

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FIELD MUSEUM NEWS

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B. E. Dahlgren.....*Acting Curator of Botany*
Oliver C. Farrington.....*Curator of Geology*
Wilfred H. Osgood.....*Curator of Zoology*
H. B. Harte.....*Managing Editor*

Field Museum is open every day of the year during the hours indicated below:

November, December, January 9 A.M. to 4:30 P.M.
February, March, April, October 9 A.M. to 5:00 P.M.
May, June, July, August, September 9 A.M. to 6:00 P.M.

Admission is free to Members on all days. Other adults are admitted free on Thursdays, Saturdays and Sundays; non-members pay 25 cents on other days. Children are admitted free on all days. Students and faculty members of educational institutions are admitted free any day upon presentation of credentials.

The Museum's natural history Library is open for reference daily except Saturday afternoon and Sunday.

Traveling exhibits are circulated in the schools of Chicago by the N. W. Harris Public School Extension Department of the Museum.

Lectures for schools, and special entertainments and tours for children at the Museum, are provided by the James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures.

Announcements of free illustrated lectures for the public, and special lectures for Members of the Museum, will appear in Field Museum News.

A cafeteria in the Museum serves visitors. Rooms are provided for those bringing their lunches.

Chicago Motor Coach Company No. 26 buses go direct to the Museum.

Members are requested to inform the Museum promptly of changes of address.

MEMBERSHIP IN FIELD MUSEUM

Field Museum has several classes of Members. Benefactors give or devise $100,000 or more. Contributors give or devise $1,000 to $100,000. Life Members give $500; Non-Resident Life and Associate Members pay $100; Non-Resident Associate Members pay $50. All the above classes are exempt from dues. Sustaining Members contribute $25 annually. After six years they become Associate Members. Annual Members contribute $10 annually. Other memberships are Corporate, Honorary, Patron, and Corresponding, additions under these classifications being made by special action of the Board of Trustees.

Each Member, in all classes, is entitled to free admission to the Museum for himself, his family and house guests, and to two reserved seats for Museum lectures provided for Members. Subscription to Field Museum News is included with all memberships. The courtesies of every museum of note in the United States and Canada are extended to all Members of Field Museum. A Member may give his personal card to non-residents of Chicago, upon presentation of which they will be admitted to the Museum without charge. Further information about memberships will be sent on request.

BEQUESTS AND ENDOWMENTS

Bequests to Field Museum of Natural History may be made in securities, money, books or collections. They may, if desired, take the form of a memorial to a person or cause, named by the giver.

Cash contributions made within the taxable year not exceeding 15 per cent of the taxpayer's net income are allowable as deductions in computing net income under Article 251 of Regulation 69 relating to the income tax under the Revenue Act of 1926.

Endowments may be made to the Museum with the provision that an annuity be paid to the patron for life. These annuities are tax-free and are guaranteed against fluctuation in amount.

SOUTHWEST EXPEDITION RESUMES ARCHAEOLOGICAL EXCAVATIONS

The Field Museum Archaeological Expedition to the Southwest, which conducted excavations on the Lowry ruin in Colorado during the summers of 1930 and 1931, but was suspended in 1932, has resumed operations this summer. Dr. Paul S. Martin, Assistant Curator of North American Archaeology, who was leader during the expedition's two previous seasons, again is in charge of the work, having left Chicago for the field on June 16.

The Lowry ruin is a site holding the remains of an interesting offshoot of the culture known as that of Chaco Canyon. In the previous seasons the expedition exposed two kivas or ceremonial rooms, and collected pottery, prayer-sticks, and other artifacts of the ancient inhabitants of the pueblo. It was ascertained that the middle period of the pueblo was probably somewhere between A.D. 800 and 1000, but the time of the earliest occupation remains to be traced.

The expedition is financed from funds provided by the late Julius and Augusta N. Rosenwald.

CARNAUBA WAX

By B. E. Dahlgren
Acting Curator, Department of Botany

Mention of wax suggests to most people beeswax, product of the honeybee, which has long represented the conception of wax in general, despite the fact that certain mineral waxes such as paraffin have now become even more common. Waxes of vegetable origin are on the whole less important today and far less generally known than the mineral ones, although in parts of the United States a historical interest attaches to bayberry candles, made of wax obtained from berries of the wax myrtle.

Many plants produce wax in small quantity which may or may not be of great use to the plant, and may be of little or no economic importance to man. Carnaúba wax is a conspicuous exception. This vegetable product has found numerous applications in modern life. It has long been known as a material for candles, in which its admixture with other waxes and fats serves to give rigidity and to raise the melting point. It enters into the composition of plastic masses, such as those used for dictaphone and phonograph records. On account of its hardness and the fine high gloss it acquires on being rubbed, it is one of the chief ingredients of shoe polish and furniture and floor wax. It has found application in the textile industry as a filler and to give gloss to certain fabrics. Its consumption runs into thousands of tons per year, and its production serves to give occupation to a large part of the population of the semidry, often drought-afflicted region of northeastern Brazil.

This wax is the product of the carnaúba, a handsome fan-palm, being an excretion coating the surface of the leaf and serving as a protection against excessive evaporation. It is obtained by cutting, drying, and subsequently beating the leaves, which causes the wax to fall off as a fine powder which is later melted and poured into dishes or forms to cool. There are various commercial grades depending in quality on the age of the leaves and on the care exercised in preparation.

A series of specimens typical of the carnaúba palm, its wax and other products, was obtained last year by the writer in cooperation with S. C. Johnson and R. P. Gardiner, of Racine, Wisconsin, on a visit to Ceará, center of the carnaúba region of Brazil. Many of these specimens have been added to the exhibits of vegetable raw materials in Hall 28 and the palm exhibits in Hall 25.

NORTH AMERICAN HERONS EXHIBITED IN HALL 21

By Rudyerd Boulton
Assistant Curator of Birds

Long-legged wading birds of closely related forms are found all over the world, but most commonly in the tropics. Of the seven families that belong to this order, four are found in this country. Examples of these have recently been installed in the systematic series of North American birds in Hall 21 by Taxidermist Ashley Hine.

The flamingo, with feet and bill like a duck, and with legs, neck and body like a heron or stork, forms a connecting link between these two important groups of birds. Nowadays, flamingos are found only rarely at the southern tip of Florida, but they are more common in the West Indies and in South America. A habitat group of flamingos from the Bahama Islands, showing their peculiar nesting habits, is to be found in Hall 20.

The wood ibis, also from Florida and the Gulf states, is a victim of the misapplication of names, for it is not an ibis but the only member of the stork family inhabiting this country. The true ibises are represented by three species, while the roseate spoonbill, rare and colorful relative with a bill curiously adapted to specialized feeding habits, forms the fourth member of this group. These birds are confined to the southern part of the country.

All the twelve species of American herons and bitterns, commonly seen along the streams, sloughs, and lakes of the northern United States, are shown in the case just installed. Many of them are incorrectly called cranes. Cranes are related to the rail family and belong to an entirely different group of birds. The two well-known American cranes, the whooping and the sandhill, are shown in a habitat group in Hall 20.

The great blue heron, the green heron and the black-crowned night heron nest in the Chicago region, while the little blue heron, snowy egret and American egret, formerly martyrs to the traffic in plumage, occasionally visit us in late summer.

Malicious Magic in Africa

In the Hall of African Ethnology (Hall D), is a large wooden figure of a man studded with nails and pieces of iron driven in so closely that little of the body woodwork can be seen. A tribesman who desired to injure an enemy approached the medicine-man with a gift, asking that a sharp piece of iron should be driven into this symbolic figure of the foe. By sympathetic magic the enemy against whom these machinations were directed was supposed to be injured in a manner corresponding to the mutilation of the figure. Hearing that such a rite had been performed the victim might go away to die, or at least become sick and depressed. But should he be able to find payment, the medicine-man might be persuaded to remove the piece of iron which was symbolically causing pain.

Exact reproductions of the world's most famous diamonds are on exhibition in H. N. Higinbotham Hall.

ELEPHANT SEALS COLLECTED FOR MUSEUM GROUP

Five excellent specimens of elephant seals for a proposed habitat group to be installed in the Hall of Marine Mammals (Hall N), were collected last month by an expedition conducted for Field Museum to Guadelupe, an island belonging to Mexico and lying off the coast of Lower California.

The expedition, which completed its work from start to finish in the unusually short space of less than two weeks, was made aboard the yacht *Velero III*, owned and commanded by Captain G. Allan Hancock of San Diego, California, whence the party sailed. All arrangements for carrying out the project were made by Captain Hancock and Dr. Harry M. Wegeforth, President of the Zoological Society of San Diego. A part of the expense of the Museum's participation in the expedition was met with funds supplied by Mrs. Emily Crane Chadbourne. Two members of Field Museum's taxidermy staff, Julius Friesser and Frank C. Wonder, accompanied the party.

The *Velero III*, a 1,000-ton ship about 200 feet long, sailed May 28, and the hunting of the animals began immediately upon arrival in Guadelupe. The elephant seal is the largest of all seals. The species is becoming extremely rare and is under the protection of the government of Mexico to prevent its extermination. These giant seals are found in only two places in the world—the Guadelupe vicinity, and a certain region in the Antarctic. The Mexican government kindly issued permits for the collection of specimens for the Museum.

The five seals obtained range in weight from a small one of about 250 pounds to one about 5,000 pounds, which is close to the maximum size the animals attain. A curious feature of the animals is their inflatable proboscis or trunk from which they get their name, elephant seal. They have an air sack with which they can blow this proboscis up like a balloon.

It is very difficult to preserve and prepare the skins of these large marine mammals, and the Museum men sent on the expedition are experts especially qualified for the work.

While the expedition was at Guadelupe the island was shaken by an earthquake but no harm was done to members of the party, the ship, or the collection.

In recognition of their valuable services to this institution in making the expedition possible, Captain Hancock and Dr. Wegeforth have been elected Patrons of Field Museum.

Prof. A. C. Noé on Staff

Professor A. C. Noé, paleobotanist of the University of Chicago, has been appointed Research Associate in Paleobotany on the staff of the Department of Botany of Field Museum. Professor Noé, a preeminent authority in his field, gave valuable advice and cooperation to the Museum during the course of construction of the Carboniferous Forest exhibit in Ernest R. Graham Hall.

Collecting Colorado Fossils

Bryan Patterson, Assistant in Paleontology in the Museum's Department of Geology, has been granted leave of absence to spend most of the summer in Colorado in continuance of the work he did in 1932 in the collection of fossil mammals and other geological specimens. He left for the field on June 15.

PAINTING SHOWS BRONTOSAURUS, THE GREAT FOUR-FOOTED DINOSAUR OF NORTH AMERICA

By Elmer S. Riggs
Associate Curator of Paleontology

A large mural painting by Charles R. Knight of the great four-footed dinosaur, *Brontosaurus*, shows this animal at home beside a lagoon. A shore fringed with palm trees and crocodiles basking on a sunlit sandbar, fill out a tropic scene. Among such surroundings these great saurians lived in North America one hundred million years ago. Buried and preserved in those same sandbars, which are now turned to sandstone ledges, their fossil remains are found today.

This painting is one of twenty-eight exhibited on the walls of Ernest R. Graham Hall (Hall 38) of Field Museum. As surety of its accuracy, a mounted skeleton fifteen feet in height stands at the center of the hall. Skulls and gigantic bones of other dinosaurs surround it. Photographs show where the fossil remains of these giant reptiles were unearthed, and labels furnish details of their habits and relationships.

Not only was *Brontosaurus* a native of North America, but his fossil remains have been found on this continent exclusively. Ledges of sandstone or layers of hardened joint clays of Jurassic age, which crop out of the hills on both sides of the Rocky Mountains, have yielded the fossil remains of these great dinosaurs. Varying from brown to black in color, always petrified, sometimes of the hardness and the lasting qualities of limestone but often filled with silica of a flint-like hardness, these bones are washed out of the hills and broken up. Their fragments remain on the surface long after the rocks about them are worn away. These enduring qualities have made it possible for the fossil bones of these animals to be preserved in the earth by nature through the ages, and thus for some of them to be reconstructed in museums.

Fossil remains of *Brontosaurus* were first discovered at Morrison, Colorado, in the year 1877; other specimens were found at Canyon City, Colorado, and at Como, Wyoming, in the same year. Famous quarries where these and other related dinosaurs were later unearthed are known as the Bone Cabin Quarry near Medicine Bow, Wyoming, and the Dinosaur Monument at Jensen, Utah. Other specimens have been found at various localities.

The specimen mounted in this Museum was found near Grand Junction, Colorado, in 1901 by an expedition under the direction of the writer. Lacking the head and part of the tail, the Museum specimen is thirty-two feet long, indicating a probable total length for the animal in life of sixty-five to seventy feet. The largest individual brontosaurs were about eighty feet in length, and weighed probably about forty tons. Despite their terrifying appearance, they were undoubtedly unaggressive animals living rather placid lives, feeding upon leaves and water plants.

Restoration of Brontosaurus

Mural painting in Ernest R. Graham Hall depicting one of the largest of all dinosaurs, as fossil specimens indicate it must have appeared when living. Only in North America have remains of brontosaurs been found.

NORTH AMERICAN ARCHAEOLOGY EXHIBITS ARE REOPENED

The Museum's North American archaeological collections, which have not been on exhibition for the past several months due to the work of transferring them from Hall 3 and reinstalling them in Hall B on the ground floor, may now be seen again in their new location.

The exhibits in the hall represent the twelve archaeological culture areas of North America, and are arranged as far as possible in geographical order. They include pottery, weaving, stone and copper artifacts, burials and houses from the north and south Atlantic regions, eastern Canada, and the Iroquoian and Mississippi regions. There is a good collection of material from the famous Hopewell Mounds of Ohio. Another feature is a reproduction of an Illinois burial mound.

The exhibits relating to the archaeology of the southwestern United States remain in their separate location in Hall 7.

PRIMITIVE MAMMALS OF TODAY

By D. Dwight Davis
Assistant in Osteology

Skeletons of the most primitive extant mammals have been placed on exhibition in Hall 19. The curious monotremes, or egg-laying mammals, are represented by the duckbill and echidna, only surviving representatives of this ancient group. The skeletons of these animals have retained many reptile-like features which, in conjunction with abundant fossil evidence, indicate the derivation of mammals from extinct reptilian forms known as therapsids.

The marsupials, or pouched mammals, while not so primitive in structure as the monotremes, differ, nevertheless, from the higher mammals in many respects. One of their most characteristic features is a pair of bones which projects forward from the pelvis. These epipubic or "marsupial" bones, lacking in all other mammals, support the pouch in which the young are carried. The best-known marsupials are the American opossum and the kangaroo. The opossum and the rare caenolestes are the only marsupials found outside the Australian region.

Australia became separated from the mainland of Asia at a very early geologic date. Marsupials seem to have been the only mammal forms then inhabiting the Indo-Australian region. Thus they were isolated in a vast natural laboratory where they could develop unhampered by the later, more active and intelligent animals, which in other parts of the world soon replaced their slower-witted cousins.

A remarkable thing took place in Australia. The early, generalized marsupials developed to fill the available "ecologic niches"; that is, they took to life in the trees, to various environments on the ground, and to others beneath the surface of the ground. In each case they acquired specialized feeding habits. A group of animals is anatomically elastic. Changes in environment or habits result in modification of the structure of the animal to adapt it to the new conditions.

Considering the infinite types of variation possible, the resulting animals in Australia might be expected to be quite different from those in other parts of the world, as in some cases they are. However, while a kangaroo and a buffalo bear little resemblance to one another, the kangaroo is the Australian counterpart of the grazing animals found elsewhere. The phalangers are surprisingly squirrel-like in structure and habits; the dasyures are flesh-eaters, and closely resemble civets or weasels, even in the modified structure of their teeth; the wombat is like an unusually clumsy woodchuck; while other Australian animals are remarkably like rats, shrews and moles. This is one of the most striking examples ever observed of parallel development or "convergence" between animals in one part of the world and others entirely separated from them.

Of special interest in the Museum exhibit is a skeleton of the rare shrew-like caenolestes obtained in Venezuela by a Museum expedition. The exhibit was prepared by Edmond N. Gueret, Assistant Curator of Osteology, assisted by the writer.

SCIENCE CONVENTION AT MUSEUM

Field Museum was one of the various Chicago institutions acting as hosts last month to the convention of the American Association for the Advancement of Science, which was attended by scientists from all parts of the United States, and by many from foreign countries as well.

Various sections of the association, among them the botanists, zoologists, geologists, anthropologists, and geographers, held meetings in the James Simpson Theatre and also in the small lecture hall of the Museum on June 20, 21, 22 and 23. On the evening of June 23, after the public visiting hours, a special "open house" was held for the members of the association. Several thousand delegates to the convention on that evening made a private inspection of the Museum.

Earlier in the month the American Association of Museums likewise held its convention at various institutions, the June 15 meeting taking place at Field Museum. More than one hundred museum officials from all over the country had luncheon at the cafeteria, and then held a panel discussion in the small lecture hall on the subject of adult education.

Trophy Heads

In southern New Guinea, in the neighborhood of the Dutch-British boundary, the natives are not satisfied with merely killing an enemy, but preserve his head as a trophy. The skin is carefully removed from the head and neck, the skull is taken off and cleaned, leaves and fiber are substituted for the flesh, and the skin is put back over this and laced in place. The whole is then carefully smoked and dried. Three such trophies, one cut open to show its preparation, may be seen in the exhibit of material from the Fly River region in Joseph N. Field Hall (Hall A).

Dendrites

Dendrites are branching figures which look as if they were painted in some dark pigment on the surface of the rock in which they form. They are caused by water with minerals in solution penetrating narrow seams in rock. There the minerals carried by the water crystallize in forms resembling in appearance the frost crystals which occur on windows in cold weather. Some of the dendrites exhibited in Clarence Buckingham Hall (Hall 35) resemble pictures of wooded landscapes, and others are often mistaken for fossil plants.

A curious dendrite was obtained from the Chilean Desert by the Marshall Field Brazilian Expedition. It formed on a rubber gasket in a large water pipe in the mill of a copper mine at Chuquicamata. Little imagination is required to see it as a picture of a landscape with the peculiar desert vegetation of that region.

GUIDE-LECTURE TOURS

During July and August the conducted tours of the exhibits under the guidance of staff lecturers will be given on a special schedule, as follows:

Mondays: 10 A.M., General Tour; 11 A.M., Halls Showing Plant Life; 3 P.M., General Tour.

Tuesdays: 10 A.M., General Tour; 11 A.M., Halls of Primitive and Civilized Peoples; 3 P.M., General Tour.

Wednesdays: 10 A.M., General Tour; 11 A.M., Animal Groups; 3 P.M., General Tour.

Thursdays: 10 A.M., 11 A.M., and 3 P.M., General Tours.

Fridays: 10 A.M., General Tour; 11 A.M., Minerals and Prehistoric Exhibits; 3 P.M., General Tour.

There are no tours on Saturdays, Sundays, or on the July Fourth holiday.

Persons wishing to participate should apply at North Entrance. Tours are free and no gratuities are to be proffered. A new schedule will appear each month in Field Museum News. Guide-lecturers' services for special tours by parties of ten or more are available free of charge by arrangement with the Director a week in advance.

Gifts to the Museum

Following is a list of some of the principal gifts received during the last month:

From Mrs. Charles H. Schweppe—a bronze group of three figures beneath a terrestrial globe symbolizing the unity of mankind, and a stone head of a Rajput woman, Jaipur, a black marble head of an Abyssinian woman, Africa, and a stone bust of a Chinese woman; from Miss Malvina Hoffman—sculptured stone head of a Chinese youth, Shanghai; from William Becker—a clay tobacco-pipe, Bali tribe, Africa; from The American Museum of Natural History—7 reels of the Martin Johnson feature film "Simba"; from Arthur S. Vernay—2 complete reels of the film "India" and 3 cans of small strips of film; from Companhia Ford Industrial do Brasil—58 herbarium specimens and 8 wood specimens, Brazil; from Sr. Ing. Jésus G. Ortega—190 herbarium specimens, Mexico; from Robert Runyon—44 herbarium specimens, Texas; from Palm Oil Company—14 samples of palm nuts and oil, and 3 photographs, Central and South America; from Standard Oil Company (Indiana)—61 specimens petroleum products, Indiana; from Crystal Fluorspar Company—a specimen of fluorite, Illinois; from James Quinn—a lower jaw of *Aelurodon* sp. and a lower jaw of *Hemicyon* sp., Nebraska; from Robert R. Lipman—a specimen of native lead, Colorado; from Dr. Emil Witschi—a salamander and 4 toads; from Thomas Quantock—a domestic horse, Illinois; from Stewart Springer—47 fish specimens, Gulf of Mexico; from Watson Bartlett—an adult albino ovenbird, Illinois; from Dwight Davis and Walter Necker—22 salamanders, 22 frogs, 4 lizards, 13 snakes, and 21 turtles, southern Illinois; from A. A. Dunbar Brander—4 game birds; from John G. Shedd Aquarium—61 fish specimens from various parts of the Pacific; from University of California—137 herbarium specimens, Mexico.

