

Field Museum News

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No. 1

NEOLITHIC SUN-WORSHIP IS ILLUSTRATED IN THE HALL OF THE STONE AGE

BY HENRY FIELD

Assistant Curator of Physical Anthropology

The seventh* group in the new Hall of the Stone Age of the Old World (Hall C) shows the sun rising over the great alignment of stones at Carnac in Brittany, France.

The people of the new stone age, who probably came into Europe from those regions east of the Caspian Sea, brought with them the new culture upon which our modern civilization rests. Among their contributions were the practice of agriculture; the true domestication of animals, which involves breeding in captivity; the manufacture of pottery; and tool-making by grinding and polishing.

Agriculture and the domestication of animals played a large part in the early development of man. The finest hunting ground can support only a limited number of families, whereas, with sheep, cattle, and grain, a fertile and well-watered soil can be made to produce food and clothing for a large population. It is possible that paleolithic man may have tamed wild animals occasionally so that they worked for him, but true domestication of the sheep, goat, pig, and cattle did not take place until the neolithic period. It is interesting to note

*The first six groups—Chellean, Neanderthal, Aurignacian, Solutrean, Magdalenian and Azilian—have been pictured and described in FIELD MUSEUM NEWS, issues of July to December, 1933, inclusive.

that the horse was not domesticated until early historical times.

Fragments of pottery have been found in upper paleolithic deposits, but finished jars have been found from no period earlier than the neolithic.

Neolithic men lived in huts, which were often grouped together to form villages. The most primitive form of hut was the pit dwelling, either circular or oval in shape, but occasionally in the form of a roofed trench with a fireplace. In late neolithic

headed, although skulls of round and intermediate form have been excavated.

In northern and western Europe tombs of many types were constructed with large, roughly dressed stones, many of which weigh several tons. The method employed to drag these stones to the desired place and raise them to an upright position is unknown. In addition to special tombs, there are single standing stones, known as menhirs, marking burials. Menhirs placed in parallel lines are known as alignments.

The most important of these is the Carnac alignment, a general view of which is presented in the Museum group.

This great line of menhirs, running east and west, was a place of worship of the sun, possibly combined in some way with the cult of the dead. A priest is shown with his arms raised toward the rising sun, which casts long, dark shadows behind the great blocks of weathered granite. He is welcoming the birth of a new day.

The figure of the neolithic priest is by Frederick Blaschke. The painted background is the work of Staff Artist Charles A. Corwin, who had for reference a scale model, sketches, and paintings made at Carnac by Pierre Gâtier, and still and

motion pictures taken by Henri Barrère. The group was planned and directed by the writer with the collaboration of the Abbé Henri Breuil and Zacharie le Rouzic.



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A Neolithic Priest Welcomes a New Day

The mysterious prehistoric avenue of menhirs at Carnac, Brittany, is shown in this group in the Hall of the Stone Age of the Old World. The time represented is about 10,000 years ago.

times houses were built which were more like modern types, with several compartments and occasionally with two stories.

The neolithic population was mainly long-

MUSEUM RADIO TALKS ON WGN

Through the courtesy of WGN, the Chicago Tribune radio station, a series of talks on Field Museum and its activities is being broadcast by members of the Museum staff. The series opened on December 15 with a lecture by Director Stephen C. Simms on the Museum as a whole. Dr. Berthold Laufer, Curator of Anthropology, outlined the work of his department on December 29. Others scheduled to speak are Associate Curator Paul C. Standley, who will tell of the work of the Department of Botany on January 12; Acting Curator Henry W. Nichols, who will talk on the Department of Geology on January 26; Dr. Wilfred H. Osgood, Curator of Zoology, who will speak about his department on February 9; and Miss Margaret M. Cornell, Chief Guide-lecturer, who will sketch the activities of

the James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures, on February 23. These talks are scheduled to begin at 4 P.M. An additional talk, to be announced later, will be given in March.