NEW MEMBERS

The following persons were elected to membership in Field Museum during the period from May 16 to June 15:

Patrons

G. Allan Hancock, Dr. Harry M. Wegeforth.

Associate Members

Mrs. Nathaniel Allison, Mrs. George I. Keefe, Rev. Thaddeus Ligman, Rev. Stanley Radniecki, Paul G. Warren.

Annual Members

Mrs. H. G. B. Alexander, Mrs. C. B. Carter, Earl M. Converse, Charles S. Davis, Edgar C. Fowler, C. Duff Henry, Mrs. Marvin Hughitt, Mrs. Samuel I. Karger, Joseph J. Kelly, Grant S. Mears, Mrs. Frank G. Nicholson, W. M. Scudder, Charles Herbert Smith, Dr. C. E. Stanbury, C. F. M. Tinling, C. M. Varde, Lawrence Williams.

"Monkey Puzzle"

A branch of an Araucaria, a conifer known as the "monkey puzzle" or Chilean pine, is on exhibition in the Department of Botany. Its branches are covered with hundreds of small stiff leaves growing at very regular intervals and giving an effect of scaly armor. Its seeds are used as food by Indians of the western Andes region.

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GROUP SHOWS ORANGS IN NATURAL HABITAT

By Wilfred H. Osgood
Curator, Department of Zoology

In the early days of Field Museum, in fact during the nineties not long after the establishment of the institution, a group of orangs was prepared and installed by Carl E. Akeley. It was the first large mammal group of modern type to be exhibited in the Museum. The specimens had been collected in Borneo by C. F. Adams and were purchased and presented to the Museum by Trustee Martin A. Ryerson.

For that time the group was an excellent one and the workmanship was of the quality which brought to Akeley the recognition and support which led to his later and better-known productions. However, the group occupied a square floor-case suitable for its original purpose, but not in conformity with the arrangement of subjects in the Museum's present building. Therefore, it was decided recently to rearrange and adapt the group to a new setting in a built-in case with a semi-elliptical painted background.

The task of carrying out the plan was undertaken by Staff Taxidermist Leon L. Pray, whose skill and ingenuity combined with much patient detailed labor have brought it to a very successful conclusion. Although more than thirty years old, the mounted specimens were found to be in good condition, requiring no change except in their relative positions to each other. The new setting, however, involved the complete construction of a tree-top scene in a tropical forest. Tree-trunks, branches, and twigs were faithfully reproduced and a wealth of leaves and fruit was added to them. In all, nearly nine thousand artificial leaves were necessary. A painted background, also done by Mr. Pray, served to perfect the desired representation.

No visitor who sees this group is ever likely to think of the orang as anything but a forest-dweller and this, of course, is one of the objects of such complete representation of the animal's habitat. It does come to the ground to some extent, and is able to amble about in semi-erect position, but its real home is in the tree-tops. At night it sleeps in a rudely formed nest of boughs and leaves in aerial seclusion. A single nest apparently is not continuously occupied for long, and many freshly made ones are to be found in regions where the animals are numerous.

The orang or orang utan does not equal the size of the gorilla, but may be as large or larger than the chimpanzee. The old male in the Museum's group is exceptionally large, the spread of its outstretched arms being more than eight feet. It weighed 150 pounds when killed, and had a height of four feet six inches. When placed in erect position the arms extend to the ankles, being relatively longer than in the other man-like apes.

Although there are numerous characters distinguishing the orang from the other great apes, the simplest and most convenient one is its uniform reddish brown color. The melancholy expression of its face is also characteristic. It is much more frequently seen in captivity than the gorilla or the chimpanzee, and it can be taught to perform many tricks. In motion pictures, where it is now seen frequently, it often passes for the gorilla. It is still numerous in its sole habitat in the islands of Borneo and Sumatra, and with any reasonable degree of protection should be in no danger of early extinction.

Orang Group in William V. Kelley Hall

The huge ape in the center is an unusually large one. Its arm spread measures eight feet four and one-half inches from the tips of the fingers on one hand to the tips of those on the other.

Museum Is Cool in Midsummer

Field Museum has been repeatedly proved to be one of the coolest places in Chicago during the sweltering heat waves that strike the city from time to time. The great white building, largest in the world constructed of marble, seems to resist the sun's attacks almost completely, and with the aid of the ventilation system with which it is equipped a temperature of 68 degrees is maintained at all times.

EXHIBITS STRESS IMPORTANCE OF ILLINOIS MINERALS

By Henry W. Nichols
Associate Curator of Geology

The importance of Illinois as a producer of minerals is vividly brought out among the exhibits at Field Museum of the mineral products of the world. These demonstrate that its mineral resources are large, and their mining an industry greater than the similar industries of most states.

While the mineral products of Illinois are not spectacular ones like the gold and silver of Colorado, or the diamonds of South Africa, they are real money-makers like coal, silica, shale, clay, sand, gravel, and petroleum, on down to less known products such as fluorspar, magnesia from dolomite, peat, and marl.

Incidentally some silver is mined in Illinois, in conjunction with lead. Possibly even diamonds and gold could be found.

No doubt a few diamonds exist in the terminal moraine of the glaciers which swept Illinois thousands of years ago, for a few have been found in the moraines of Wisconsin, Michigan and Indiana. It is not likely that Illinois was entirely passed over during the distribution by the glaciers of these floats from undiscovered diamond fields of the far north. Likewise, small quantities of float gold have been washed from the moraine in Indiana, and probably a man armed with a pan and most unusual persistence could wash a few flakes of gold from our gravels. However, the maximum possible earnings of such a man in Indiana amount to about one dollar a day, and it is doubtful if one in thousands would attain even that.

An industry awaiting development in Illinois is marble quarrying. Deposits have been found which appear to have as desirable qualities as the better known ones in other states.

The most important fluorite mines of the country are in Illinois, and the highest quality sands are quarried on a very large scale at Ottawa. These have been adopted as the nation's standard for testing and comparison purposes. Lead and zinc are the only metallic ores in the state the mining of which has reached important proportions.

A large cut aquamarine, weighing 341 carats, is on exhibition in H. N. Higinbotham Hall of the Museum.

Field Museum of Natural History

Founded by Marshall Field, 1893

Roosevelt Road and Lake Michigan, Chicago

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November, December, January	9 A.M. to 4:30 P.M.
February, March, April, October	9 A.M. to 5:00 P.M.
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Admission is free to Members on all days. Other adults are admitted free on Thursdays, Saturdays and Sundays; non-members pay 25 cents on other days. Children are admitted free on all days. Students and faculty members of educational institutions are admitted free any day upon presentation of credentials.

The Museum's natural history Library is open for reference daily except Saturday afternoon and Sunday.

Traveling exhibits are circulated in the schools of Chicago by the N. W. Harris Public School Extension Department of the Museum.

Lectures for schools, and special entertainments and tours for children at the Museum, are provided by the James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures.

Announcements of free illustrated lectures for the public, and special lectures for Members of the Museum, will appear in Field Museum News.

A cafeteria in the Museum serves visitors. Rooms are provided for those bringing their lunches.

Chicago Motor Coach Company No. 26 buses go direct to the Museum.

Members are requested to inform the Museum promptly of changes of address.

MEMBERSHIP IN FIELD MUSEUM

Field Museum has several classes of Members. Benefactors give or devise $100,000 or more. Contributors give or devise $1,000 to $100,000. Life Members give $500; Non-Resident Life and Associate Members pay $100; Non-Resident Associate Members pay $50. All the above classes are exempt from dues. Sustaining Members contribute $25 annually. After six years they become Associate Members. Annual Members contribute $10 annually. Other memberships are Corporate, Honorary, Patron, and Corresponding, additions under these classifications being made by special action of the Board of Trustees.

Each Member, in all classes, is entitled to free admission to the Museum for himself, his family and house guests, and to two reserved seats for Museum lectures provided for Members. Subscription to Field Museum News is included with all memberships. The courtesies of every museum of note in the United States and Canada are extended to all Members of Field Museum. A Member may give his personal card to non-residents of Chicago, upon presentation of which they will be admitted to the Museum without charge. Further information about memberships will be sent on request.

BEQUESTS AND ENDOWMENTS

Bequests to Field Museum of Natural History may be made in securities, money, books or collections. They may, if desired, take the form of a memorial to a person or cause, named by the giver.

Cash contributions made within the taxable year not exceeding 15 per cent of the taxpayer's net income are allowable as deductions in computing net income under Article 251 of Regulation 69 relating to the income tax under the Revenue Act of 1926.

Endowments may be made to the Museum with the provision that an annuity be paid to the patron for life. These annuities are tax-free and are guaranteed against fluctuation in amount.

ATTENDANCE SHOWS LARGE GAIN

With a total of 1,471,016 visitors checked through its doors from January 1 to July 23 inclusive, Field Museum has had a gain in attendance of 585,057 persons thus far in 1933, or more than 66 per cent as compared with 1932, when, up to the same date the total attendance was 885,959.

While a certain amount of this increase may be attributed to the Museum's proximity to the grounds of A Century of Progress exposition, there is a large normal increase also. The attendance from January 1 to May 26, 1933, inclusive (the period prior to the opening of the exposition), totaled 707,245, which compares with the total of 549,407 attendance registered between the same two dates of 1932. Thus the pre-exposition period of 1933 shows an increase of 157,838 or more than 28 per cent over 1932.

NEW PUBLICATIONS ON SALE

Among the most recent publications from Field Museum Press are a special guidebook, *Archaeology of North America*, a new edition of the *General Guide* to the exhibits in the Museum, and a new edition of the *Handbook of Field Museum*.

Archaeology of North America covers the exhibits in Hall B, giving much supplemental and detailed information. It is of value as a reference book either by itself or in connection with a visit to the exhibits. Dr. Paul S. Martin, Assistant Curator of North American Archaeology, is the author. Among subjects covered in the 122 pages of text are the origin and antiquity of the Indians, the various culture areas of North America, Indian mounds and methods of burial, the manufacture of stone artifacts, the mining of copper and manufacture of copper implements, bone and shell work, pottery, and popular fallacies regarding North American Indians. The book is illustrated with eight photogravure plates, ten pages of drawings, and a map. It is sold at the Museum for 50 cents; postage extra on mail orders.

The *General Guide* has been brought up to date to include the new halls opened in the Museum, and the various additions to exhibits, reinstallations, etc. It sells for 15 cents. The *Handbook* has likewise been revised to include the history of the Museum since the last edition, and other additional material. It contains eight illustrations and is priced at 25 cents.

COCONUTS

To the average American a coconut represents merely an occasional delicacy, to be eaten either in the raw state, or in a cake, pie, or candy. There are parts of the world, however, where the coconut tree is the most important producer of nearly all the necessities of life—staple food, drinks, utensils, clothing, and shelter. In some places in the South Seas coconuts form one of the main dishes for breakfast, lunch, and dinner. The fruit is usually eaten before it ripens. The watery liquid or "milk" in the fruit is used as a drink, and the sap of the tree, obtained by cutting unopened flower clusters, is boiled down to sugar, and fermented to produce palm wine. Children of the tropics eat a strange coconut candy—the part of the sprouted coconut which bulges into the center and absorbs the meat and milk. It is very tender and sweet.

Coconut palm leaves are used as roof thatch in constructing huts for shelter. Split coconut palm leaves provide fringe for skirts. The midribs and splints are woven into baskets, fire fans and other useful objects. Coconut shells make good dishes, and are sometimes made into ornamental objects. Some Melanesians cut, carve, and polish the shells to make beautiful cups and baskets. One group in the South Seas enlists the aid of shrimps to make bottles of coconut-shells. The nuts, with their eyes punched open, are placed in water where a small variety of shrimp lives. The shrimps swim through the eye into the center of the nut and eat all the meat; thus the unbroken shell becomes a bottle. Some tribes rub coconut oil all over their bodies as a cosmetic.

Aside from its local uses in the tropics, the coconut is of great importance in the world's commerce as a source of copra, the dried coconut meat from which coconut oil is obtained for edible fat and for use in soap-making.

An exhibit illustrating how coconuts grow is to be found in the Hall of Plant Life (Hall 29). Coconut palm material is exhibited in Hall 25, where there is also a specimen of the so-called double coconut of the Seychelles islands, which has the largest seed in the plant kingdom.

AN UNUSUAL FLUORITE CRYSTAL

A purple fluorite crystal of unusually large size was recently presented to the Museum. On account of the excellence of the specimen it is displayed apart from the regular fluorite collection in Hall 34. It is installed in an individual case, adding one more to the small group of exceptional minerals so displayed. The specimen is a nine-inch cube of purple fluorite growing out of a mass of the mineral, with edges and corners of other cubes projecting from its faces.

Fluorites have long been favorites with collectors on account of their frequently perfect crystal forms and the brilliant purple and green color of many of the specimens. In the mineral collection in Hall 34 near the case containing this specimen there is a large collection of other fluorites containing many colorless, purple and green crystals as well as some of less common color. In Frederick J. V. Skiff Hall (Hall 37) there is another collection of less showy but more useful fluorite containing examples of kinds mined for industrial purposes in many parts of the world.

The new specimen is from Hardin County in southern Illinois where the largest fluorite mines of the country are found. The specimen was presented by the Crystal Fluorspar Company of Elizabethtown, Illinois.

Basketry Materials Exhibited

While there are only a few commercial basket materials, chiefly willow, rattan, and certain kinds of wood splints, the basket fibers used by primitive peoples are numerous, including reeds, sedges, culms of grasses, bamboos, palm leaves, stems and twigs of shrubs, and splints from wood or from woody roots. In an exhibit in Hall 28 there are shown some Mexican baskets of different patterns made from the culms of a grass. Also displayed are several baskets, a tray, and a tobacco case with attractive designs, manufactured in Japan and the Philippine Islands from rattan and other materials.

The famous "Outlook Pagoda," in China, tallest that has survived in good condition, is represented by a miniature model at Field Museum.

STONE AGE HALL EXHIBIT SHOWS MEN OF 250,000 YEARS AGO

The Hall of the Stone Age of the Old World (Hall C) was completed last month, as announced in the July issue of FIELD MUSEUM NEWS.

There is presented herewith an illustration showing another of the diorama groups in the hall—a scene of the Chellean period, approximately 250,000 years ago. Last month an exhibit representing the beginning of art in the Aurignacian period, 35,000 years ago, was reproduced in the NEWS.

The Chellean period is identified with the earliest human remains ever found in Europe. It gets its name from the site at Chelles in northern France which is the type station for the period. The climate at this time was mild, and elephants, rhinoceroses and hippopotami wandered over Europe.

In the Museum group two Chellean hunters are seen squatting in the foreground beside a fire. One of them is making a flint hand ax for hunting. In the distance is a meandering river on the banks of which are a number of animals. Research has revealed only fragmentary facts about this era, and the dim moonlit scene of the Museum exhibit appropriately symbolizes the scantiness of our knowledge.

Men of the Chellean Period

Life in the period identified with the earliest human remains ever found in Europe, as represented in the Hall of the Stone Age of the Old World.

The group is the work of Frederick Blaschke, and the background was painted by Staff Artist Charles A. Corwin. Plans for this group, as for the seven others in the series, were worked out by Henry Field, Assistant Curator of Physical Anthropology.

In a case supplementing this group are casts of the most famous prehistoric remains discovered—those which scientists have labeled *Sinanthropus* (the Peking man), *Pithecanthropus erectus* (Java ape-man), *Eoanthropus* (Piltdown man), and *Homo Heidelbergensis* (the Heidelberg man).

New Petroleum Exhibit

The former exhibit of liquid petroleum products in Hall 36 has been replaced, through the courtesy of the Standard Oil Company (Indiana), by a synoptic collection intended to indicate the wide ramification of petroleum products and the many ways in which they affect our daily life. The new collection is installed in a tall case, six feet long and five feet wide. In this case there are fifty-eight specimens covering, in a synoptic way, the wide range of uses of the more than four hundred direct and many thousands of indirect petroleum products.

Spectacled Bear Received

A fine male specimen of the rare spectacled bear of northern South America has been presented to the Museum by W. A. Olen and F. D. Hurley of Clintonville, Wisconsin.

Spectacled bears are related in type to certain Asiatic bears. They inhabit the Andes region from Peru to Colombia. The species makes a striking appearance because of its characteristic white markings, which include rings around the eyes resembling spectacles.

Bark Cloth

The fibrous bast of the paper mulberry tree is employed by natives of South Sea islands in making a fabric resembling a fine white cloth, known as "tapa" or "kapa." The sheets of bast are peeled from the tree, soaked in water, and beaten with a wooden mallet until they spread out and remain flat. They are then matted together in large pieces as fine as muslin. Some varieties of tapa cloth are made rather thick and resemble tough wash leather. The material may be dyed and printed, and is easily bleached. The bast of the same tree is also extensively used in Japan and China for making paper of a tenacious quality.

African bark cloth is prepared by beating the bark of a fig tree until the material is rendered supple.

An exhibit, installed in Hall 28, shows a specimen of paper mulberry bark after it has been beaten into a thin sheet, and samples of tapa cloth, ornamented with crude designs, as worn by South Sea islanders.—L.W.

Fine examples of native African woodcraft are on exhibition in Hall D.

TURTLES OF THE CHICAGO AREA

By KARL P. SCHMIDT
Assistant Curator of Reptiles

Nine easily recognized kinds of turtles are found within a radius of fifty miles from Chicago. Some of these are common throughout the area, while others are local in their distribution, and at least two kinds are found only in the Indiana dune region. Nearly all may be seen among the exhibits in Albert W. Harris Hall (Hall 18).

The best-known locally is probably the snapping turtle, well named for its aggressive temperament. The "snapper" represents a distinct family confined to the Americas. It has a relatively small shell on the under side. Snappers are regularly on the market in the eastern states, but are not commonly eaten in Chicago

The common turtles which live in fresh waters in North America are usually known as "terrapins" or "sliders." The Cumberland terrapin, abundant in the Mississippi drainage, reaches the Chicago area only in the Kankakee and Fox Rivers. It has an elongate red marking on the temple. The geographic turtle is rare in this region, but has been recorded from northern Indiana. Both of these species attain a shell length of about ten inches.

The small turtles with bright yellow spots on the shell, best known as spotted turtles, are abundant in the swampy areas just south of the Indiana dunes. Also related to the terrapin group is the common painted turtle, easily recognized by the bright red markings along the edges of the shell, light borders to the shields on the back, and a dark pattern on the lower shell. Indiana specimens of the painted turtle have this dark marking narrow, while to the westward it becomes a broader and more complicated pattern. Most Chicago specimens of it are intermediate between the Indiana and the western forms.

Two land turtles are found locally. One is Blanding's turtle, which has a rather high shell and an imperfectly hinged lower shell that can be partly closed. It forages on land during the summer, but apparently hibernates in the ponds. The box turtle has a still higher dome-shaped shell and a perfectly hinged lower shell, which closes tightly at both front and back. It is exclusively a land turtle, hibernating in sheltered hollows in leaf mold. In this region it is found only in the Indiana dunes.

The musk turtle is a small species with a disagreeable odor. It is abundant throughout the eastern United States. Rarely more than four inches in length of shell, it is recognizable by its dull, uniform coloration and small-sized lower shell, whose plates are widely separated by soft skin. It represents another exclusively American family of turtles, related to the snapping turtles.

The soft-shelled turtle, often called the "leatherback" by fishermen, is the strangest in appearance of the local turtles. Its bony shell is covered with cartilage and leathery skin, and, partly for this reason, it is the best of our turtles for soup. Its shell is extremely flat, and its broadly webbed hind feet are a striking adaptation to life in the lakes and streams.

North America is rich in turtles, especially fresh-water varieties. Including the marine species of the coasts, some sixty-two species of turtles are to be found in the United States.

The ethnology of primitive Siberian tribes is illustrated in Hall E.

THE STORY OF AN EXPEDITION TO COLLECT ELEPHANT SEALS

By Julius Friesser
Staff Taxidermist, Department of Zoology

The Hancock expedition to collect specimens of elephant seal for a habitat group to be installed at Field Museum sailed from San Diego, California, on May 28, aboard the yacht *Velero III*, owned and commanded by Captain G. Allan Hancock of Los Angeles. Included in the party were Dr. Harry M. Wegeforth, President of the Zoological Society of San Diego, who with Captain Hancock arranged for the expedition, and two members of the Museum's taxidermy staff—Frank C. Wonder and the writer.

The *Velero III*, a vessel about 200 feet long with a displacement of 1,000 tons, arrived opposite the Mexican island of Guadalupe, which lies off the coast of Lower California, on the morning of May 29, and preparations for the hunting of the elephant seals began immediately. Because of the extremely heavy surf running up to the shore of the island it was necessary to anchor the ship more than a mile out, and go ashore in the small boats. These trips, participated in by Wonder, myself, and some of the excellent sailors from the crew of the yacht, proved perilous. At times, as the surf boats stood on their beam ends, and then plunged down from crest to trough of huge waves, it seemed that the small craft could not weather the seas.

On the so-called "elephant beach" of Guadalupe, and in other localities near-by, we encountered great herds of elephant seal, about 1,200 in number. These placid animals seemed totally undisturbed by our arrival, paying little or no attention as we reconnoitred to select the most suitable specimens for the Museum's purpose. They showed no excitement even when, having selected a specimen, we shot it and began the work of skinning. One seal, in fact, came up so close to us that it was in the way, interfering with our work. The cows and the bulls were found segregated in colonies on different beaches, as they do not mingle except in the breeding season.

The animals had to be skinned immediately after shooting in order to preserve the skins from decomposition, which sets in with extreme rapidity. During our stay of several days we took five specimens, ranging in weight from a large bull of about 5,000 pounds to a young seal of 250 pounds. Skinning, and beaming the skin, required about eighteen hours' continuous work on each full-grown specimen. In the midst of this work an earthquake shook the island, tumbling down huge boulders from the 3,000-foot cliff which rises behind the beach, but fortunately none fell close enough to injure members of our party.

The skin alone of the largest specimen weighs about 1,000 pounds, making a difficult load to handle with the limited equipment we could take to the beach. The problem of transporting the heavy and awkward cargoes to the ship was solved with a large raft constructed by members of the crew of the *Velero III*. The skins were towed on this raft, pitching and tossing in the heavy surf, to the side of the yacht by a power tender. Frequently it seemed that raft and power boat must inevitably overturn, but they got through safely. Hoisting the skins to the deck of the yacht likewise presented difficulties, and the pelt of the large bull was almost lost overboard.

Within less than two weeks of intensive work our objective had been accomplished, we arrived back in the harbor of San Diego, and shipped our specimens to Chicago. The work of mounting them will soon begin.

Until comparatively recently the elephant seal seemed to be in danger of extermination. In 1892, according to zoological records, only two elephant seals remained alive on Guadalupe, due to the demand up to that time for seal oil. Thus it appears that after being on the verge of virtually certain extinction, the herds have almost miraculously recuperated to the present large numbers. A curious feature of this species of seal is its expandable proboscis or trunk from which it derives the name "elephant seal." A related species, the southern elephant seal, which lacks the proboscis, is found in certain Antarctic regions.

Elephant Seals

Scene on the "elephant beach," island of Guadalupe, showing part of herds numbering hundreds of world's largest species of seals. Inset: A close-up view of one of the animals showing the proboscis from which the species gets its name, "elephant seal." Photographs made on the Hancock Expedition to Guadalupe for Field Museum.

AUGUST GUIDE-LECTURE TOURS

During August the conducted tours of the exhibits under the guidance of staff lecturers will be given on a special schedule, as follows:

Mondays: 10 A.M., General Tour; 11 A.M., Halls Showing Plant Life; 3 P.M., General Tour.

Tuesdays: 10 A.M., General Tour; 11 A.M., Halls of Primitive and Civilized Peoples; 3 P.M., General Tour.

Wednesdays: 10 A.M., General Tour; 11 A.M., Animal Groups; 3 P.M., General Tour.

Thursdays: 10 A.M., 11 A.M., and 3 P.M., General Tours.

Fridays: 10 A.M., General Tour; 11 A.M., Minerals and Prehistoric Exhibits; 3 P.M., General Tour.

There are no tours on Saturdays and Sundays.

Persons wishing to participate should apply at North Entrance. Tours are free and no gratuities are to be proffered. A new schedule will appear each month in Field Museum News. Guide-lecturers' services for special tours by parties of ten or more are available free of charge by arrangement with the Director a week in advance.

Gifts to the Museum

Following is a list of some of the principal gifts received during the last month:

From Mrs. Ynes Mexia—210 herbarium specimens, Brazil; from Professor H. E. Stork—225 herbarium specimens, Costa Rica; from School of Forestry, Yale University—a board of *Eucalyptus marginata* (Jarrah), Australia; from Dr. E. E. Sherff—78 herbarium specimens, Hawaii and Argentina; from William A. Schipp—42 herbarium specimens, British Honduras; from Stephen Varni—5 specimens illustrating stages of cutting a star from crystal; from James Manning—a specimen of placer gold ore and a specimen of tin ore, Alaska; from Johan Eriksen—a specimen of rhomben-porphyry, Norway; from H. B. Conover—2 aun grebes, Brazil, and 3 birds for skeletons, Illinois; from Mrs. W. W. Lietzow—a mounted snowy owl, North Dakota; from Mrs. Grace Wiley—2 tree frogs; from John G. Shedd Aquarium—65 fish specimens, Pacific Ocean; from Edward Brundage, Jr.—74 insects, North Carolina, and a deformed woodchuck skull, Illinois; from P. M. Miles—a Komodo lizard skeleton, East Indies; from W. A. Olen and F. D. Hurley—a spectacled bear, Peru; from P. F. Fullmer—a brown thrasher, Illinois; from Lieutenant Ralph V. Strauss—a mounted toucan, Canal Zone; from Mrs. Lillian Tilske—a mounted least bittern; from James Simpson—2 mounted capercaillie; from Mr. and Mrs. John P. Kellogg—117 birdskins, Africa; from Colonel Lewis S. Thompson—3 specimens of batfish, near Marathon, Florida; from Dr. Florentino Felippone—a red bat, Uruguay; from Dan Clark—a starling skeleton, Illinois; from Walter A. Weber—3 bird skeletons.

NEW MEMBERS

The following persons were elected to membership in Field Museum during the period from June 16 to July 15:

Associate Members

Mrs. Carl Buehler, Miss Kate E. Chislett, Brode B. Davis, Mrs. B. A. Eckhart, Mrs. George E. Frazer, Mrs. John Roberts, Eugene M. Stockton, Mrs. Milton W. Wilker.

Sustaining Members

Daniel H. Bender

Annual Members

Miss Lillian D. Bargquist, L. R. Barton, Jay Bowman, Mrs. Giovanni Cardelli, John O. Carr, C. D. DeBarry, Dr. C. J. DeBere, Dr. R. J. Hyslop, R. W. Jackson, John H. Kraft, J. George Lutz, Howard Mann, Peter F. McNamee, Mrs. F. S. North, William F. Quarrie, Lester Roth, Theodore Rubovits, Mrs. J. C. Ruettinger, Wayne Saggars, W. H. Shoemaker, E. L. Wilson.

Myrrh is an exudate from small trees (*Balsamodendron* and *Commophora*) of the torchwood (*Bursera*) family found in Nubia, Somaliland, and Arabia (see exhibit in Hall 28).

Batik fabrics, and the process of making them, are illustrated in the Javanese exhibits in Hall G (Arthur B. Jones Collection).

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HABITAT GROUP OF MANATEES OR SEA-COWS ADDED TO MARINE MAMMAL HALL

By Wilfred H. Osgood
Curator, Department of Zoology

Through the cooperation of the John G. Shedd Aquarium, Field Museum has been enabled to obtain specimens of the Florida manatee in perfectly fresh, natural condition. This has facilitated their preparation in an unusually life-like manner and provided material for an important addition to the Hall of Marine Mammals (Hall N). Two animals of this peculiar and little-known species have served to form the subject of an under-water scene which takes an appropriate place in the development of this hall.

The manatee almost defies popular definition. It is a sirenian, but sirenians as a group have no other vernacular name unless it be "sea-cow," which conveys no suggestion of their relationships and certainly none of their appearance. Sirenians are herbivorous, and, since they are mammals, they give milk; but, beyond this, reasons for calling them sea-cows are hard to find. They do not even live in the sea exclusively, but frequent fresh water most of the time. They are among those relics of bygone ages which have continued down to present times long after their near kindred have disappeared. Extant sirenians include, besides the manatee of Florida and the Gulf coast, a very similar if not identical species in the West Indies, another in the large rivers of South America, and still another in Africa. In addition, a very distinct but quite related animal, the dugong, inhabits the shores of the Indian Ocean. Within historic times a very large species called Steller's sea-cow was found in northern waters about small islands in Bering Sea. This was at once exterminated by its discoverers.

Owing to their fish-like form and their aquatic habits, in conjunction with some anatomical characters, the sirenians were long regarded as somewhat related to whales, but recent information obtained through study of extinct forms points rather unexpectedly to elephants as their nearest relatives among modern mammals. They are, like whales and seals, descended from land mammals and in their adaptation to aquatic life have lost all superficial resemblance to their ancestors.

The Florida manatee is a slow-moving, inoffensive animal living in fresh, brackish, or salt water at moderate depths where it finds an abundance of water plants which form its entire subsistence. One of these has come to be known as "manatee grass." The animal feeds under water, coming to the surface only to breathe and never appearing on land. It has no external ears and its eyes are very small. Its lips are very deeply cleft and furnished with heavy bristles which assist in cropping its food. It reaches a length of about thirteen feet. and a weight of as much as 1,200 pounds.

Florida Manatees

Commonly known as sea-cows, these animals are among the most curious mammals inhabiting water. They may be seen in the Hall of Marine Mammals.

Manatees are captured by spearing with heavy harpoons or by the use of strong rope nets. At times they have been sought especially for their flesh, which is reputed to be excellent. It is light-colored, and both in appearance and flavor is said to resemble lean fresh pork. The extinction of the American manatee was threatened some years ago, but some protection is now afforded it and possibly it will be able to maintain itself, at least in certain restricted localities.

The specimens in the Museum's group were prepared by Staff Taxidermist Leon L. Walters, assisted by Edgar G. Laybourne. The background is by Leon L. Pray. The method used with the animals is that so successfully employed elsewhere in the Museum for reptiles and hairless or nearly hairless mammals. By this method the skin is reproduced in a celluloid-like material in such a way as to preserve the finest details of texture and exact shades of color.

RAYMOND FOUNDATION PRESENTS PROGRAM BY INDIANS

Through the courtesy of The American Indian Villages at A Century of Progress, Field Museum is enabled to present for children a special program of songs, dances, and games, participated in by men, women, and children of several tribes, including the Navaho and the Hopi. This program, which will be given in the James Simpson Theatre of the Museum, on Saturday morning, September 30, has been arranged under the provisions of the James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures. There will be two performances, one at 10 A.M., and one at 11, so as to make it possible for several thousand children to attend. One of the Indian chiefs is to be featured on the program in imitations of birds' songs.

Admission is free, and children from all parts of Chicago and suburbs are invited to attend. No tickets are required.

Museum Honors Geneva Scientist

In recognition of the important assistance he has rendered to Field Museum in carrying out its botanical work in its joint project with the Rockefeller Foundation, the Board of Trustees of the Museum has elected Dr. B. P. Georges Hochreutiner a Corresponding Member of this institution. This is a class of membership, bestowal of which is restricted to scientists or patrons of science residing in foreign countries who have rendered eminent service to the Museum. Dr. Hochreutiner is Director of the Conservatoire et Jardin Botaniques at Geneva, Switzerland. Through his cooperation the important collections of type specimens of plants in that institution were made available for photographing for the Rockefeller Foundation–Field Museum project.

Rare Porphyry from Norway

A rare kind of porphyry called rhombenporphyry is found in Oslo, Norway, and seldom if ever elsewhere. Johan Eriksen, a citizen of Oslo, recently collected, without solicitation from the Museum, a specimen of the porphyry, shaped it to standard size and shape for exhibition, and sent it as a gift to the Museum. It now appears in the rock collection in Hall 35.

Field Museum of Natural History

Founded by Marshall Field, 1893

Roosevelt Road and Lake Michigan, Chicago

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Chicago Motor Coach Company No. 26 buses go direct to the Museum.

Members are requested to inform the Museum promptly of changes of address.

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Each Member, in all classes, is entitled to free admission to the Museum for himself, his family and house guests, and to two reserved seats for Museum lectures provided for Members. Subscription to FIELD MUSEUM NEWS is included with all memberships. The courtesies of every museum of note in the United States and Canada are extended to all Members of Field Museum. A Member may give his personal card to non-residents of Chicago, upon presentation of which they will be admitted to the Museum without charge. Further information about memberships will be sent on request.

BEQUESTS AND ENDOWMENTS

Bequests to Field Museum of Natural History may be made in securities, money, books or collections. They may, if desired, take the form of a memorial to a person or cause, named by the giver.

Cash contributions made within the taxable year not exceeding 15 per cent of the taxpayer's net income are allowable as deductions in computing net income under Article 251 of Regulation 69 relating to the income tax under the Revenue Act of 1926.

Endowments may be made to the Museum with the provision that an annuity be paid to the patron for life. These annuities are tax-free and are guaranteed against fluctuation in amount.

RAGWEED AND HAY FEVER

BY PAUL C. STANDLEY
Associate Curator of the Herbarium

Every year many articles in newspapers and scientific publications are devoted to poison ivy, but the persons affected by that plant are relatively few, and are only those who actually come into contact with the plant as it grows in the fields and woods. A greater cause of discomfort to the human race is found in the plants that cause hay fever, for these pursue their victims to the cities, and cause there, among a denser population, a still greater amount of suffering than in the thinly inhabited regions where they grow.

As is well known, hay fever, an affection that causes such acute distress to its many victims and arouses so little sympathy among onlookers, is caused by the inhalation of wind-blown pollen of various plants. In Illinois there are three well-marked hay fever seasons: in April and May, when cottonwoods, elms, and oaks are in flower; in June, when bluegrass, timothy, and other grasses are blooming; and, of prime importance, a period from the middle of August to mid-September, when ragweeds are in full bloom.

Many other plants besides those mentioned are responsible for hay fever, but they are of minor importance. In northern Illinois they include such varied weeds as cocklebur, Russian thistle, lamb's quarters, pigweed, English plantain, and many others.

The ragweeds, however, are by far the most important cause of hay fever. Two kinds grow almost everywhere about Chicago: the common ragweed, that abounds on dusty roadsides, in harvested grain fields, and in vacant city lots; and the giant ragweed, that prefers low moist ground, especially in stream valleys, but thrives all too well in the waste land in Chicago. Both these plants are illustrated by lifelike reproductions in the Hall of Plant Life (Hall 29) in Field Museum.

Of all the annual weeds native in northern Illinois, none grows so rapidly and vigorously as giant ragweed. Large tracts of lowland in the Calumet region often are overgrown with the plants, six to ten feet high and so dense that it is almost impossible to force a way through them. Not even in the most favored sections of the tropics, probably, is it possible to find more luxuriant plant covering.

Each year about the middle of August some effort is made to destroy the ragweed patches that occupy the waste land in Chicago, in order to lessen hay fever suffering. While these local weeds are a menace to people living near them, ragweed pollen is so light that it is carried long distances by the wind, and there is an ample supply of it everywhere throughout the farming regions. Cutting the ragweed in the city, therefore, is of little value in relieving hay fever patients, and there is no hope that relief may ever be obtained for them by suppression of the source of the affliction.

LABRADOR SEA TROUT

BY ALFRED C. WEED
Assistant Curator of Fishes

Many fishermen are surprised to learn that eastern brook trout or speckled trout frequently go to the sea in summer and spend several months growing fat on the abundant food in bays and inlets. It is even more astonishing to find that a close relative of the European charr is found in North America and spends most of its life in the sea. This fish is called "trout" in Greenland and "sea trout" along the Labrador coast.

A fine male sea trout, collected by the Second Rawson-MacMillan Subarctic Expedition to Labrador and Baffin Land (1927–28), has been reproduced in celluloid by Staff Taxidermist Arthur G. Rueckert and is now on exhibition in Albert W. Harris Hall (Hall 18).

The salmon family, as understood at present, is divided into three great groups: the Pacific salmon; the Atlantic salmon and its relatives, including brown, rainbow, steelhead, and cut-throat trouts; and the charrs, including the European charr and the Dolly Varden, eastern brook, and lake trouts. The charrs are generally supposed to confine themselves strictly to fresh water. With the exception of the lake trout, they live mainly in the smaller streams, frequently at high altitudes.

European varieties of charr range from small residents of Alpine brooks to fish almost as large as salmon found in Sweden and Norway. Varieties of the same species are found in North America and Greenland. In streams of Baffin Land and Greenland they often reach a length of more than three feet, and weigh more than twenty pounds.

In Labrador, these sea trout spawn in the streams and probably spend their winters in lakes and deep pools. As soon as the ice opens up enough so they can travel in the rivers, they go down to the sea, where they stay until the approach of freezing weather starts them toward the breeding grounds. The young trout go to salt water when they are about a year old, and sometimes stay there through their second winter.

While living in the sea, these trout are colored similarly to the whitefish or lake herring. Their sides are silvery and their backs pearly green or blue. When they go up the streams to the spawning beds, their colors change. The back becomes a deep greenish or brownish black in which the brilliant red spots characteristic of charrs gleam like fiery coals. The silvery color of the sides of the males changes to a brilliant vermilion. The lower fins are vermilion, with borders of white. The sides of the females are even more brilliant, shining with an intense pure blood-red.

HOPI POTTERY

The Hopi Indians were manufacturing excellent pottery when first encountered by Spanish explorers in 1540. They or their ancestors had likewise turned out fine wares for centuries before the arrival of the Spaniards.

After the Spanish conquest, a marked degeneration of the industry set in. Many pueblos abandoned entirely the art of pottery-making, while others continued it but with a very poor technique.

In 1897, however, some archaeological work was being done by the late Dr. J. W. Fewkes at one of the ancient Hopi towns. One of the potters of a near-by village saw the beautiful pottery which was being excavated from graves. She was so inspired by the sight of the ancient wares that she began to copy their designs. As a result the Hopi potters at present are turning out fine work which is a skillful imitation of the lost style.

A collection of Hopi pottery has just been installed in Hall 7. Here may be seen pottery that was made about 1540, 1850, and 1910, together with an exhibit which illustrates the Hopi process of pottery manufacture step by step.

THE NEANDERTHAL GROUP IN THE HALL OF THE STONE AGE

Neanderthal man, represented in the second of the groups in the recently opened Hall of the Stone Age of the Old World (Hall C), was probably the first to seize a woman and protect her from animals and other men. Thus the beginnings of family life may be placed at the time of his existence, or about 50,000 years ago.

The Dawn of Family Life

Life-size restoration of a Neanderthal family of 50,000 years ago in their rock-shelter at Gibraltar. Hall of the Stone Age of the Old World.

The Museum's group, prepared by the sculptor Frederick Blaschke, shows a Neanderthal family on the sandy platform outside the entrance to the Devil's Tower rock-shelter at Gibraltar. Silhouetted against the deep blue of the Mediterranean stands a young man with a wooden club in his hand. He is watching intently some movement on the beach below, since he and his family are open to attack only from this direction. Squatting beside the embers of the fire, the father of the family is watching mussels open as the heat penetrates the shells. His small five-year-old son, anxious to help, is bringing a small twig to replenish the fire. In a cleft in the rock the mother can be seen carrying her youngest baby on her hip.