PHANTOM CRYSTALS

Two quartz crystals with phantoms, presented to the Museum by Fritz Ackerman of Bahia, Brazil, have been added to the mineral collection in Hall 34. Phantoms are diaphanous crystal shapes which appear in the interior of transparent crystals. Some are quite distinct, others are faint, misty forms which well merit the name of phantom. Many are the result of microscopic gas or air bubbles arranged in crystal form. In others, minute rods and spangles of other

minerals replace the bubbles. Sometimes when a crystal is growing the surface becomes soiled and the soiled surface is later covered as the crystal continues to grow. A growth which began as a colored crystal may change during its growth to another color or to a colorless form.

Phantom crystals are seldom mentioned by name in the text books, yet they have always been favorites of mineral collectors.

—H.W.N.

Uses Same Nest Year after Year

Unlike most birds, the golden eagle uses the same nest year after year, merely enlarging it periodically to meet its needs. A striking group of these birds, mounted amid a setting reproducing their natural environment, is on exhibition in Hall 20.

Field Museum of Natural History

Founded by Marshall Field, 1893

Roosevelt Road and Lake Michigan, Chicago

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FIELD MUSEUM NEWS

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

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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, 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.

A MESSAGE FROM THE DIRECTOR

For the loyal support they have given during the difficult years of depression, Field Museum thanks its thousands of Members. The Museum has been fortunate in the number of Members who have continued on its rolls in spite of adverse economic conditions. While there has again been some decline during 1933 in the total number of Members, the rate of decrease has been markedly less than in the two preceding years.

In expressing appreciation to those who have retained their memberships it may be considered pardonable, perhaps, to urge that they continue further this support in the new year now beginning, and in succeeding years. The Museum is still confronted with severe financial problems in carrying on its mission in educational and scientific fields of endeavor, and the contributions received in the form of membership fees are an important part of the institution's revenues. The help of every present Member is needed, and many new Members must be sought. An appeal is made to all present Members not only to continue their own direct assistance, but to propose the names of other persons of their acquaintance who might be interested in becoming Members.

—STEPHEN C. SIMMS, *Director*

THE ETRUSCANS

BY BERTHOLD LAUFER

Curator, Department of Anthropology

The origin of the Etruscans has long been a mystery that has aroused many lively controversies. It is now certain that the Etruscans were not natives of Italy; they were Orientals or semi-Orientals who came from some part of Asia Minor, sailing across the Mediterranean and landing in northern Italy about 800 B.C. The new immigrants soon developed into a powerful nation which possessed a strong navy and carried on a considerable maritime commerce.

The Oriental origin of the Etruscans is revealed by many features of their religious beliefs and worship, but above all by their earliest art, which shows close contact with Mesopotamia, Syria, and Cyprus on the one side and with Egypt on the other. Sphinxes, human heads, and lotus designs of true Egyptian style are found on early Etruscan pottery and sarcophagi. From the seventh century onward Greek influence began to be felt in Etruria. More than any other Italic people the Etruscans appreciated the beauty of Greek art and made it their own by importation and imitation.

Field Museum has a remarkable Etruscan collection, part of which is the result of excavations carried on in 1895-96 at the ancient cemetery of Narce about ninety miles north of Rome, in Etruria, under the direction of A. L. Frothingham. This was one of the Museum's earliest expeditions, and was sponsored by the late Charles L. Hutchinson. The period over which the tombs of this locality extend is the first half of the seventh century B.C. The tombs were laid out in the form of trenches and characterized by the change from incineration to inhumation. Numerous objects found in the tombs reveal an advanced stage of culture and include many fine examples of bucchero ware, pottery painted red and polished, pottery decorated with designs in red on yellowish ground, and quantities of bronze ornaments which were concealed in jars. Bucchero is the designation of a black pottery for which the Etruscans were famous. The deep lustrous

black surface was produced by fumigation in a closed furnace, or by covering before baking with a coating of charcoal, whereupon the vase or dish was carefully polished.