The group was planned by Henry Field, Assistant Curator of Physical Anthropology. Staff Artist Charles A. Corwin painted the background.

Supplementing the exhibit is a collection of representative cultural objects of the period, some original Neanderthal skeletal fragments, and a series of casts of the more complete Neanderthal skeletons excavated in various localities of Europe.

CHARMS USED BY THE PAPUANS

A few shavings of wood scraped from the back of a wooden image and mixed in the food of a person whose love is desired, will exert a charm that will make that person reciprocate one's affections, in the belief of certain natives of New Guinea. Similarly, they believe that shavings from another carved figure, mixed with the food of one's dog, will make him a better and braver hunter, in attacking wild boars.

These are but two of the many weird charms in which the wild Papuan natives place their faith—superstitions similar to those of many other primitive peoples. Various grotesque wooden figures they carve, a fine collection of which is on exhibition in Joseph N. Field Hall (Hall A), are invested with other specific powers of making different kinds of wishes come true. Some figures are believed to be "the abode of good spirits." Small ones are attached to bags, baskets, and ornaments, hidden in houses, and carried about on one's person.

A Gypsum Cave Reproduction

A peek into subterranean depths, into a crystal cave, is made possible by an exhibit in Clarence Buckingham Hall (Hall 35). The exhibit is a reproduction of a gypsum cave, the original of which is located in Wayne County in southeastern Utah.

The Museum's cave is constructed with large gypsum crystals, remarkable for their size, purity, and perfection of form. These were brought from Utah. Some of them are shown projecting from the floor of the cave, others from the sides, and others hang from the roof. This is the manner of their occurrence in the Utah caves, where they were discovered in comparatively recent years by cowboys.

Other cave formations from many parts of the world, representing caves in Kentucky, Missouri, Cuba, Italy, and other countries, are shown in an adjoining case. This exhibit includes also a collection of cave specimens presented to the Museum shortly before his death by Floyd Collins, the Kentuckian whose tragic fate, when he became imprisoned in a cave collapse, engaged the attention of the whole country some years ago.

Visitors Present Specimens

Visitors to Chicago from distant places frequently take advantage of the opportunity to have their fossils and geological specimens identified at Field Museum. Others bring specimens to present to the Museum. While many of these duplicate material already in the Museum collections, some unique and valuable specimens from this source are being added to the exhibits.

The Department of Botany has an exhibit illustrating the standard used in grading coffee.

A CRYSTAL STAR

By Henry W. Nichols
Associate Curator of Geology

Five specimens which illustrate the method of cutting a "varnistar" from rock crystal have been presented to the Museum by Stephen Varni of New York. They are now exhibited in Hall 34. Although the primary object of the exhibit is to show the successive stages of shaping and polishing which intervene between the rough crystal and the finished star or, for that matter, between the rough and the finished state of any fine gem, most people will be more interested in the demonstration of the remarkable increase of brilliancy and fire imparted to gemstones by the skill of the modern lapidary.

Gems in the rough never display their maximum brilliancy. This can be developed only by skillful cutting. The surface of most fine gems is formed of many small polished planes called facets. Much of the brilliancy depends on the form, position, and angles of these facets, although much also depends upon the general shape and intrinsic brilliancy of the stone. This star is far more brilliant than the piece of rock crystal shown near-by from which it was cut. This is due in part to the general form of the star and in part to the position and angles of the facets which are so designed as to cause a maximum amount of the light which enters the stone to be caught and thrown back through the front face. Slight changes in the shape of either star or facets would seriously impair the brilliancy. Any light passing into the stone and reaching the lower face strikes a facet at such an angle that it cannot penetrate but is reflected back and forth inside the gem until it leaves from the upper surface. In other words, light penetrating the gem is trapped there and cannot leave except by the front door.

The skillful cutting which increases the brilliancy of a gem also enhances its fire. This is a sparkle of flashes of colored light which seems to emanate from the gem.

Rays of white light passing through a facet are not only bent but are separated into the rainbow colors of which white light is a mixture and flashes of these colors are mixed with the white light thrown out by the gem. The facets on a well-cut gem are placed at such angles that this effect is at a maximum. This brilliancy and fire characterize gems cut in modern times. Compared with these, gems of ancient workmanship seem dull and lifeless.

Gems are not always cut for maximum brilliance. Various factors such as color and the shape of the rough stone often influence the cutting, and sometimes, as in the cabochon cut, form is preferred to brightness.

Brilliance and fire cannot be imparted to a stone in which these qualities are lacking. They are inherent in differing degrees in each kind of stone. The lapidary can only develop what is already there. A bit of glass or a topaz cannot be cut to rival a diamond.

Frankincense

Frankincense is a resin furnished by trees (*Boswellia* sps.) of the torchwood family growing in tropical Africa and Arabia. It is used as a drug and in incense. Frankincense is displayed among the resins in Hall 28.

A simple method that anyone can use to distinguish between true and imitation amber is demonstrated in the collection of amber in Hall 34.

ANCIENT PERUVIAN GOLD BEAKER

By J. Eric Thompson
Assistant Curator of
Central and South American Archaeology

In memory of the late Richard T. Crane, Jr., Benefactor and for many years Trustee of Field Museum, Mrs. Richard T. Crane has presented a very fine gold beaker to Field Museum. This weighs just under five and one-half ounces troy and is of twenty-karat gold. It is undecorated save for a narrow band in repoussé near the rim. This decoration and the beaker shape clearly indicate that the vessel was manufactured by the ancient inhabitants of Peru. A gold vessel almost a duplicate of the Crane beaker was found at Pachacamac on the Peruvian coast, but this beaker shape is typical of the highland region from Cuzco to Tiahuanaco. It is very probable that both vessels were manufactured in the latter region.

Gold Beaker
From ancient Peru. Presented by Mrs. R. T. Crane.

The Crane beaker is an important addition to Field Museum's collections, for, despite excellent gold collections from Colombia and Panama, the gold work of Peru has been little represented in the Museum. Much of the enormous gold treasure of the Incas was melted down by Pizarro and his followers, while an immense quantity of gold and silver objects was hidden by the Peruvians to avoid its seizure by the Spaniards. The secret of the location of this treasure is lost. Consequently Peruvian gold ornaments are rare in all museum collections.

The Crane beaker may have been used for drinking chicha, a beverage resembling beer, but made from maize. Its original owner was undoubtedly a person of considerable importance, who probably lived some time between A.D. 1200 and 1500.

The beaker will be placed on exhibition very shortly.

Dogs and Wolves Exhibited

All the more important species of larger dogs (exclusive of domestic varieties) and wolves of the world are included in a case just installed among the systematic mammal exhibits in Hall 15. The collection covers the main divisions of the whole family Canidae with the exception of the foxes, which are to be shown in a separate case.

Among the more interesting species shown are the northern gray wolf and the coyote of North America, the long-legged red-maned wolf and the crab-eating dog of Brazil, the spotted hunting dog, red Abyssinian wolf and two species of jackals from Africa, and the small reddish wolf called the dohle, which inhabits Asia.

GOLD MINED BY A DUCK

An interesting example of placer gold mined by a duck at Cold Spring-on-Hudson, New York, has been presented to the Museum by Frederick Blaschke and is now exhibited with the placer gold in Frederick J. V. Skiff Hall (Hall 37). The specimen consists of particles of gravel mixed with flakes of gold. The gold occurred in a deposit of glacial gravel and was appropriated by a duck as a part of the gravel he needed to assist his digestion. The duck demonstrated more keenness of vision than of intellect for the soft particles of gold are decidedly inefficient grinding agents for use in a bird's crop. Mr. Blaschke found the gold in the crop of the duck.

The ice of the continental glacier that covered the north of the continent during the glacial period originated in the north and traveled south. On its way, when passing over a deposit of gold ore, it sometimes picked up a few grains of gold and carried them south mixed with the clay, sand, and rock fragments with which the ice was loaded. When the ice melted and dropped its load to form the mantle of glacial drift which covers the northern United States it also dropped the gold. No worth while concentrations of gold of this origin have ever been found nor are any likely to be, but a few flakes have been found in numerous places in the moraines.

—H.W.N.

BIRTHSTONES

The origin of the custom of designating birthstones according to the month in which a person was born has been traced back some 6,000 years. It had its beginnings in ancient beliefs in magic, according to historians. The story goes that about 4,000 B.C. the high priest of Memphis wore a breastplate made up of twelve small objects representing Egyptian hieroglyphics. Priests continued to wear similar breastplates. Later, ancient Hebrews, who had been prisoners in Egypt, made a similar breastplate for Aaron, their own high priest. It was composed of twelve large gems, on each of which was engraved the name of one of the tribes of Israel. It was handed down from one priest to the next, and as it grew older its magic powers were believed to increase. As time went on, the twelve stones, originally associated with the twelve tribes of Israel, became associated with the twelve angels of Paradise, the twelve foundations of Heaven, the twelve apostles, and finally with the twelve months of the year. From the last developed the birthstone idea. The wearing of one's birthstone originated in Poland some time during the seventeenth or eighteenth century.

Examples of the birthstones for each month of the year are on exhibition in H. N. Higinbotham Hall (Hall 31). The recognized list, according to Dr. Oliver C. Farrington, Curator of Geology, is as follows: January, garnet; February, amethyst; March, bloodstone or aquamarine; April, diamond; May, emerald; June, pearl; July, ruby; August, sardonyx or peridot; September, sapphire; October, opal; November, topaz; and December, turquois.

In the middle ages it was thought that each gem had a certain power over its wearer. A diamond was supposed to give courage; an amber necklace to cure a sore throat; a cat's-eye to protect from witchcraft; an amethyst to make its owner shrewd in business.

Huge Bison Bull Shown

The unusually large and magnificent specimen of American bison bull presented to the Museum a few months ago by Colonel Wallis Huidekoper, owner of the American Ranch at Twodot, Montana, has been mounted and placed on exhibition in the collection of horned and hoofed mammals in George M. Pullman Hall (Hall 13). The specimen is from a large herd kept on Colonel Huidekoper's ranch. It weighed about 2,300 pounds when living. It was prepared for exhibition by Staff Taxidermist Julius Friesser.

SEPTEMBER GUIDE-LECTURE TOURS

Conducted tours of exhibits, under the guidance of staff lecturers, are made every afternoon at 3 P.M., except Saturdays, Sundays, and certain holidays. Following is the schedule of subjects and dates for September:

Friday, September 1—Prehistoric Hall.

Week beginning September 4: Monday—Labor Day holiday, *no tour;* Tuesday—General Tour; Wednesday—Animal Groups; Thursday—General Tour; Friday—Story of Man.

Week beginning September 11: Monday—Plant Halls; Tuesday—General Tour; Wednesday—Moon, Meteorites, and Minerals; Thursday—General Tour; Friday—Pewter, Jade, and Gems.

Week beginning September 18: Monday—Marine Life; Tuesday—General Tour; Wednesday—Unusual Plants; Thursday—General Tour; Friday—Chinese Exhibits.

Week beginning September 25: Monday—Reptiles, Past and Present; Tuesday—General Tour; Wednesday—Story of Coal and Oil; Thursday—General Tour; Friday—Birds of Many Lands.

Persons wishing to participate should apply at North Entrance. Tours are free and no gratuities are to be proffered. A new schedule will appear each month in Field Museum News. Guide-lecturers' services for special tours by parties of ten or more are available free of charge by arrangement with the Director a week in advance.

Gifts to the Museum

Following is a list of some of the principal gifts received during the last month:

From Mrs. Richard T. Crane—a pre-Columbian gold beaker, Peru; from Philip M. Chancellor—49 ethnological specimens of the Yaqui tribe, Mexico; from Companhia Ford Industrial do Brasil—28 herbarium specimens and 9 wood specimens, Brazil; from Mrs. Ynes Mexia—55 herbarium specimens, Brazil; from School of Forestry, Yale University—84 herbarium specimens, Colombia and British Honduras; from Darsie A. Green—2 geodes, Oklahoma; from Paul R. Hedburn—7 fossil leaves, Illinois; from George Nelson—7 specimens native copper, Michigan; from Stewart Springer—a rare shark, Mississippi; from Professor H. W. Norris—5 shark heads, Mississippi; from Metropolitan Museum of Natural History, Nanking—22 small mammal skins with 15 skulls, China; from John H. Robinson—5 snakes and 2 lizards, Missouri; from G. C. Allen—skull and horns of white-tailed deer, Alabama; from J. J. Mooney—2 mouse skeletons, Illinois; from The Charleston Museum—7 grass pickerels, South Carolina; from John G. Shedd Aquarium—105 fish specimens, various localities; from Martin Petersen—a fish; from Dillman S. Bullock—57 frogs, 87 lizards, and 14 snakes, Chile.

NEW MEMBERS

The following persons were elected to membership in Field Museum during the period from July 17 to August 15:

Corresponding Members

Dr. B. P. Georges Hochreutiner

Associate Members

Mrs. W. Woodbridge Dickinson, Mrs. Abraham Harris, Joseph J. Hornung, Herman C. Nebel.

Annual Members

Miss Minnie Abel, Mrs. George W. Billig, James H. Buell, Mrs. Stanley Clague, Sr., Sigmund W. David, Charles C. Holter, Mrs. Pearl Ecker Hubbell, S. C. Jennings, F. W. Kaempfer, Jr., Charles S. McCoy, Granville Rice, Otto Sauermann, Mrs. Thomas G. Sexton, Harry W. Solomon, Mrs. Alfred Stern, Mrs. Abner J. Stilwell, E. A. Webber.

Distinguished Visitors

Sir John Flett, K.B.E., of the Geological Survey of Great Britain, visited Field Museum August 9 to study the methods of the Department of Geology and of the N. W. Harris Public School Extension, for comparison with the work of the Survey's London Museum. W. Campbell-Smith of the Mineral Division of the British Museum, who is studying exhibition methods of American museums, is another distinguished visitor of the month.

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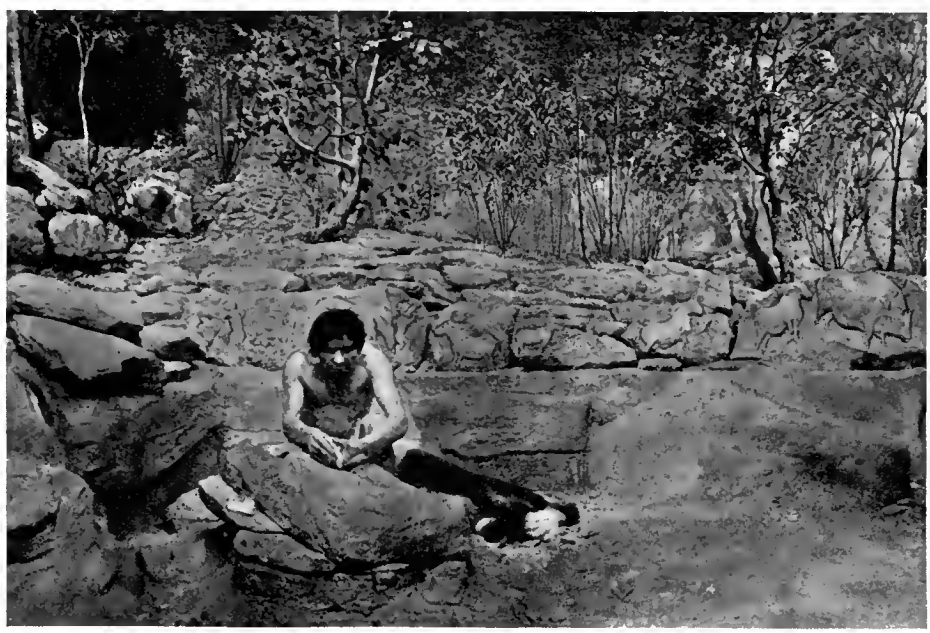
SOLUTREAN EPOCH DEPICTED IN HALL OF STONE AGE

By Henry Field
Assistant Curator of Physical Anthropology

The fourth group* in the recently opened Hall of the Stone Age of the Old World (Hall C) represents a scene of the Solutrean epoch. In this period, estimated at about 22,000 years ago, the climate was growing colder, and the horse and reindeer were the chief sources of food. Along the banks of the Danube, then swinging westward into southwestern France and northern Spain, came a race of invaders who, in appearance, were almost identical with the modern Eskimo and may have been the Eskimo's ancestors. Anthropologists have named these people Solutreans after the type station containing their artifacts in the commune of Solutré, Saone-et-Loire, France. They were probably inferior in physique to their predecessors, the Aurignacians. They left for posterity some sculptures of an imposing character, and they developed a peculiar technique for fashioning flint spearheads and lances which gave their product a degree of perfection not found again until advanced neolithic times, thousands of years later.



A Solutrean Sculptor

Group in the Hall of the Stone Age of the Old World showing a man of about 22,000 years ago. The famous Solutrean frieze of Le Roc in the Charente region of France is reproduced in this exhibit.

In the Museum group there is reproduced the famous Solutrean frieze of Le Roc in the Charente district of France. This reproduction was made possible by the courtesy of Dr. Henri Martin, discoverer of the frieze, who furnished the Museum with casts of the original sculptures. The five blocks have been arranged in the position in which they were placed by the Solutrean artists. On the left is a path leading to a cave, and on the right, sheltered behind large trees, can be seen the entrance to another cave. The vegetation of the time is represented in the background of the group. In the foreground a Solutrean sculptor of Mongoloid type is shown at work, carving the outline of a horse on a block of stone. Flint chips and flakes collected at Le Roc are scattered on the ground.

The five sculptures of Le Roc, reproduced in this group, represent: (1) a masked human being, dancing; (2) two small horses, and an animal with elongated muzzle and raised tail; (3) a musk-ox charging a man who is fleeing; (4) more horses and an ox; and (5) a small horse following a fantastic animal with a head like that of a boar or carnivore, an elliptical eye, elongated muzzle, pointed ears, and no horns.

In a case opposite the group are exhibited Solutrean artifacts from Le Roc and other sites, including the type series from Solutré.

The group is the work of sculptor Frederick Blaschke, executed on plans made by the writer, who visited Le Roc to obtain data for the group. Staff Artist Charles A. Corwin prepared the painted background.

*The first three groups, Chellean, Neanderthal, and Aurignacian, have been pictured and described in the July, August, and September issues of Field Museum News.

Gaekwar of Baroda Visits Museum

His Highness the Maharaja Gaekwar Sir Savaji Rao III, ruling monarch of Baroda, was a visitor at Field Museum on August 29, and made a tour of some of the principal exhibits, accompanied by Director Stephen C. Simms.

Among other distinguished visitors received at the Museum during the past month were Sir Arthur Smith-Woodward, former curator of paleontology of the British Museum; Dr. Victor Van Straelen, Director of the Musée Royale d'Histoire Naturelle de Belgique, Brussels; Dr. A. W. Grabau, professor of paleontology at the National University of China and chief paleontologist of the Chinese Geological Survey, Peiping; and Professor Richard Willestätter of Munich, winner of the 1918 Nobel prize in chemistry.

LIMBLESS LIZARDS AND SNAKES WITH LEGS

By Karl P. Schmidt
Assistant Curator of Reptiles

Lizards have a familiar typical form—that of a scaly quadruped with a long tail. It is accordingly remarkable to find that many lizards whose four-footed relatives are easily recognizable have wholly lost their limbs and, with elongation of body and tail, have become snake-like in body form. Every continent exhibits this type of lizard evolution, which has evidently taken place independently from a great variety of four-limbed ancestors. Every stage in the loss of limbs and elongation of body is exhibited in the skink family, which includes species with five, four, three, and two toes, and with limbs reduced to mere stumps or entirely absent.

This mode of evolution is frequent among lizards with burrowing habits and is, in such species, frequently accompanied by loss of eyes and ear openings. Such lizards, except to the technically trained students, may be indistinguishable from similarly blind burrowing snakes. Others, however, retain the active senses of their ancestors and are readily distinguishable from snakes by their movable eyelids and ear-openings, structures which are absent in snakes. The common "glass snake" of North America, which reaches the vicinity of Chicago, is a limbless lizard of this class.