The Etruscans had a peculiar kind of stove. A pottery jar in which the food was cooked was placed on a slender, hollow pottery support usually cut out in open-work. These so-called vase carriers were placed over a fire which carried the heat upward into the jar on top.

A curious feature of many bronze bracelets is that fibulas are attached to them. A fibula is a clasp, usually ornamented, and it was indispensable to the ancients for fastening their garments; it is the precursor of our safety pin. As we carry spare tires on our cars to be used in case of emergency, so the Etruscans carried spare fibulas on their bracelets to have them handy in case one was lost, which could easily happen.

Cremation of the dead was much practiced in some parts of Etruria and resulted in the making of urns for the ashes of the deceased. These urns are made of pottery, tufa, or alabaster. In shape they are miniature sarcophagi, the cover being decorated with a recumbent figure intended to represent the deceased person, while the front of the chest is carved with a scene in high relief and painted in colors. Most of the subjects have some allusion to death, either directly when a dying man is represented, or indirectly in mythological scenes of fatal combats.

A burial urn of marble shows a fine relief, with considerable remains of color, representing Achilles, the hero of Homer's Iliad, holding the head of a Trojan youth. A very fine alabaster burial urn from Chiusi shows the effigy of the deceased on the cover. The front of the chest is carved with a vivid battle scene in high relief: an armored horseman attacking a Gaul with a lance, while the latter, kneeling on the ground, plunges his sword into the horse's belly.

The treasures of the Museum include three large painted sarcophagi, made from a volcanic tufa, which are unique. They have been described in detail by the late Professor F. B. Tarbell in Field Museum Publication No. 195. Prominent among the designs painted in colors are marine monsters or sea dragons, creations of Etruscan mythology elicited by the people's fondness of the sea and maritime enterprise.

The Etruscan collections have recently been reinstalled in Edward E. and Emma B. Ayer Hall (Hall 2), in a more systematic arrangement, and are now interpreted by more informative labels.

Oysters a Foot in Diameter

Had there been men on earth to eat them, one oyster of the Oligocene or Miocene period, nineteen to thirty-nine million years ago, would have been sufficient to provide a feast for an entire family and their guests, as against a half-dozen to a dozen modern oysters on the half-shell for each individual.

Fossil shells of some of these giant prehistoric mollusks are on exhibition in Ernest R. Graham Hall (Hall 38). They range from six to twelve inches in diameter, and the shells alone weigh as much as sixteen pounds. They were obtained in southern Argentina, from ledges of ancient sandstone and gravel in which they had been buried so many millions of years. The prehistoric oyster beds from which they came occur over several hundred miles along the coast. Many of the shells are also found far inland, and are thus among the indications that, eons ago, a sea covered the continent.

ARMADILLOS, ANTEATERS, AND THEIR RELATIVES EXHIBITED

By COLIN CAMPBELL SANBORN
Assistant Curator of Mammals

The edentate order of mammals is represented in the Americas by the armadillos, sloths, and anteaters; in Africa by the aardvark; and in Africa and Asia by the pangolins or scaly anteaters. An exhibit including specimens of all these has just been installed among the systematic collections of mammals in Hall 15.

While the armadillos, sloths, and aardvark are not edentates in the sense of being toothless, their teeth, of a very primitive character, are limited to premolars and molars. The others have no teeth. Although strikingly different externally, all these animals have certain morphological characters by which they are related.