These creatures exhibit plainly enough the mode of derivation of snakes from a lizard ancestry. The relation of the snake tribe to lizards is made evident by the presence of vestiges of hind limbs in the pythons and boa constrictors, which include a series of bones within the body, at each side of the vent, with a large external claw. None of our Chicago snakes belong to this primitive group, whose only representatives in North America are two small snakes, the rosy boa and the rubber boa, found in California.

Limbless lizards are more abundant and varied in Africa than in any other region. A small collection of reptiles and amphibians recently received by Field Museum from Port Nolloth, South Africa, includes four species of these remarkable forms. One of these has vestiges of hind limbs, while three are entirely without external sign of limbs or eyes.

Field Museum of Natural History

Founded by Marshall Field, 1893

Roosevelt Road and Lake Michigan, Chicago

Field Museum is open every day of the year during the hours indicated below:

November, December, January	9 A.M. to 4:30 P.M.
February, March, April, October	9 A.M. to 5:00 P.M.
May, June, July, August, September	9 A.M. to 6:00 P.M.

Admission is free to Members on all days. Other adults are admitted free on Thursdays, Saturdays and Sundays; non-members pay 25 cents on other days. Children are admitted free on all days. Students and faculty members of educational institutions are admitted free any day upon presentation of credentials.

The Museum's natural history Library is open for reference daily except Saturday afternoon and Sunday.

Traveling exhibits are circulated in the schools of Chicago by the N. W. Harris Public School Extension Department of the Museum.

Lectures for schools, and special entertainments and tours for children at the Museum, are provided by the James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures.

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Cash contributions made within the taxable year not exceeding 15 per cent of the taxpayer's net income are allowable as deductions in computing net income under Article 251 of Regulation 69 relating to the income tax under the Revenue Act of 1926.

Endowments may be made to the Museum with the provision that an annuity be paid to the patron for life. These annuities are tax-free and are guaranteed against fluctuation in amount.

METEORITE SOCIETY ORGANIZED

The Society for Research on Meteorites was organized at meetings held on August 21 and 22 in the small lecture hall of Field Museum. This institution was chosen as the meeting place because of its important meteorite collection, largest in the world in number of falls represented.

Dr. Oliver C. Farrington, Curator of Geology, was elected honorary president of the society, and Associate Curator Henry W. Nichols was elected a member of the council of the organization. Scientists from all over the country attended. Dr. Frederick C. Leonard, chairman of the department of astronomy at the University of California at Los Angeles, was elected president; Dr. C. C. Wylie of the University of Iowa and Dr. W. F. Foshag of the United States National Museum, were elected vice-presidents; and Professor H. H. Nininger of the Colorado Museum of Natural History, was chosen secretary-treasurer. Councilors include L. F. Brady of the Museum of Northern Arizona, Dean G. M. Butler of the University of Arizona, Professor Raymond E. Crilley of Iowa Wesleyan College, Dr. W. T. Whitney of Pomona College, and Dr. F. R. Moulton of the University of Chicago.

MUSEUM CLOSING HOUR CHANGES OCTOBER 1

Beginning October 1, visiting hours at Field Museum of Natural History will be from 9 a.m. to 5:30 p.m. daily until October 31. Since June 1 the Museum has been open every day from 9 a.m. to 7 p.m. for the convenience of visitors to A Century of Progress.

On November 1 the Museum will resume its regular schedule of visiting hours, which varies slightly at different seasons, as follows: November, December, and January—9 a.m. to 4:30 p.m.; February, March, April, and October—9 a.m. to 5 p.m.; May, June, July, August, and September—9 a.m. to 6 p.m.

PARA RUBBER

By B. E. Dahlgren

Acting Curator, Department of Botany

Rubber is essentially an American product. At the time of the early Spaniards in tropical America the Indians in Mexico used rubber playing balls, and in South America they were acquainted with the latex of the rubber tree and its use as waterproofing for rain capes. The Amazonian Indians made syringes of rubber with a perforated stick of wood for a nozzle. The first scientific report on rubber was made by Condamine and Bouguer in 1736 to the Paris Academy of Sciences.

Nevertheless, in Europe and North America rubber was almost unknown until about a hundred years ago. The English chemist Priestley is said to have discovered its usefulness as a pencil eraser. A practical process for impregnating cloth with a rubber solution was patented in Great Britain in 1823 by Mackintosh, whose name has since become a synonym for raincoats. With the discovery of the process known as vulcanization, consisting of the treatment of rubber with sulphur, the usefulness of the new material was greatly increased. Its present enormous importance dates, of course, from the invention of the pneumatic tire, which has made the crude "coucho" or caoutchouc of the Indian an indispensable raw material of the industrial world.

There are many kinds of rubber. All of them consist of the dried latex or sticky juice of certain plants. The list of rubber-yielding plants known is now very extensive, including hundreds of species scattered over all continents. The latest to be announced is from Russia, a dandelion-like plant of western Asia with a rubbery root, that may be grown far to the north in the temperate zone. Of the large number of plants from which rubber may be obtained only a few have actually been found to yield a product of great commercial importance, and of these only one yields a rubber of really prime quality for most purposes, viz., the Brazilian rubber tree, *Hevea brasiliensis*, of the Amazon. This furnishes the Brazilian product known as Pará rubber, so named from its chief port of exportation. It is this species which, transplanted to the moist tropics of the East Indies on a large scale, now furnishes practically all of the so-called plantation rubber.

Formerly the Amazon was the only source of supply. The rubber industry is still important there, but in the virtual absence of producing plantations, is confined to tapping the wild trees of the forest. These yield a superior product but at a cost of time and effort much greater than that expended on plantation rubber. The rubber trees in the forest are scattered. The gatherer of rubber must live far from his kind, establish and maintain himself in the forest, often under very difficult conditions, far from sources of supply. He must find a sufficient number of trees more or less convenient of access within a reasonable range of his camp and cut a path for himself from tree to tree before he can begin his daily round of collecting.

Most of the Amazon rubber thus obtained comes to market in large balls, formed gradually by pouring the collected rubber latex on a stick revolved over the smoke of a palm nut fire, which causes the milky juice to coagulate. This is continued daily until the ball of rubber grows to such dimensions that it becomes unmanageable or inconvenient for one man to handle, the average weight of the balls being about sixty pounds when fresh.

A plantation rubber tree showing the now usual manner in which the bark is cut in shallow V-shaped incisions, and a wild rubber tree showing the effects of tapping in the crude manner formerly in use on the lower Amazon, have been placed on exhibition among the raw plant materials in Hall 28 of the Museum. Shown with these are the tools used for making the incisions, and specimens of Pará rubber in the form in which it comes into the market. This exhibit was made possible by gifts of material received from Van Cleef Brothers and the Wilkinson Process Rubber Company of Chicago, and by collections obtained by the Marshall Field Botanical Expedition to the Amazon in 1929.

To illustrate the botanical characters of the Hevea rubber tree a fruiting branch of this tree obtained by the Amazon expedition has been reproduced in the Stanley Field Plant Reproduction Laboratories of the Department of Botany. The whole forms an instructive and important nucleus for an exhibit which will include the principal kinds of rubber from various other sources.

An unusually fine carved lacquer screen from China, eighteenth century, deposited by Mrs. Marshall Field, Sr., occupies the North Gallery above Stanley Field Hall.

ESSENTIAL OILS

By Llewelyn Williams
Assistant in Wood Technology

Essential, ethereal, or volatile oils are odoriferous substances of an oily character, occurring normally in plant tissues or produced incident to the life processes of plants. They give these plants their characteristic aromas. The oils are present, as a rule, in small amounts, and may be confined to special cells, glands, or ducts of the plant. In some instances they are limited to one particular structural element, while in others they are dispersed throughout the various parts, such as the bark, roots, leaves, flowers, or fruit.

In scented flowers, such as the rose, the oil is chiefly concentrated in the petals, whereas in spice-producing plants the concentration may occur in the leaves and bark, as in the case of cinnamon, or in the fruit, as in nutmeg. In some species of conifers the oil may be confined to the needles and twigs. The function of the oil in the life of the plant is uncertain. It may be merely an excretory by-product or it may be a secretion serving a specific purpose, such as attracting insects to the flower.

Most essential oils are insoluble in water, but they are freely soluble in alcohol and ether. They have an extensive range of uses, and have been employed since ancient times for cosmetic and ritual purposes, for incense, and for embalming. The invention of distillation, perhaps in ancient Egypt or in India, made possible the extraction of essential oils in the pure state. They are now commonly employed in the manufacture of perfumes, cosmetics, soaps, and drugs, and as flavoring agents.

Most of these essential oils may be liberated from plants without undergoing decomposition. The principal methods of extraction are by distillation; by extraction with volatile solvents, such as alcohol; by expression, either by hand or by machine; and by absorption in fat, known as the "enfleurage" process.

In Hall 28 of the Department of Botany there has recently been installed an extensive exhibit of essential oils, representing material obtained from plants growing in the United States, Central and South America, Europe, India, Ceylon, and other countries. The material for this collection was in large part contributed by Fritzsche Brothers of New York, American representatives of Schimmel and Company of Miltitz, Germany.

THE SARGASSUM-FISH

By Alfred C. Weed
Assistant Curator of Fishes

Many travelers have seen and wondered at the masses of sargassum or gulf weed floating in the ocean currents, but few of them have any idea of the multitude of small creatures that live in these masses and drift with them to all parts of the sea. Fish, crabs, snails, squids, and many other creatures climb through the weed or rest on the branches, while barnacles, sea plumes, and various other forms of life are attached to the stems or leaves and spend their lives traveling at the will of the winds and ocean currents.

One of the strangest of the creatures that live in these water plants is a small fish that is called sargassum-fish, mouse-fish or fishing frog. It belongs to the great group of angler-fishes, which have the side fins developed like and used as feet. Its ventral (leg) fins are under its throat, while its pectoral (arm) fins are back near its tail. These fins look almost like the feet of a frog and are as flexible and useful as the hands of a monkey. The "wrist" joint, which is very short in an ordinary fish, is long and slender like an arm, and the fins wave around like the fans used by a dancer. The gill openings, instead of being in the usual place, are carried back under the skin behind the "arm."

The sargassum-fish swims only when necessary to cross some open space where it cannot go around. Most of the time it climbs around through the weeds, using its fins like hands. It grasps the stems and leaves as firmly as a man would a rope. It is constantly looking for something to eat, and when it sees a suspicious movement in the weeds it is ready to take the crab or other animal into its great mouth. All the creatures that live in the sargassum are colored like the plant and cannot be seen unless a false movement or the shine

Sargassum-fish

Reproduction of strange denizen of the sea, on exhibition in Albert W. Harris Hall.

of an eye betrays them. The sargassum-fish has a very large mouth and can readily swallow a crab or another fish as large as itself.

When the eggs of the sargassum-fish are laid, they float on the surface of the water for a few days until they hatch. Then the tiny young fish swim around until they reach a mass of the weed where they can find food and shelter. In their bushy homes they are great travelers. In the Atlantic they have been seen on the shores of Norway, central Africa, Massachusetts, and southern Brazil. In the Pacific and Indian Oceans they are found on the shores of Africa, Australia, and Japan. The cold currents seem to keep them away from the west coast of America.

A celluloid model of the sargassum-fish has been prepared by Staff Taxidermist A. G. Rueckert from a specimen collected at Key West, Florida, by the John G. Shedd Aquarium and presented to Field Museum. It is now on exhibition in Albert W. Harris Hall (Hall 18).

New Books in Library

The Library of Field Museum calls attention to the following publications, recently added to its collections, which contain material of interest to general readers: Bolton, *Anza's California Expeditions* (five volumes); Bailey, *Phases in the Religion of Ancient Rome;* Russell, *Plant Nutrition and Crop Production;* and Nilsson, *Mycenaean Origin of Greek Mythology.* These, and other scientific works in the Library's collection of some 95,000 volumes, may be consulted by Members of the Museum and by the general public. The reading room is open from 9 A.M. to 4:30 P.M. from Monday to Friday, and from 9 A.M. to noon Saturday. It is closed on Sunday.

PRINCE M. U. M. SALIE PRESENTS GEMS FROM CEYLON

A valuable collection of precious stones of many varieties, brought from the island of Ceylon, which is known as the home of fine gems, has been presented to Field Museum by Prince M. U. M. Salie, well-known Ceylonese gem merchant. There are fifty-five stones in the collection, including a number of rare specimens. They will be distributed according to their classifications among the exhibits in H. N. Higinbotham Hall (Hall 31) at an early date.

Outstanding in beauty and interest in the collection are sapphires, star sapphires, rubies, a star ruby, aquamarines of remarkable fire and color, moonstones, and an Oriental amethyst sapphire. The collection covers the range of all the more important stones found in Ceylon, and embraces every hue from colorless through the whole spectrum from red to violet. In a number of cases there are several stones of one basic kind but differing in color, showing the variety of tints possible in high class gems of a single species.

Most fascinating and most sought after, in the experience of Prince Salie, are the star sapphires, for which Ceylon is particularly noted. These occur in various colors from light gray to deep blue and lavender. When found in deep red, which is rare, they are called star rubies and are of higher value. The star sapphire or ruby, when placed in the light, shows a luminous six-pointed star at every angle of vision. Among the star sapphires Prince Salie has presented to the Museum are a large one of sixty carats, and one of the rare star rubies.

Another unusual ruby included in the gift is one which combines the perfection of color of the Burmese type with the sparkling fire of the Ceylonese. The moonstones in the collection are remarkable for possessing a more pronounced moonlight sheen than is usually seen, and in the case of some upon which faces have been carved this produces a particularly striking effect.

Besides the gems mentioned above, Prince Salie's gift includes a "cat's-eye" (treasured by Indian rulers as a legendary jewel and often mounted in the crowns of princes and rajahs), pink star sapphires, brown, white, and blue zircons, spinel ruby, carved sapphire, carved ruby, cinnamon stones, water sapphires, fancy sapphire, parparagum, jargoon, peridot, pink topaz, golden sapphires, and other stones.

Prince Salie's family for generations has been engaged in the mining, cutting, and merchandising of precious stones. He began his work in this field some forty years ago at the age of fourteen. He has a large and unusual exhibition of gems on view at A Century of Progress, in the General Exhibits Building, Pavilion 4, Second Floor. Many of the stones he has on display there have been awarded highest honors at other international fairs, including those of Christ Church, New Zealand, in 1906, Panama Pacific International Exposition in San Francisco in 1915, Panama California International Exposition in San Diego in 1916, and the Sesquicentennial Exposition in Philadelphia in 1926. Prince Salie's home is at Galle, Ceylon. He maintains permanent American headquarters at Miami Beach, Florida. In recognition of his gift, Prince Salie has been elected to the class of Museum membership designated as Contributors.

A group of Alaska water birds from the Pribilof Islands forms an attractive exhibit in the Department of Zoology.

AUTUMN LECTURE COURSE TO OPEN OCTOBER 7

Field Museum's Sixtieth Free Lecture Course will begin on Saturday, October 7, and continue on Saturday afternoons through October and November. In all, eight travel lectures, illustrated with motion pictures and stereopticon slides, will be given. All the lectures will be presented in the James Simpson Theatre of the Museum, and all will begin at 3 P.M. Following is the complete schedule of dates, subjects and speakers:

October 7—The Desert Road to Turkistan
Owen Lattimore, Washington, D.C.

October 14—Jungle Islands of the South Seas
Sidney Shurcliff, Boston, Massachusetts

October 21—Gorillas
Harry C. Raven, American Museum of Natural History, New York

October 28—My Life as an Indian Chief
Walter McClintock, Pittsburgh, Pennsylvania

November 4—The Spell of Egypt
H. C. Ostrander, Jersey City, New Jersey

November 11—Republics in the Clouds—Ecuador, Peru, Bolivia
Major James C. Sawders, Nutley, New Jersey

November 18—By Way of Cape Horn
Alan J. Villiers, Melbourne, Australia

November 25—Amazon Twilight
Earl Hanson, Carnegie Institution, Washington, D.C.

No tickets are necessary for admission to these lectures. A section of the Theatre is reserved for Members of the Museum, each of whom is entitled to two reserved seats on request. Requests for these seats may be made by telephone or in writing to the Museum, in advance of the lecture, and seats will then be held in the Member's name until 3 o'clock on the day of the lecture. Members may obtain seats in the reserved section also by presentation of their *membership cards* to the Theatre attendant before 3 o'clock on the lecture day, even though no advance reservation has been made. All reserved seats not claimed by 3 o'clock will be opened to the general public.

MOTION PICTURES FOR CHILDREN —RAYMOND FOUNDATION

Nine free motion picture programs for children will be presented on Saturday mornings from October 7 to December 2, inclusive, in the autumn series of entertainments provided by the James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures. These will be given in the James Simpson Theatre of the Museum, and each will be presented twice, at 10 A.M. and 11 A.M. Children from all parts of Chicago and suburbs are invited.

Following is the schedule showing the titles of the films to be shown on each date:

October 7—Hawaii, the Beautiful; Kilauea, the Volcano; Earthquakes; Whitetail, the Deer

October 14—Heroes of the Sea; Columbus

October 21—Animals in Motion; Glimpses of Tibetan Life; Strange Tibetan Dances; Moose—King of the Forest

October 28—Simba

November 4—Hunting Dinosaurs; The Romance of Glass

November 11—The Frog; The Ants' Cow; The Mystery Box; From Dog to Airplane

November 18—Musk Ox and Polar Bear; The Sky Splitter; Comets and Eclipses

November 25—A Furry Tale; The Puritans

December 2—Through the Year with Animal Friends: Spring; Summer; Autumn; Winter

CHINESE GATEWAY FOR SALE

Due to lack of a suitable place in Field Museum in which to exhibit it, the famous Chinese gateway in the possession of this institution is being offered for sale. The attention of other museums, societies, and individual art collectors is called to this remarkable opportunity to acquire a rare and valuable addition to their collections, outstanding for its artistic beauty and its impressive size. The gateway at present is to be seen standing in front of the Chinese

Chinese Gateway

This remarkable example of Chinese art, carved from teakwood, is 19 feet high and 16 feet 9 inches in breadth.

Exposition on the grounds of A Century of Progress, where it has attracted much attention from world's fair visitors all summer. It is carved from teakwood, and is 19 feet in height and 16 feet 9 inches in width. It was first brought to this country from China for exhibition in the Palace of Education at the Panama Pacific International Exposition of San Francisco in 1915. A complete description of the gateway, and an interpretation of the many remarkable carved figures which decorate it, may be obtained from Field Museum Anthropology Leaflet No. 1 entitled "The Chinese Gateway," written by Dr. Berthold Laufer, Curator of Anthropology. Copies of this leaflet will be sent free, upon request, to any institution or individual interested in the possibility of purchasing the gateway.

SPECIAL NOTICE

All Members of Field Museum who have changed their residences or are planning to do so are earnestly urged to notify the Museum at once of their new addresses, so that copies of FIELD MUSEUM NEWS and all other communications from the Museum may reach them promptly.

Fossils Collected in New Jersey

Sharat K. Roy, Assistant Curator of Invertebrate Paleontology, spent the month of September on a field trip in the region near Dover, New Jersey, where he collected fossils of Cambrian age for addition to the Museum's collections.

OCTOBER GUIDE-LECTURE TOURS

Conducted tours of exhibits, under the guidance of staff lecturers, are made every afternoon at 3 P.M., except Saturdays, Sundays, and certain holidays. Following is the schedule of subjects and dates for October:

Week beginning October 2: Monday—Eskimo Life; Tuesday—General Tour; Wednesday—African Animals; Thursday—General Tour; Friday—Seeds and Fruits.

Week beginning October 9: Monday—Animals and Plants of Long Ago; Tuesday—General Tour; Wednesday—Egyptian Exhibits; Thursday—General Tour; Friday—Costumes of Primitive Peoples.

Week beginning October 16: Monday—Fishes, Amphibians and Reptiles; Tuesday—General Tour; Wednesday—Hall of Plant Life; Thursday—General Tour; Friday—Man Through the Ages.