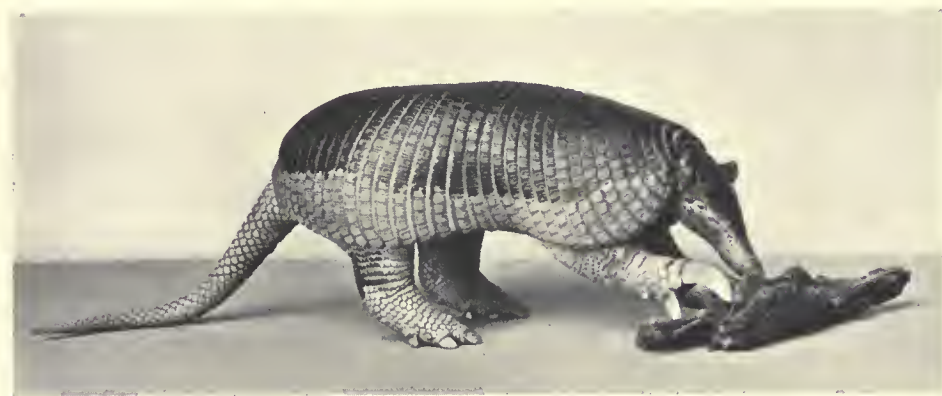
The armadillos, which range from Texas to Patagonia, include seven genera and a number of species. They are covered with a flexible bony shell or carapace which is divided into three parts, an anterior and a posterior shield separated by a variable number of movable bands. While this shell

The anteaters, of which there are three, vary greatly in size and appearance. They are toothless, have very small mouths, and long sticky tongues with which they capture the ants and termites on which they feed. The giant anteater is terrestrial but has been known to climb trees. The tamandua is partially arboreal and the silky anteater is wholly so; both have prehensile tails.

Various forms of the two-toed and three-toed sloths are found in Central America and in the northern part of South America. These harmless creatures are so highly adapted for living in trees that they are almost helpless when on the ground. They live entirely on leaves and fruit.

The aardvark or earth pig is, in its habits and mode of living, very much like the armadillos, except that it feeds exclusively on ants and termites, like the anteaters.

The pangolins or scaly anteaters are found in Africa and southeastern Asia. Some forms are arboreal and have prehensile tails. All live in burrows in the ground and the entrances to these are plugged with dirt in



Giant Armadillo

Specimen of the largest extant variety of armadillo known, which has been placed on exhibition in Hall 15. The animal comes from Bolivia and is more than four feet long.

is a partial protection, most of the armadillos rely on their power to dig rapidly into the earth to escape from their carnivorous enemies. The armadillos range in size from the pygmy, which is about eight inches long and weighs less than a pound, to the giant which is more than four feet long and so heavy that a man can hardly lift one. Armadillos eat bugs, grubs, and ants; some of the larger ones feed on carrion at times.

The three-banded armadillo is different in many ways from the others. It has the hardest carapace, the shields being rigid, and it is the only one that rolls into a ball for protection. It is the only one that walks on the tips of the nails on the front feet.

"THREE-DIMENSIONAL PICTURES" OF MUSEUM ANIMAL GROUPS

Most unusual pictures of thirty-one of the more important habitat groups of North American, Asiatic, and African mammals at Field Museum are contained in a book recently published, entitled *The Animal Kingdom*. The pictures are printed by a special process which makes them appear, when viewed through the "Orthoscope" (an optical device which accompanies each copy of the book) to be in three dimensions, like the groups which they depict. The animals stand out from the background, producing an illusion of reality which is fascinating to children and adults alike. Each picture is accompanied by an informa-

tive text about the animals shown. The book is 9 by 11 inches in size, and is bound in dupont leather. It is published by the Orthovis Company of Chicago. Copies are on sale at the Museum for \$2.00 each, plus 15 cents for postage if ordered by mail.

Many of the specimens shown in the Museum exhibit were collected by the Marshall Field Brazilian Expedition. The aardvark was taken on the Harold White-John Coats African Expedition, and the Temminck's pangolin is a gift of the late Robert E. Everard. The specimens were prepared for exhibition by Staff Taxidermist Arthur G. Rueckert, assisted by Frank C. Wonder.