Week beginning October 23: Monday—South American Plants and Animals; Tuesday—General Tour; Wednesday—Chinese and Tibetan Art; Thursday—General Tour; Friday—Crystals, Gems and Jewelry.

Monday, October 30—Habitat Groups; Tuesday—General Tour.

Persons wishing to participate should apply at North Entrance. Tours are free and no gratuities are to be proffered. A new schedule will appear each month in FIELD MUSEUM NEWS. Guide-lecturers' services for special tours by parties of ten or more are available free of charge by arrangement with the Director a week in advance.

Gifts to the Museum

Following is a list of some of the principal gifts received during the last month:

From Dr. Florentino Felippone—a red bat, Uruguay; from Homer Forbis—5 hair-worms, Missouri; from Frederick H. Test—2 rodent skins with skulls, and 12 bats, Honduras; from Dr. John A. Elliott—a hog-nosed snake, Illinois; from F. J. W. Schmidt—4 anakes and a turtle, Wisconsin; from Russell T. Neville—a lizard, 3 frogs, 4 bats, and 4 salamanders, Missouri; from Thomas K. Birks—a tiger salamander, Wisconsin; from C. C. Liu—22 toads, China; from Wesley Lee Laybourne—a northern water snake, Illinois; from Treville Lawrence—a black vulture skeleton, Georgia; from F. D. Flanders—a molar tooth of *Elephas imperator*, Texas; from A. C. Jones—2 cerussite and 2 wulfenite specimens, Ontario; from Dr. T. F. Seymour—4 specimens of free gold in matrix, Arizona; from John W. Jennings—specimens of jasper and chalcedony, Arkansas; from William B. Pitts—a mineral specimen and 14 polished agate specimens, California; from C. N. Ackerman—a skull and one-half skeleton of *Bison americanus*, Illinois; from Prince M. U. M. Salie—55 precious stones, Ceylon; from School of Forestry, Yale University—75 herbarium specimens, British Honduras; from Alexander E. Lawrance—200 herbarium specimens, Colombia; from Museo Nacional—23 herbarium specimens, Costa Rica; from Professor A. O. Garrett—78 herbarium specimens, Utah; from Companhia Ford Industrial do Brasil—52 wood and herbarium specimens, Brazil; from Mrs. E. A. Talcott—a lignum vitae ruler; from H. G. Moore—5 musical instruments, Africa, Jerusalem, and Constantinople; from Karl P. Schmidt—3 pre-Columbian clay heads, Santo Domingo.

NEW MEMBERS

The following persons were elected to membership in Field Museum during the period from August 16 to September 15:

Annual Members

Miss Madelyn M. Bader, Mrs. Alfred S. Burdick, John W. Denison, George G. Goldie, Mrs. Charles E. Goodell, William A. Gray, Frank J. Hurley, Arthur J. G. Illian, William P. Kelly, Clarence E. Kohl, Mrs. O. T. Kreusser, T. J. Reed, Mrs. Bertram M. Winston.

An unusually large specimen of sagebrush, about six feet high and six feet around, is on exhibition in the Hall of Plant Life. This bush, widely found in the west, was an important item in the life of the pioneers, who used it for fuel.

The origin and uses of jet or "black amber" are explained by an exhibit in the Department of Geology.

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MAGDALENIAN SCULPTURE AND CAP-BLANC SKELETON IN THE STONE AGE HALL

By Henry Field
Assistant Curator of Physical Anthropology

The fifth* group in the Hall of the Stone Age of the Old World (Hall C) shows a reproduction of the most important sculpture of the Magdalenian period—the frieze of horses in the rock-shelter of Cap-Blanc in the Dordogne region of France.

In 1865 Lartet and Christy excavated the great rock-shelter of La Madeleine, Dordogne, where they found evidence of a prehistoric culture, subsequently called the Magdalenian. During the period in which that culture flourished in Europe, some 20,000 years ago, the climate was cold. The mammoth, woolly rhinoceros, reindeer, musk-ox, bison, wild horse and many other animals wandered across the meadows. Cave-bears struggled with the ancient hunters for possession of the caves.

The Magdalenians, who were members of the Cro-Magnon race, had long, narrow heads with high cheek-bones, a combination which is known as the "disharmonic" type. The brow-ridges were well developed above large, rectangular eye sockets. Medium in stature, with well-shaped heads and pleasing features, they must have been imposing. The Magdalenian artists produced the finest naturalistic art of prehistoric times. The advanced flint-flaking technique of their Solutrean predecessors disappeared, but the working of bone became a highly developed art and a strong influence in the life of the people. Their weapons included spear-throwers and harpoons of various types, while bone needles and awls were important articles of domestic equipment. In order to light the caves in which they lived and practiced their art, animal fat was burned in crude stone lamps.

In the Museum group an accurate reproduction of the Cap-Blanc rock-shelter shows part of the magnificent frieze of Celtic horses cut in high relief on the wall. This illustrates the remarkable sculptural attainments of the Magdalenian artists. The landscape painted by Staff Artist Charles A. Corwin shows the location of this rock-shelter above the valley of the meandering Beune River.

In the foreground of the group a modern skeleton has been placed in the position in which the bones of a young Magdalenian girl were found during excavations in 1911. The original Cap-Blanc skeleton, purchased in 1926 from M. Grimaud, is on exhibition in an adjoining case. The skull and pelvis, which had been crushed by overlying rocks, have been restored by T. Ito under the direction of Dr. Gerhardt von Bonin and the writer. The bones showed no signs of disease. From the condition of the teeth and long bones, as revealed by X-ray photographs, it is estimated that this girl was about eighteen years of age. An ivory point, found over the abdominal cavity, may have been the cause of death.

The reproduction of the rock-shelter is the work of Frederick Blaschke, who visited Cap-Blanc in 1927 in order to make an accurate scale model of the frieze. Henri Barrèyre took motion and still pictures of the site, and colored sketches and paintings were made by Charles R. Knight and Pierre Gatier.

The group was planned and directed by the writer with the generous cooperation of Abbé Henri Breuil, the leading authority on prehistoric art, who is a professor at the Collège de France and a Corresponding Member of Field Museum.

Magdalenian Achievements in Sculpture

The Cap-Blanc rock-shelter, with its famous frieze of horses carved in the limestone wall by prehistoric men some 20,000 years ago, as reproduced in the Hall of the Stone Age. In the foreground is a human skeleton placed exactly in the position in which the original prehistoric one, shown in adjoining case, was found on this site.

*The first four groups, Chellean, Neanderthal, Aurignacian and Solutrean, have been pictured and described in the July, August, September and October issues of Field Museum News.

Hall 24 Reinstallation Completed

With the reinstallation recently of the collection of rhinoceros horn cups, the Chinese archaeological collections in George T. and Frances Gaylord Smith Hall (Hall 24), which have been undergoing thorough revision and improvement for more than a year, are now completely reinstalled. The new method of lighting the cases with concealed illumination, and the new buff-colored screens and labels, greatly enhance the beauty of the exhibits and make them much easier to study.

Invertebrate Fossils Collected

An important collection of invertebrate fossils, ranging from the Cambrian to the Cretaceous period, has been received at the Museum as the result of a field collecting trip in Pennsylvania, New Jersey, and New York, recently completed by Sharat K. Roy, Assistant Curator of Invertebrate Paleontology. Mr. Roy was accompanied by Floyd Markham of Chicago, who rendered valuable assistance in assembling the collection. Of special interest are complete specimens, particularly from Cambrian localities, where hitherto only fragmentary fossils had been known to occur.

New Bronzes Added to Keep Hall

Three more bronzes of racial types, by the sculptor Malvina Hoffman, have been added recently to the seventy-four which occupied Chauncey Keep Memorial Hall (Hall 3) when it opened in June, bringing the series a step nearer to completion. The new types are a Yucatecan Maya of Mexico, a Tehuelche of Patagonia, and a Georgian of the Caucasus.

Flora of Barro Colorado

Based primarily upon collections in the Herbarium of Field Museum, *The Flora of Barro Colorado Island, Panama* has been published as No. 5 of the Contributions from the Arnold Arboretum of Harvard University. Paul C. Standley, Associate Curator of the Herbarium of Field Museum, is the author. The pamphlet contains 178 pages, a map, and twenty-one heliotype plates, and it enumerates 1,259 species of plants. This is a surprisingly large total, even in the tropics, for an area as small as Barro Colorado, an island of only some six square miles. The island is in Gatun Lake in the Panama Canal, and is the site of a laboratory maintained by the Institute for Tropical Research of the National Research Council. Mr. Standley has made several visits to Barro Colorado.

Field Museum of Natural History

Founded by Marshall Field, 1893

Roosevelt Road and Lake Michigan, Chicago

Field Museum is open every day of the year during the hours indicated below:

November, December, January	9 A.M. to 4:30 P.M.
February, March, April, October	9 A.M. to 5:00 P.M.
May, June, July, August, September	9 A.M. to 6:00 P.M.

Admission is free to Members on all days. Other adults are admitted free on Thursdays, Saturdays and Sundays; non-members pay 25 cents on other days. Children are admitted free on all days. Students and faculty members of educational institutions are admitted free any day upon presentation of credentials.

The Museum's natural history Library is open for reference daily except Saturday afternoon and Sunday.

Traveling exhibits are circulated in the schools of Chicago by the N. W. Harris Public School Extension Department of the Museum.

Lectures for schools, and special entertainments and tours for children at the Museum, are provided by the James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures.

Announcements of free illustrated lectures for the public, and special lectures for Members of the Museum, will appear in Field Museum News.

A cafeteria in the Museum serves visitors. Rooms are provided for those bringing their lunches.

Chicago Motor Coach Company No. 26 buses go direct to the Museum.

Members are requested to inform the Museum promptly of changes of address.

MEMBERSHIP IN FIELD MUSEUM

Field Museum has several classes of Members. Benefactors give or devise $100,000 or more. Contributors give or devise $1,000 to $100,000. Life Members give $500; Non-Resident Life and Associate Members pay $100; Non-Resident Associate Members pay $50. All the above classes are exempt from dues. Sustaining Members contribute $25 annually. After six years they become Associate Members. Annual Members contribute $10 annually. Other memberships are Corporate, Honorary, Patron, and Corresponding, additions under these classifications being made by special action of the Board of Trustees.

Each Member, in all classes, is entitled to free admission to the Museum for himself, his family and house guests, and to two reserved seats for Museum lectures provided for Members. Subscription to Field Museum News is included with all memberships. The courtesies of every museum of note in the United States and Canada are extended to all Members of Field Museum. A Member may give his personal card to non-residents of Chicago, upon presentation of which they will be admitted to the Museum without charge. Further information about memberships wul be sent on request.

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EXPEDITION TO THE SOUTHWEST RETURNS WITH COLLECTIONS

By Paul S. Martin

Assistant Curator of North American Archaeology

The Field Museum Archaeological Expedition to the Southwest has returned from its third and most successful season at the Lowry ruin in southwestern Colorado.

This site was formerly inhabited by Pueblo Indians. The structure, containing many contiguous rooms, was built on top of a mesa situated between two canyons. It stands today, even in its ruined state, an imposing mound about twenty-five feet above the level of the surrounding country. The known length of the ruin is 175 feet, but there are many rooms at both ends and on each side yet to be excavated. Twenty-eight ground-floor rooms have been entirely dug out. It seems certain that most of the pueblo was three stories high, hence it may safely be assumed that there were at least from seventy-five to eighty rooms in the portion which has been investigated.

On Lowry Mesa there is a condition similar to that found at Troy, namely, a village built on the remains of others. The Museum expedition has found evidence of five separate occupations of this mesa. During the last one the large stone-walled pueblo was commenced. The evidence indicates that even during the final occupation there were an ebb and flow of peoples, and that there were at least five distinct building periods in what we now call Lowry pueblo.

It might be of interest to explain for those who have not visited such a site how these conclusions are reached. The first steps in the work consist of careful trenching on all sides of the pueblo and outside of what seem to be the exterior walls. This work may bring to light many puzzling features, which at the moment cannot be understood, but perhaps may be interpreted later in the light shed as more information is obtained. For example, three years ago in the preliminary trenching several apparently disconnected walls and two kivas (underground, circular ceremonial chambers) were encountered. At that time, those features, especially the walls, meant nothing, because they were apparently just orphan walls without any near relatives or ancestors. It has now been determined that those very walls formed part of the one-story terrace of the pueblo and are still connected with what the writer once thought was the main section of the village.

The conclusion that there were at least five building periods during the last occupation of Lowry ruin was reached by a close study of the masonry and by noting whether the corners of the walls are tied or abutted. A tied corner is one in which the stones of the two walls are interlaced so as to bind them together securely. An abutted corner is one in which a later wall touches an earlier one. Careful study of these factors indicates that Lowry pueblo began with perhaps eight or ten rooms; that it was abandoned and reoccupied several times; and that at least five additions and alterations were made, so that the maximum number of rooms was probably about two hundred.

On and under the floors of the rooms many interesting specimens came to light. Under one room, for example, were found eight well-made bone tools, a beautiful green stone implement, which was probably ceremonial in nature, and two wooden artifacts, the use of which is problematical. These objects had been wrapped in a cedar-bark matting, badly rotted when discovered this year. They were buried under the floor by some prudent Indian, who probably placed them there for safe-keeping. Three dog skeletons interred within the walls of the pueblo were likewise uncovered and brought back to the Museum for examination. A great deal of excellent pottery was found. Pottery is very important to the archaeologist, because by studying its texture, color, and design he can generally determine changes and sequences of culture, and can also work out the relation of one pueblo to another. During the past season, the Museum expedition dug up thirty pieces of pottery and approximately eight hundred potsherds, which are valuable for study, as well as many bone and stone tools.

A system of determining by the rings of a section of trunk the dates of cutting of certain species of trees used by the Indians as roof beams and door lintels, has recently been developed by Dr. A. E. Douglass of the University of Arizona. The earliest known date of Lowry ruin is A.D. 894, but an earlier one may be obtained, as more than twenty log specimens from various rooms were secured this summer.

The Southwest Expedition is financed from funds provided by the late Julius and Augusta N. Rosenwald.

Colored Agate

Frequent inquiries are received from Museum visitors about methods of coloring agate. The natural colors of most agate are pale, so that the beauty of the stone is enhanced by artificial coloring. This is accomplished by soaking the stone for days or even weeks in a suitable solution. Agate is composed of layers of differing degrees of porosity which absorb different quantities of the solution and so are stained in contrasting shades. The solutions commonly used are honey or sugar in water. After treatment with the sugar solution the agate is treated with strong sulphuric acid which chars the sugar, producing various shades of brown and dull red. There are other solutions which deposit pigments in the pores of the agate. Of late years many agates are colored with aniline dye but these are not highly esteemed.

A large selection of colored and uncolored agate appears in a case at the entrance to Hall 34.

Exhibit of Shore Birds

The principal species of American shore birds are on exhibition in a case recently installed in Hall 21, containing the systematic collection of birds. Included in this exhibit are the rails, sandpipers, snipe, woodcock, oystercatchers, plovers, stilts, avocets, jacanas, turnstones, and phalaropes. A curious characteristic of the phalaropes is that, unlike most birds, the female is more beautiful than the male. Also, a matriarchal plan of living prevails among them, the males attending to the duties of incubating the eggs and caring for the young when hatched. The plovers are of special interest because of the large size of their eggs as compared with the size of the birds. The snipe and woodcock are among the favorite game birds of sportsmen. The birds were mounted by Ashley Hine, Staff Taxidermist.

Museum Hours Now 9 to 4:30

Effective November 1, and continuing until February 28, Field Museum resumes its regular winter visiting hours, opening daily at 9 A.M., and closing at 4:30 P.M.

A ninety-pound topaz crystal is on exhibition in H. N. Higinbotham Hall (Hall 31).

COLORADO EXPEDITION UNEARTHS RARE FOSSIL SPECIMENS

A valuable collection of fossil mammals and reptiles has been brought to Field Museum by Bryan Patterson, Assistant in Paleontology in the Department of Geology, who has returned from an expedition conducted under his leadership in western Colorado during the past summer. Mr. Patterson was accompanied by James H. Quinn and Clayton A. Quinn.

Among the specimens obtained are skulls and parts of the skeleton of an animal that has hitherto been one of the rarest of fossil mammals. This creature, known as *Titanoides*, is a representative of the Amblypoda, an extinct order of primitive hoofed mammals. The history of the discovery of the animal is an example of the slow growth of our knowledge of fossil vertebrates, according to Elmer S. Riggs, Associate Curator of Paleontology.

In 1917 *Titanoides* was named on the basis of a fragment of lower jaw from North Dakota. In 1930 other fragments of lower jaw were described from Wyoming. In 1931 there was presented to the Museum, by E. B. Faber of Grand Junction, Colorado, another broken lower jaw which he had found in his vicinity.

As a result of the interest aroused by these specimens, a party from the Museum visited this region in the summer of 1932. The collections obtained, consisting of lower jaws, a distorted skull, and leg and foot bones, added to the knowledge of the animal's structure, but were insufficient to permit an adequate conception of the entire skeleton. With the specimens just secured it is hoped that it will now be possible to add a mounted skeleton of *Titanoides* to the Museum's exhibition series.

BIRDS-OF-PARADISE

By Rudyerd Boulton
Assistant Curator of Birds

It is a far cry from a somberly hued raven to an exotic king bird-of-paradise, yet these two birds are really first cousins. The family of ravens, crows, and jays has a world-wide range, while birds-of-paradise are found only in New Guinea and near-by islands. They are well named, for in many respects they are not exceeded by any other group of birds for sheer beauty and intricate ornamentation. The first specimens of these birds to reach Europe lacked the wings and feet. Legends arose that the beautiful plumes of the flanks supported them in the air, and that they needed no feet for they spent their lives in flight, continually turning their breasts to the sun.

Field Museum has recently placed on exhibition in the systematic series of exotic birds in Hall 21 a screen showing paradise birds together with some of their nearest relatives. Crows and jays, because of their close relationship, are well represented by specimens from every part of their world-wide range. Chickadees, creepers, and nuthatches are families of more distant kinship that fit into the complicated scheme of the evolution of this group of birds. At the other end of the series, orioles from the Old World, drongos from India and cuckoo-shrikes from Malaysia complete the picture of the relationships of these birds. All of them are true song birds, and while they compose the most highly specialized major group, they are relatively low down in the scale of evolution. The most primitive members of the group, larks and swallows, are shown near-by.

While crows and jays have become adapted to living under all sorts of conditions and in all parts of the world, the same tendency towards specialization has caused paradise birds to develop fantastic courtship dances and complicated ornamental plumes. Prince Rudolph's blue bird-of-paradise is shown in courtship display, the delicate form of its nuptial plumes bearing marvelous pastel shades of blue, mauve, lilac, and maroon. During the display, which lasts for several minutes, it swings upside down from a branch, quivering its plumes in an ecstasy of sheer abandon (*see accompanying illustration*). Other resplendently beautiful specimens are the gorgetted, the king, the superb, the magnificent and the great bird-of-paradise.

Many of Field Museum's expeditions of recent years have contributed specimens to this exhibit. Among them are the Crane

Blue Bird-of-Paradise

This, the most ornate species of all, shown in full nuptial display, hanging upside down on a branch, its habitual position during courtship.

Pacific Expedition, the Kelley–Roosevelts Asiatic Expedition, the Suydam Cutting Sikkim Expedition and the *Chicago Daily News* Abyssinian Expedition.

John W. Moyer of the Museum's taxidermy staff prepared the exhibit.

MUSEUM READY TO DISPOSE OF SURPLUS TOTEMS

Its own exhibited collection complete with some thirty totems displayed in Hall 10, Field Museum is able to offer at this time a rare opportunity to other institutions or private collectors to obtain original totem poles, potlatch figures, and houseposts of the Northwest Coast Indians. The Museum has about a dozen extra examples which, on account of lack of space, cannot be exhibited. As the Canadian government now has an export ban on these objects, the Museum's surplus collection comprises probably all the specimens now obtainable in this country.

These totems have been on exhibition this summer at the American Indian Village at A Century of Progress Exposition. They are all excellent specimens, well preserved, and most of them are probably more than one hundred years old. They range from six and one-half feet to forty-eight feet in height. Among the tribes whose work is represented are the Kwakiutl and Haida.

Negotiations are solicited regarding the disposal of these objects. Any institution or individual desiring further information is invited to communicate with the Director of Field Museum.

LARGE AUSTRALIAN COLLECTION PLACED ON EXHIBITION

By Wilfrid D. Hambly
Assistant Curator of African Ethnology

What is probably the largest and most complete collection in this country representing the ethnology of the aboriginal tribes of Australia has just been placed on exhibition, for the first time, in Hall A1.

The Australian aborigines, numbering about 50,000 people scattered over a continent as large as the United States, are of special interest because they are still living in a stone age state of culture, lacking all knowledge of the use of metals.

The Australian tribes make no pottery, have no musical instruments, wear no clothing, and have no dwelling houses except temporary shelters. However, they show a remarkable ingenuity in manufacturing tools, weapons and ornaments from stone, bone, wood, sinew and gum.

As illustrated in the Museum collection, stone, and even bottle glass when available, are chipped and flaked into spearheads of narrow leaf shape, with small serrations. The flaking of these regular notches, which look like the fine teeth of a saw, calls for the highest skill. For carving wooden spears, some of which are elaborately barbed, stone implements are used, and tools of the same kind are employed for shaping boomerangs, clubs and spear-throwers—wooden devices used to extend the length of the arm and give greater power to the thrust of a spear.

Boomerangs in the exhibit demonstrate that, contrary to popular belief, the well-known returning boomerang, which is made with a twist, is only a plaything, rather than a weapon, whereas the form used in hunting and warfare is of the non-returning variety, which is flat.

Personal ornament is of a simple kind. It consists of opossum and kangaroo sinew, along with shredded bark and human hair, all of which are plaited into objects for wear upon the neck, arms and forehead. Usually these ornaments, and in fact most other objects as well, are rubbed with red ocher. Shells and brightly colored seeds are popular for decoration. Several handsome strings of small blue shells such as were worn by the extinct Tasmanians, are on exhibition.

Magic plays an important part in the lives of Australian aborigines, as is illustrated in the Museum exhibit by a number of "pointing sticks" and "pointing bones" which, when secretly jabbed in the direction of an enemy who is meanwhile cursed, are believed actually to enter his body. Also shown are shoes made of emu feathers, which are believed to be magically potent in leading the wearer on the track of his enemy.

Ghosts are greatly feared, and because the belief prevails that disembodied spirits haunt the living to observe whether the mourning ceremonies are carefully carried out, widows are required to sit for days beside the grave of a deceased husband. As the people are polygamous, several widows may be found at one man's grave. They shave their heads and cover their bodies with white clay. Daily they give a covering of lime to their heads, which in the course of weeks accumulates into a heavy widow's cap, an excellent example of which is shown in the exhibit.

Other features of the exhibit include message sticks carried by messengers to serve as passports when traveling in the territory restricted to tribes other than their own, a totem pole wound around with down and human hair, shields, spears, implements, and other artifacts.

FOUR MORE LECTURES IN AUTUMN COURSE

Four more lectures in Field Museum's Sixtieth Free Lecture Course remain to be given on Saturday afternoons during November. These lectures, illustrated with motion pictures and stereopticon slides, are presented in the James Simpson Theatre of the Museum, and all begin at 3 P.M. Following are the dates, subjects and speakers:

November 4—The Spell of Egypt
H. C. Ostrander, Jersey City, New Jersey

November 11—Republics in the Clouds—Ecuador, Peru, Bolivia
Major James C. Sawders, Nutley, New Jersey

November 18—By Way of Cape Horn
Alan J. Villiers, Melbourne, Australia

November 25—Amazon Twilight
Earl Hanson, Carnegie Institution, Washington, D.C.

No tickets are necessary for admission to these lectures. A section of the Theatre is reserved for Members of the Museum, each of whom is entitled to two reserved seats on request. Requests for these seats may be made by telephone or in writing to the Museum, in advance of the lecture, and seats will then be held in the Member's name until 3 o'clock on the day of the lecture. Members may obtain seats in the reserved section also by presentation of their *membership cards* to the Theatre attendant before 3 o'clock on the lecture day, even though no advance reservation has been made. All reserved seats not claimed by 3 o'clock will be opened to the general public.

CHILDREN'S MOTION PICTURES —RAYMOND FOUNDATION

Of the autumn series of entertainments for children provided by the James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures, five more remain to be given on Saturday mornings from November 4 to December 2 inclusive. The programs are presented in the James Simpson Theatre of the Museum, and each is given twice, at 10 A.M. and 11 A.M. Admission is free. The films to be shown on each date are listed below:

November 4—Hunting Dinosaurs; The Romance of Glass

November 11—The Frog; The Ants' Cow; The Mystery Box; From Dog to Airplane

November 18—Musk Ox and Polar Bear; The Sky Splitter; Comets and Eclipses

November 25—A Furry Tale; The Puritans

December 2—Through the Year with Animal Friends: Spring; Summer; Autumn; Winter

AN AQUATIC AROID

By B. E. Dahlgren
Acting Curator, Department of Botany

The well-known Indian turnip and the skunk cabbage figure in our woods as rather isolated representatives in the temperate zone of a large group of plants that reaches its highest development in the moist tropics. The cultivated calla lily, the caladiums, and the elephant ears are other familiar, though exotic, members of the plant family, Araceae, which in common botanical and horticultural parlance is known as the "aroids," aroid meaning arum-like.

The chief features which the aroids have in common are well illustrated by the calla lily with its showy spike or spadix set with minute, inconspicuous flowers, usually lacking petals and sepals. This lack is compensated for by the presence of a large sheathing spathe at the base of the entire spadix. In the calla lily this spathe is white, in other aroids it is green or spotted, in still others brilliant scarlet in color.

The aroid family is very large. Among its many genera and their numerous species there are found many variations on this characteristic floral structure, just as there are a large range and variation in the shape and size of the leaves of these plants. In some aroids the flowering spike is so small and inconspicuous that only a careful search will reveal its presence; in some others the spadix is astonishingly large. It may be as tall as a man, thicker than a man's arm.

What is most remarkable about these plants is their diversity of habit. They include at least one floating aquatic, *Pistia*, the water cabbage, many swamp plants like the calamus, and numerous climbers and epiphytes. The latter sometimes begin life as climbers, then lose all connection with the ground and continue to grow as

Aninga Plant

An aquatic calla lily which grows in profusion along the banks of the Amazon. This exhibit in the Hall of Plant Life was prepared by the Stanley Field Plant Reproduction Laboratories.

air plants, or put forth roots that may reestablish contact with the soil. Others begin their existence as epiphytes in the tree tops and only much later reach the ground with their pendent roots.

Several of the aroids on the order of the elephant ears furnish edible tubers of large size. The most important of these, the taro, is the chief starch plant of the entire Polynesian region. The eddo of the West Indies is one of several American relatives that yield similar edible tubers.

One of the best known of ornamental greenhouse plants is a large climber with perforated leaves and edible fruit, *Monstera deliciosa*, which is represented in the Hall of Plant Life (Hall 29). A recent addition to this hall is a large aquatic aroid, a kind of aquatic calla lily, *Montrichardia*, of tropical America. It is known in British Guiana as mucca-mucca; in the Amazon region it is called aninga. This aquatic is a common sight in northern South America, where it forms large patches or solid stands fringing the muddy river margins in five or six feet of water. Its tapering stem, which may grow to ten feet or more in height, is only a few inches thick in its upper part but enlarges rapidly toward the base where it may be from eight inches to a foot in diameter. Its young shoots and large compound fruits appear to be the favorite food of the hoatzin, the primitive claw-winged, crested bird called canje pheasant in Guiana, and cigana in the lower Amazon.

NOVEMBER GUIDE-LECTURE TOURS

Conducted tours of exhibits, under the guidance of staff lecturers, are made every afternoon at 3 P.M., except Saturdays, Sundays, and certain holidays. Following is the schedule of subjects and dates for November:

Wednesday, November 1—Egyptian and Etruscan Burials; Thursday—General Tour; Friday—Races of Mankind.

Week beginning November 6: Monday—Animal Life in Cold Lands; Tuesday—Lacquer, Rubber and Turpentine; Wednesday—Peoples of the South Seas; Thursday—General Tour; Friday—Primitive Musical Instruments.

Week beginning November 13: Monday—Prehistoric Plants and Animals; Tuesday—Looms and Textiles; Wednesday—Halls of Plants and Their Uses; Thursday—General Tour; Friday—North American Archaeology.

Week beginning November 20: Monday—Indians of Plains and Deserts; Tuesday—Skeletons, Past and Present; Wednesday—Crystals of Economic and Decorative Value; Thursday—General Tour; Friday—Trees and Wood Products.

Week beginning November 27: Monday—Asiatic Animal Life; Tuesday—Men of the Stone Age; Wednesday—Winter Birds of the Chicago Region; Thursday—Thanksgiving holiday, *no tour.*

Persons wishing to participate should apply at North Entrance. Tours are free and no gratuities are to be proffered. A new schedule will appear each month in FIELD MUSEUM NEWS. Guide-lecturers' services for special tours by parties of ten or more are available free of charge by arrangement with the Director a week in advance.

Gifts to the Museum

Following is a list of some of the principal gifts received during the last month:

From Museo Nacional—183 herbarium specimens, Costa Rica; from Van Cleef Brothers—12 specimens of rubber material, Sumatra; from Professor Martin Cárdenas—50 specimens of plants, Bolivia; from Ford Motor Company—8 planks of Tapajos woods, Brazil; from Companhia Ford Industrial do Brasil—45 herbarium specimens and 34 wood specimens, Brazil; from Rev. Brother Elias—97 herbarium specimens, Colombia; from Desert Laboratory of Carnegie Institution of Washington—185 herbarium specimens, Arizona and Sonora; from C. H. Mueller—460 herbarium specimens, Nuevo León; from John W. Jennings—a specimen of jasper, Arkansas; from Arthur J. Lay—2 fluorspar specimens, Illinois; from Charles Maricott—14 specimens claystones, Michigan; from B. E. and Frances C. Axe—a gold nugget, Yukon Territory, Canada; from O. J. Dowling—3 specimens sylvite, New Mexico; from James H. Quinn—2 specimens of fossil mammals, and shell and skull of a fossil turtle, Nebraska; from Thomas K. Birks—a tiger salamander and a lamprey, Wiaconsin; from the Charleston Museum—6 chain pike and 16 grass pike, South Carolina; from Edward Brundage, Jr.—45 salamanders, a frog, and a snake, North Carolina; from United States Department of Agriculture—3 hundles of bamboo culms and a hox of leaves, Georgia; from Dr. Alfred E. Emerson—a western wood frog, Wyoming; from Klauss Abegg—2 toads, a anake, 2 white-footed mice, and 2 red aquirrels, Michigan; from Mr. and Mrs. William Haskell Simpson—a ailk embroidery and a painting in colors on silk, China, and 2 painted pottery jars, New Mexico; from Claud M. Longenecker—2 prehistoric atone axes and 50 projectile points, Indiana; from Homer E. Sargent—13 rugs, blankets, and a garment, Algeria and Tripoli, and an old serape, Mexico.

NEW MEMBERS

The following persons were elected to membership in Field Museum during the period from September 16 to October 15:

Contributors

Prince M. U. M. Salie

Non-Resident Life Members

Knox Hearne

Associate Members

John L. Cochran, Austin Guthrie Curtis, Jr., W. E. Denkewalter, Dewey A. Ericsson, Mrs. William Sherman Hay.

Annual Members

Edward A. Berger, Herman Black, John G. Curtis, William C. Flanagan, David F. Gladish, Mrs. Harry Hart, Mrs. Virginia W. Haskins, Miss Ray Hilliker, Scott A. Holman, Ralph H. Honecker, Mrs. Charles S. Kiessling, Dr. Joseph M. Leonard, Robert D. Mowry, Willis D. Nance, Dr. Harry A. Olin, Peter P. Person, Mrs. Arno P. Rayner, Reynold S. Smith, L. Parsons Warren.

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AZILIAN BOAR-HUNT SHOWN IN HALL OF STONE AGE

By Henry Field
Assistant Curator of Physical Anthropology

The sixth* group in the Hall of the Stone Age of the Old World (Hall C) is a dramatic scene in which dogs are assisting two Azilian men to hunt wild boar. The group represents the beginning of the domestication of animals, which was a great advance toward civilization.

The transition or mesolithic period which separated the old and new stone ages began in western Europe some 12,000 years ago. The climate was similar to that of the present day. The arctic flora was replaced by the birch and the pine, and the barren tundras and wind-swept steppes were superseded by forest. A modern fauna, characterized by the red deer, had taken the place of the mammoth and reindeer.

The last of the hunting races roamed Europe at that time. These people have been called Azilians after the type station located in the cavern of Mas d'Azil, about forty miles from Toulouse, France. The most remarkable of Azilian burials was found at Ofnet in southern Germany, where twenty-seven human skulls, buried in red ochre, were discovered in one grave. The skulls, with a few neck vertebrae, were orientated toward the setting sun. Evidently the heads were buried, after decapitation, with necklaces of perforated shells and deer's teeth. One of the vertebrae reveals the marks left by the flint knife which was used for severing the head from the body. Among the skulls there were examples of both round- and long-headed types, indicating that two races inhabited Europe in Azilian times.

The art of the Azilians was inferior to that of their predecessors, the Cro-Magnons, whose beautiful realistic work they replaced by conventional designs. No Azilian engravings or sculptures have been preserved. Painting was limited to simple designs in red ochre on flat pebbles from streams. Harpoons of a flat, broad type with one or two rows of barbs were developed for fishing. Poorly made flint and bone tools were also used. Cattle, horses and pigs, although still untamed, formed the chief food supply.

It was during the Azilian period that the dog was domesticated. The assistance of this companion in the hunt may well have compensated for the inferior quality of the hunting weapons, which consisted of long, wooden spears with flint blades attached.

In the Museum group a wild boar hunt is taking place at the entrance to Mas d'Azil. The scene shows two Azilian hunters armed with wooden spears with flint points, at close quarters with a wild boar defending its mate and two young ones. One of the hunters holds three dogs, who strain at the rawhide leashes. One young dog is lying dead on the bank—the result of coming into range of the sharp tusks of the male boar, which is at bay.

The background and roof of the cave, as well as the figures of the hunters, were modeled by Frederick Blaschke, who visited Mas d'Azil to make the necessary studies.

The painted section of the background is the work of Staff Artist Charles A. Corwin.

The group was planned and directed by the writer with the generous assistance of the Abbé Henri Breuil.

Early Hunters Using Dogs to Attack Wild Boar

Group in Hall of the Stone Age of the Old World showing men of the Azilian period, about 12,000 years ago. The exhibit illustrates the first use of domesticated animals.

*The first five groups, Chellean, Neanderthal, Aurignacian, Solutrean and Magdalenian, have been pictured and described in the July, August, September, October and November numbers of Field Museum News.

CHANGES IN VISITING HOURS

Attention is called to certain changes in the schedule of visiting hours to be observed at Field Museum in the future. Henceforth the hours during the various seasons will be as follows: November, December, January, February, March—9 a.m. to 4:30 p.m.; April, September, October—9 a.m. to 5 p.m.; May, June, July, August—9 a.m. to 6 p.m.

GIVE A MUSEUM MEMBERSHIP AS A CHRISTMAS GIFT

To those Members of Field Museum who are seeking for some friend, or friends, a Christmas gift that is especially distinctive, and who would at the same time appreciate an opportunity to simplify their Christmas shopping problems, the Museum extends its cooperation as in the past several years. A convenient plan for presenting Field Museum memberships as Christmas gifts is offered.

This plan reduces the task of selecting gifts to the easiest possible proportions, and eliminates the time and effort devoted to shopping and to preparing and sending packages. To give a Museum membership all you have to do is send to the Museum the name and address of the proposed Member, your own name and address, and the check for the membership fee. All other details will be taken care of for you. An attractive Christmas card will be sent by the Museum to any friends whom you may thus favor, notifying them that, through your generosity, they have become Members of this institution, and informing them as to what their membership privileges are. A wide choice is offered in the cost of gift memberships, beginning with the $10 annual membership. To assure delivery of notification cards to the recipients of your gifts by Christmas Day, it is advisable to send in applications before December 18.

When you present a Museum membership you indicate to the recipient a high estimate of his intellectual qualities—a belief that he is the type of person to whom association with a cultural institution would appeal. It is a gift that will not be forgotten—instead, it will remind the recipient of you many times a year, for he will receive monthly his copy of Field Museum News, and will be able to obtain reserved seats for the Museum lectures.

Among other privileges in which he will participate as a Member may be mentioned free admission to the Museum for himself, his family and house guests at all times; the right to have out-of-town friends admitted free of charge on presentation of the Member's personal card; the opportunity to obtain certain Museum publications on request; and, when traveling, the extension of the courtesies of every museum of note in the United States and Canada.

Field Museum of Natural History

Founded by Marshall Field, 1893

Roosevelt Road and Lake Michigan, Chicago

Field Museum is open every day of the year during the hours indicated below:

Nov., Dec., Jan., Feb., Mar.	9 A.M. to 4:30 P.M.
April, September, October	9 A.M. to 5:00 P.M.
May, June, July, August	9 A.M. to 6:00 P.M.

Admission is free to Members on all days. Other adults are admitted free on Thursdays, Saturdaya and Sundays; non-members pay 25 cents on other days. Children are admitted free on all days. Students and faculty members of educational institutions are admitted free any day upon presentation of credentials.

The Museum's natural history Library is open for reference daily except Saturday afternoon and Sunday.

Traveling exhibits are circulated in the schools of Chicago by the N. W. Harris Public School Extension Department of the Museum.

Lectures for schools, and special entertainments and tours for children at the Museum, are provided by the James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures.

Announcements of free illustrated lectures for the public, and special lectures for Members of the Museum, will appear in FIELD MUSEUM NEWS.

A cafeteria in the Museum serves visitors. Rooms are provided for those bringing their lunches.

Chicago Motor Coach Company No. 26 buses go direct to the Museum.

Members are requested to inform the Museum promptly of changes of address.

MEMBERSHIP IN FIELD MUSEUM

Field Museum has several classes of Members. Benefactors give or devise $100,000 or more. Contributors give or devise $1,000 to $100,000. Life Members give $500; Non-Resident Life and Associate Members pay $100; Non-Resident Associate Members pay $50. All the above classes are exempt from dues. Sustaining Members contribute $25 annually. After six years they become Associate Members. Annual Members contribute $10 annually. Other memberships are Corporate, Honorary, Patron, and Corresponding, additions under these classifications being made by special action of the Board of Trustees.

Each Member, in all classes, is entitled to free admission to the Museum for himself, his family and house guests, and to two reserved seats for Museum lectures provided for Members. Subscription to FIELD MUSEUM NEWS is included with all memberships. The courtesies of every museum of note in the United States and Canada are extended to all Members of Field Museum. A Member may give his personal card to non-residents of Chicago, upon presentation of which they will be admitted to the Museum without charge. Further information about memberships will be sent on request.

BEQUESTS AND ENDOWMENTS

Bequests to Field Museum of Natural History may be made in securities, money, books or collections. They may, if desired, take the form of a memorial to a person or cause, named by the giver.

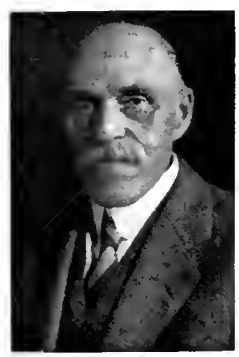
Cash contributions made within the taxable year not exceeding 15 per cent of the taxpayer's net income are allowable as deductions in computing net income under Article 251 of Regulation 69 relating to the income tax under the Revenue Act of 1926.

Endowments may be made to the Museum with the provision that an annuity be paid to the patron for life. These annuities are tax-free and are guaranteed against fluctuation in amount.

DEATH TAKES DR. FARRINGTON, CURATOR OF GEOLOGY

Dr. Oliver Cummings Farrington, Curator of the Department of Geology at Field Museum for the past thirty-nine years, and internationally recognized as a leading authority on gems, gem minerals, and meteorites, died November 2. He was 69 years old, and had been seriously ill for several months.