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Field Museum Album Price Reduced

The remaining stock of the *Field Museum Album*, a booklet containing ten cabinet views of the Museum and its exhibits, together with ten photogravure post cards, complete with mailing envelope, is now available at 25 cents per copy, plus 5 cents for postage if ordered by mail. Formerly sold at 75 cents, this album provides an unusually attractive souvenir or gift.

DESERT VARNISH

By HENRY W. NICHOLS
Acting Curator, Department of Geology

Pebbles and outcrops of rocks on the surface of a desert, are often covered with desert varnish. This is a thin, lustrous, brown coating which looks like a brown lacquer rubbed to a dull finish. The best examples among those shown in Clarence Buckingham Hall (Hall 35) were collected in semi-arid parts of Brazil and in the Atacama Desert of Chile, by the Marshall Field Brazilian Expedition. The surfaces of these pebbles had been ground and polished by sands blown by desert winds before the varnish was formed. This and a continued polishing action by blowing sands during the growth of the varnish contributes to the perfection of the lacquered surface which sometimes looks decidedly artificial. The varnish, which is a mixture of the oxides of iron and manganese, owes its color to the manganese.

The presence of this varnish is due to a desert phenomenon unknown to many. Small quantities of moisture escape from all desert surfaces, no matter how dry. The dry air absorbs this moisture so avidly that no appreciable dampness remains in the soil, and under the more extreme desert conditions even cacti cannot find sufficient moisture to survive. This moisture comes from the ground waters which underlie deserts as they do all parts of the earth's surface. This water rises slowly by capillary attraction over sand and pebbles and through their pores until a little of it reaches the surface where it promptly evaporates. These are mineral waters which carry much dissolved mineral matter, but the vapor from their evaporation is the vapor of pure water, so all mineral matter must be left behind at the point of evaporation, and it is this deposit by these waters of mineral residue that forms the coating of desert varnish. Why this coat is composed principally of metallic oxides and what becomes of the rest of the dissolved mineral matter is too long a story to tell here even if it could all be told before the problem has much more study. In Brazil, where some of the varnished pebbles were found, large beds of aluminum, iron and manganese ores have been deposited by the same process. In Chile, where other varnished pebbles were collected, surface beds of rock salt, gypsum and soda niter have been formed by this action. Most of the desert varnish in the collections is colored by manganese, but in places where manganese minerals are not abundant there are desert varnishes composed chiefly of oxides of iron.

Most ancient rock surfaces are more or less discolored by the effects of the weather. A variety of such discolorations appears on specimens in Hall 35 illustrating rock weathering and erosion. Even around Chicago, where the limestone surface was thoroughly scrubbed by the glacier only a few thousand years ago, it is possible to find places where the stone has a dark coating not due to dirt. Such coats are usually thin and not to be compared to the desert varnish. Discolored stone faces of buildings in large cities are the effect of grime from the outside and are not related to the varnish.

S. K. Roy Reassigned

With a reassignment of duties, the title of Sharat K. Roy, until recently Assistant Curator of Invertebrate Paleontology, has been changed to Assistant Curator of Geology.

A NEW WAY TO DINE

A unique form of entertainment, especially suitable for business men's luncheon clubs, women's clubs, educational and scientific societies, and social organizations of all kinds—also for individuals desiring to entertain guests in a way that is new and different—is now made possible through the facilities of Field Museum's cafeteria and lunch-rooms. The cafeteria management is prepared to give special attention to parties desiring to arrange for luncheons, afternoon teas, mid-morning breakfasts, or other refreshments in connection with visits to the Museum. By making arrangements in advance with the manager of the cafeteria such parties can have either service by waitresses, or self-service.

Many such parties have already been served, and have found it a delightful way of concluding a tour of the Museum exhibits. Pleasant restful surroundings, the best of foods and beverages, and reasonable prices, are offered. The main cafeteria is decorated to symbolize the far reaches from which the Museum's collections have been gathered, the walls being painted with large maps, in pastel colors, of each of the continents, of the Arctic and Antarctic regions, and of the world as a whole. Colorful tables and chairs, and attractively designed chinaware and other table service of types unusual in a restaurant, enhance the pleasant atmosphere.