Dr. Farrington received his bachelor's and master's degrees in science at the University of Maine, and his doctorate at Yale. Previous to his curatorship here, he was a teacher of science in various eastern academies, and was connected for a time with Yale University, and with the United States National Museum. From 1894 to 1904, in addition to his duties at the Museum, he served as a lecturer on mineralogy at the University of Chicago. He was the author of a number of books, and a frequent contributor to scientific journals. Honors had been bestowed upon him by the Geological Society of America, the American Association for the Advancement of Science, the American Association of Museums, the Society for Research on Meteorites, Sigma Xi, and Phi Beta Kappa. He did important special work for the Paris Exposition of 1900 and the St. Louis Exposition in 1904.



Oliver C. Farrington

After funeral services in Chicago, Dr. Farrington was buried at Brewer, Maine, where he was born in 1864. He is survived by his widow, the former Clara A. Bradley of New Haven, Connecticut.

At its meeting on November 20, the Board of Trustees of the Museum adopted the following resolution in honor of Dr. Farrington:

"In the death on November 2, 1933, of Dr. Oliver Cummings Farrington, Curator of Geology at Field Museum of Natural History since 1894, the Board of Trustees is sorrowfully aware of the loss of one of the oldest, and one of the ablest, members of the Museum Staff. Dr. Farrington had been associated with this institution, as head of its Department of Geology, from the very beginnings of its active functioning as a scientific organization.

"In scientific circles Dr. Farrington was regarded with extreme respect and admiration not only for the very successful work he did in building up Field Museum's geological collections and activities, but also as a great scholar, and one of the world's foremost authorities on gems and gem minerals, and on meteorites.

"The tremendous breadth of his knowledge of all divisions of the science of geology, and his outstanding skill in museum work, have their permanent monument in the exhibits occupying the various halls of his Department, which bear throughout the evidences of his mastery of the subjects they illustrate. Learned to the highest degree, he was supremely possessed of that faculty which makes the ideal museum man—the ability to translate his erudition into forms easily intelligible to the least-read layman. He was, thus, a great educator, spreading knowledge to the millions of people visiting the exhibits for which he was responsible.

"Dr. Farrington frequently went out into the field to collect material for the Museum, his most important undertaking of this kind having been as leader of the Marshall Field Geological Expedition to Brazil in 1922–23. He was the author of important scientific publications issued by Field Museum and other publishers. He had achieved note as a teacher of science in academies and universities, and was an officer and fellow of prominent scientific societies. Great expositions sought and received his advice and assistance in their scientific divisions. Some years ago the Trustees of Field Museum elected him a Life Member of this institution.

"In his passing the Trustees recognize the loss of a man of broad intellect and high character, whose devotion to science resulted in a career of splendid achievements.

"Therefore, be it resolved, that this expression of the Trustees' appreciation of Dr. Farrington's many years of loyal and valuable service to the Museum and to science, be permanently preserved on the records of the Board;

"And be it further resolved that our deep sympathy be conveyed to his bereaved family, and that a copy of this resolution be transmitted to his widow."

A memorial resolution was adopted also by the Director, scientific staff, and entire personnel of the Museum.

RAYMOND FOUNDATION PRESENTS FINAL AUTUMN PROGRAM

The last of the autumn series of entertainments for children, provided by the James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures, will be given Saturday morning, December 2, in the James Simpson Theatre of the Museum. The motion pictures, "Through the Year with Animal Friends: Spring, Summer, Autumn, and Winter," will be presented. There will be two showings, one beginning at 10 A.M. and one at 11. Children from all parts of Chicago and suburbs are invited. Admission is free.

Four New Contributors Elected

In recognition of recent valuable gifts to the Museum, four friends of the institution have been elected to the class of Museum membership designated as Contributors, which embraces those whose contributions in money or materials range between $1,000 and $100,000.

Leon Mandel and Fred L. Mandel, Jr., of Chicago, were elected Contributors for their generous contributions of funds which made possible the Mandel-Field Museum Zoological Expedition to Venezuela in 1932.

Master Stanley Field Blaschke of Cold Spring-on-Hudson, New York, has been elected a Contributor in recognition of a gift of $1,000 in cash made in his name by his father, Frederick Blaschke, the sculptor who prepared the groups in the Hall of the Stone Age of the Old World, and several groups in Ernest R. Graham Hall of Historical Geology.

Miss Malvina Hoffman of New York and Paris, who made the sculptures representing the races of mankind exhibited in Chauncey Keep Memorial Hall, was elected a Contributor in recognition of the gift of a limestone bust of a Chinese boy.

MANDEL ZOOLOGICAL EXPEDITION SAILS FOR GUATEMALA

A zoological expedition, sponsored by Leon Mandel of Chicago, to make extensive collections of birds, mammals, reptiles and amphibians of Guatemala for Field Museum, sailed from New Orleans November 21, aboard the steamship *Tivives*, for Puerto Barrios. The official name of the expedition is the Leon Mandel Guatemala Expedition of Field Museum.

A few weeks hence, after the party of scientists has completed preliminary reconnoitering and established camps, Mr. Mandel is expected to join the expedition for a short vacation. This is the second expedition in which Mr. Mandel has participated as a collector. His deep interest in zoology, and enthusiasm as a collector of museum specimens, was previously shown in 1932 when he organized and led the Mandel-Field Museum Zoological Expedition to Venezuela which sailed aboard his yacht *Buccaneer*, making a long sea voyage and penetrating the innermost navigable reaches of the Orinoco River.

Karl P. Schmidt, Assistant Curator of Reptiles at the Museum, is leader of the present expedition. He is accompanied by F. J. W. Schmidt, biologist, Emmet R. Blake, ornithologist, and Daniel Clark, general assistant. The expedition will remain in Guatemala for about six months, surveying various regions of the country, which is remarkable for its diversification of climate and altitude. This diversity of habitat, which results in a wealth of species of animal life, reaches its maximum for Central America in Guatemala. The country is of special interest zoologically also because it is the meeting ground of North and South American types of life.

Field Museum has for years carried on investigations of the fauna of the American tropics, and the present expedition is for the purpose of furthering these important studies. While the expedition's primary aim will be to collect specimens for addition to the Museum's vast scientific reference collections, it will also seek material for the exhibits, including strikingly interesting species of tropical reptiles, and a wide variety of Central American birds to be used in a series of groups reproducing the natural habitats of the birds. One of the groups for which specimens will be sought is that of the giant oriole with its peculiar long bag-like nests which hang in crowded colonies on the trees. Various notable game birds, and macaws, toucans, and other exotic species, will also be hunted.

Leader Karl Schmidt will concentrate his efforts on his specialty, the reptiles, while his brother, F. J. W. Schmidt, will specialize on mammals, and Mr. Blake will have charge of bird collecting. Karl Schmidt's share in this expedition will be a continuation of his work on the Central American fauna for which he was awarded a fellowship in 1932 by the John Simon Guggenheim Memorial Foundation. As far back as 1923 Mr. Schmidt made extensive collections in the adjacent countries of Honduras and British Honduras. Among the most interesting creatures to be collected on the present Guatemalan trip are arboreal salamanders and frogs, many of which have extraordinary breeding habits.

Mr. Blake was one of the principal collectors on the Mandel-Field Museum Zoological Expedition to Venezuela in 1932, on which he made a remarkable record by collecting and preparing more than 800 birdskins within a period of only five weeks in the mountain rain forests of the Mount Turumiquiri region.

F. J. W. Schmidt has for several years experimented with special methods of collecting mammals, and will apply his experience on the exceptionally rich mammalian fauna of Guatemala in the hope of collecting new and little-known forms.

Additions to Library

The Museum Library, which had several volumes of the Memoirs of the Egyptian Exploration Fund, recently received three more volumes. Also the latest volume of the Palaeontographical Society, volume 1 of Mizraim, and another volume of Obras Completas de Ameghino, have been received.

EXHIBIT SHOWS FOSSIL SKELETON AS FOUND IN THE EARTH

By Elmer S. Riggs
Associate Curator of Paleontology

A new exhibit in Ernest R. Graham Hall (Hall 38) shows a fossil skeleton in the earth just as it was discovered by the Marshall Field Paleontological Expedition to Argentina and Bolivia. The animal is one of the great sloths abundant in South America ten thousand years ago. The exhibit shows how such fossils are preserved through long periods, and how they are sometimes revealed when erosion by rain and stream attacks their burial places.

These sloths, great beasts which originated many millions of years ago, played an important part in the animal history of South America. They had long narrow heads, clumsy bodies, short stout hind legs, long forelegs, and massive tails. They are distantly related to the little tree sloths which still live along the Amazon. They lumbered about the low, wet pampas lands overgrown with reedy grasses and tall, plumed pampas grass. With the great claws of their forefeet they tore up the ground in search of roots and tubers upon which they fed. In autumn they wandered northward to sparsely wooded lands. Rearing upon their hind legs, they pulled down the branches of the abundant algaroba trees and, with long slender tongue, gathered in and fed upon the sweet seed pods.

Laymen often ask, "How do you know where to dig to find fossil skeletons?" This skeleton, half revealed in the earth, answers that question. The scene represents a stretch of pampas land, as level and as fertile as the plains of Illinois. In winter rains are frequent on the pampas. Shallow streams often overflow their banks. The flood waters are heavy with mud and fine sand. Flowing out upon the reedy meadows the current of the stream is checked and the sediment settles in layers over the ground. In the dry weather of late summer, sands are scattered by winds over the adjacent grasslands. Year after year this work of wind and stream is repeated and layer after layer is built up, covering plants and bodies of animals.

The skeletons of the great sloths were left among the reeds or by the shores of streams. The sediments, gathering through thousands of years, covered and preserved many of them. Ages later, when these lands had been raised higher than the shore to southward, streams cut their channels through the older sediments underlying the plain. When men came to graze their cattle and horses over these lands and to grow wheat and other grains, they found, from time to time, the bones of strange animals washed out on the banks of streams. Reports of these became subjects of scientific study in many countries.

Fossil Sloth Skeleton as Paleontologists Found It

New exhibit in Ernest R. Graham Hall shows how the remains of an extinct animal were preserved in the pampas formation of Argentina and there discovered by members of a Museum expedition.

Such reports led the Marshall Field Paleontological Expedition to the region where this skeleton was discovered. One of the members followed up a dry wash near the River Quequen Grande. The banks of this wash, cut through wheat and pasture lands, were steep and bare of vegetation. Winter rains and summer winds were steadily wearing them away. Thus it happened that the skeleton of this great sloth, buried some ten thousand years ago, was being laid bare. On the face of the bank, four or five feet below the soil, an irregular line of dark brown spots caught the attention of the collector. Hasty examination showed that these were the broken ends of fossil bones.

At the left the point of the nose was just appearing. To the right, were the bones of the foreleg. Farther to the right, the point of the hip appeared and beyond that the extended hind leg. With pick and shovel workmen removed the soil and underlying sandy clay until the skeleton was revealed as now shown in the Museum group, the preparation of which is the work of Phil C. Orr of the staff of the Department of Geology.

3,200,000 ATTENDANCE BREAKS RECORDS OF ALL MUSEUMS

More than three million two hundred thousand persons visited Field Museum during 1933 from January 1 to November 12 (closing date of A Century of Progress), making an attendance record which exceeds any ever attained by any museum in the United States, and probably exceeding the highest figure ever reached by such an institution in the world. The best available comparative statistics indicate that the previous highest attendance for any similar institution was something over two million during an entire year, and not more than two American museums have reached that mark.

The exact number of visitors received at Field Museum during the period above indicated was 3,208,414. This represents an increase of 76 per cent over the attendance for the entire twelve months of 1932, which was 1,824,202, and with 49 more days of 1933 still to be added, the record will be even greater by the end of the year.

While, naturally, much of the increase resulted from the fact that the grounds of A Century of Progress were adjacent to the Museum, there was, nevertheless, a large normal increase which must be attributed to the continuance of the steady upward trend which has been noted year after year rather than to the influence of the exposition. This is shown by the fact that from January 1 to May 26, 1933, inclusive (the period prior to the opening of the exposition) attendance at the Museum totaled 707,245, as compared with the total of 549,407 visitors received at the Museum between the same dates in 1932. Thus even during the pre-exposition period of 1933 the increase over 1932 was 157,838 or more than 28 per cent. The attendance during the exposition (May 27 to November 12 inclusive) was 2,501,169.

Of the 3,208,414 persons visiting the Museum up to November 12 this year, 209,624 or only about 6½ per cent paid the 25-cent admission fee charged on Mondays, Tuesdays, Wednesdays and Fridays; all the rest, numbering 2,998,790 or 93½ per cent, either came on Thursdays, Saturdays and Sundays when admission is free, or belonged to classifications such as children, teachers, students, and Museum Members and their guests, who are admitted free on all days.

These figures demonstrate the extent to which the Museum has subordinated possibilities of increased revenue to the greater objective of providing service to the public on the widest possible scale. They show that the Museum is fulfilling its mission as a great educational institution, and that Chicagoans and visitors to the city appreciate and take full advantage of the institution's tremendous resources for the dissemination of scientific knowledge.

Some high attendance records for individual days have also been made during 1933. There were two days upon each of which attendance exceeded sixty-five thousand persons, and seven days upon which attendance exceeded fifty thousand persons.

Acting Curator Appointed

Henry W. Nichols has been appointed Acting Curator of the Department of Geology. Mr. Nichols' long association with the late Dr. Oliver C. Farrington, Curator, and his thorough acquaintance with Dr. Farrington's methods, assure that the work of the Department will continue uninterruptedly along the same lines upon which it has been so successfully conducted in the past.

Mr. Nichols joined the Museum staff in 1894, and during the early years of the institution served as Curator of Economic Geology. Later, when the various divisions were consolidated into a single Department of Geology, Mr. Nichols remained as Assistant Curator, and with the expansion of the Department in more recent years was made Associate Curator. He has participated in a number of the Museum's expeditions, in some cases as leader. In his most important field work he covered the greater part of South America, collecting geological material. He has specialized in mineralogy and the economic aspects of geology, but has a thorough background in all divisions of this science. Previous to 1894 he taught geology at Massachusetts Institute of Technology.

GREEK, ROMAN BRONZE REPLICAS OFFERED FOR SALE

In the process of reorganizing Edward E. and Emma B. Ayer Hall, devoted to Mediterranean archaeology, it was found that for lack of space a large portion of reproductions of Greek and Roman bronzes could not be used for exhibition. The Museum therefore desires to dispose of this surplus material which may be of interest especially to art departments of universities and colleges for purposes of instruction. These reproductions in copper or bronze, very exactly made as to shape, design, and patina, were executed in 1895 by the firm Sabatino de Angelis and Son, after originals in the National Museum of Naples, and convey a very exact idea of the originals.

The collection consists of more than 250 objects large and small, including a chest, couches, tables and stands, stools and chairs, lamps, candelabra, lamp-rests, lanterns, braziers, water-heaters, stoves, amphoras, pitchers, balances and steelyards. A complete description of this collection, accompanied by 82 plates, was prepared by F. B. Tarbell, professor of classical archaeology at the University of Chicago, and was published by Field Museum in 1909 (Publication 130). A copy of this Catalogue of Bronzes will be placed at the disposal of institutions which may be interested in the purchase of the reproductions, upon request to the Director of Field Museum.

A Gift from Homer E. Sargent

A fine old Mexican serape and thirteen rare textiles from Algeria were recently presented to the Museum by Homer E. Sargent, an old and loyal friend of the institution, which is indebted to him for many other valuable gifts.

This material was placed on exhibition at once. The serape has been added to the Sargent–Ryerson collection of Mexican serapes in Case 19 of Hall 8. The north African fabrics are shown in a case placed in the center of Hall E, and make a very colorful exhibit. These come from the Kabyles, the natives of Algeria, and were collected by Mr. Sargent years ago during a journey through the country. It would be impossible to duplicate this collection at present. It comprises woolen rugs such as are used in mosques and family homes, draperies hung on the walls of mosques on festive occasions, and examples of the cape worn by Kabyle women. The workmanship is of the best, and this collection is the more appreciated as heretofore there were no specimens of north African weaving in the Museum.

DECEMBER GUIDE-LECTURE TOURS

Conducted tours of exhibits, under the guidance of staff lecturers, are made every afternoon at 3 P.M., except Saturdays, Sundays, and certain holidays. Following is the schedule of subjects and dates for December:

Friday, December 1—Eskimos.

Week beginning December 4: Monday—Fish and Reptiles; Tuesday—Primitive African Art; Wednesday—Egypt; Thursday—General Tour; Friday—Plant Life of South America.

Week beginning December 11: Monday—Chinese Exhibits; Tuesday—Prehistoric Life; Wednesday—Man Through the Ages; Thursday—General Tour; Friday—Hall of Races of Mankind.

Week beginning December 18: Monday—Jade and Gems; Tuesday—Mexico, Past and Present; Wednesday—Marine Life; Thursday—General Tour; Friday—Indian Art.

Week beginning December 25: Monday—Christmas holiday, *no tour;* Tuesday—African Animal Life; Wednesday—Peat, Coal and Oil; Thursday—General Tour; Friday—Men of the Stone Age.

Persons wishing to participate should apply at North Entrance. Tours are free and no gratuities are to be proffered. A new schedule will appear each month in FIELD MUSEUM NEWS. Guide-lecturers' services for special tours by parties of ten or more are available free of charge by arrangement with the Director a week in advance.

Gifts to the Museum

Following is a list of some of the principal gifts received during the last month:

From Miss Nejla Izzedin—a pottery lamp and 18 pieces of silver and other jewelry of Druze women, Syria; from Henry Field—22 pieces of Arabian household equipment, 25 painted pottery sherds, and a glass vessel, Irak and Transjordania, and 21 chert projectile points, Illinois and Indiana; from George H. Taber—incense box of reticulated porcelain, China; from Mrs. Wills B. Lane—embroidered costume of Quiche Indians, Guatemala; from William J. Chalmers—2 baskets of Hopi and Apache, Arizona; from School of Forestry, Yale University—115 herbarium specimens, Colombia and Ecuador; from Companhia Ford Industrial do Brasil—10 herbarium specimens and 8 wood specimens, Brazil; from William A. Schipp—68 herbarium specimens, British Honduras; from The Polish Institute for Collaboration with Foreign Countries—40 specimens of economic materials of botanical origin, and 62 specimens of ores and economic minerals, Poland; from The Northwest Mining Association—24 specimens of ores, Washington; from Houston Museum of Natural History—a specimen of pink calcite, Texas; from Julius Friesser—a specimen of stigmaria, West Virginia; from Leslie K. Quinn—partial skeleton of a fossil rodent, Nebraska; from Vergil Deardorff—lower jaw of a fossil mammal, Colorado; from W. G. Sprang—2 prairie chickens, Michigan; from Warren Buck—a monitor lizard, West Africa; from Norman E. Hickin—125 butterflies and 56 motha, England; from Lincoln Park Zoo—a Malayan tapir; from Emil Krauth—23 butterflies, South Dakota and Montana; from John Daily—105 marine fishes, near Biloxi, Mississippi.

NEW MEMBERS

The following persons were elected to membership in Field Museum during the period from October 16 to November 15:

Contributors

Master Stanley Field Blaschke, Miss Malvina Hoffman, Fred L. Mandel, Jr., Leon Mandel.

Associate Members

Dr. Clark W. Finnerud, Huntington B. Henry, Lloyd C. Partridge, Franklin Raber, Mrs. Charles H. Randle, Gerald A. Rolfes, E. W. Teagle.

Annual Members

Dr. John M. Berger, Mrs. John S. Burns, Mrs. Anna C. Deutsch, Gustav Egloff, R. W. Emerson, Mrs. Frank Ferry, Harry Hall, J. B. Hamblen, H. M. Henriksen, Mrs. Perry R. Johnson, Max M. Kann, John Payne Kellogg, David S. Malkov, Henry C. Murphy, Mrs. Fay E. Rickard, Mrs. Pina Rocca, George L. Stilwell, Edgar E. Wheeler, Mrs. Belle Ziff.

A specimen of the cacao or chocolate tree of Central and South America, showing the pods containing the seeds from which chocolate is obtained, is a feature of the Hall of Plant Life (Hall 29).

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