A children's room is also available with especially low prices for luncheons served to parties of children.

The cafeteria is open every day, including Sundays, from 10 A.M. to 3:30 P.M. for the service of the general public. Arrangements for special parties may be made by personal call, letter, or telephone call (Wabash 9410) to Mrs. Mae Ellena Bachler, the manager. Menus and prices can be arranged in accordance with individual wishes.

CORK EXHIBIT

By LLEWELYN WILLIAMS
Assistant in Wood Technology

Cork is the soft, spongy and somewhat elastic outer layer of bark of a species of oak (*Quercus suber*), cultivated principally in Spain, Portugal and northern Africa. As the tree grows older, and especially after peeling, the bark thickens, becoming firmer and denser. It naturally falls from the trees at certain periods in their growth, but for commercial purposes it is artificially removed, care being taken to avoid wounding the inner bark.

To put a forest of cork oak into condition for exploitation the first step is to remove the layer of old or male cork which forms under natural conditions. This operation, requiring considerable skill, is performed in the spring when the sap is beginning to rise. The layer thus removed is put back into place and fastened around the trunk to prevent injury from dry, hot winds and from fire, and incidentally to prevent a second development of worthless male cork.

Only the new cork which now begins to form is of commercial value. The first harvest is taken when the newly formed bark has reached a thickness of about one inch. When cut the cork rolls up, forming tubes the size of the trunk from which it was taken. It is then boiled in water to increase its bulk and elasticity after which it is submitted to pressure which flattens it. It is then cut into various articles as desired. Cork of this quality is used mostly in the manufacture of life preservers, in floats for fish nets, and for lining life boats.

After the tree is thirty years old its bark may be peeled at intervals of from six to ten years, the product increasing in firmness and value with each peeling. The best layers for fine cork are those produced after the tree is fifty years old. Removal of the cork is said to be beneficial to the tree and if properly removed the trees flourish for upward of 150 years.

In Hall 28 there is shown a large specimen of cork representing the third peeling of a young tree and a large assortment of articles manufactured from this useful product.

A BOOK FOR CHILDREN ON BIRD MIGRATION

Traveling with the Birds, a book beautifully illustrated with twelve large color plates, and said to be the most easily understood work on bird migration, is now on sale at Field Museum. The author is Rudyerd Boulton, well-known ornithologist and Assistant Curator of Birds at the Museum. The color plates are by Walter Alois Weber, an artist formerly on the staff of the Museum.

While the book is especially written and designed for children, it is equally interesting to adults. The sixty-four pages of text, treating the subject in the most popular style and simplest terms, are profusely interspersed with black and white illustrations in addition to the color plates. The book is 10 by 12 inches in size, and printed in large clear type. It is bound in full cloth, and comes in an attractive multi-colored jacket. M. A. Donohue and Company are the publishers. The book is obtainable at Field Museum at \$1.00 per copy, plus 15 cents for postage if ordered by mail.

HOW SUMATRAN MAGICIANS "BRING THE DEAD BACK"

Primitive tribesmen of the island of Sumatra believe that the spirit of a dead person returns a few months after his funeral for one last celebration with his relatives and friends. This belief, according to Dr. Berthold Laufer, Curator of Anthropology, is fostered by a form of faked spiritualistic seance devised by native magicians who dominate the lives of their less crafty fellow tribesmen.

When the time arrives for the return of a spirit, the magicians make a wooden figure in the image of the deceased. The head, arms and legs of the figure are hinged, and connected with strings placed on it underneath the clothing. At the place of assemblage for the ceremony, the figure is placed before the people in semi-darkness, in such a position that the mechanics of the scheme cannot be seen. The tribesmen begin their ceremonial singing and dancing. A magician solemnly summons the dead to join them, and to indicate that he is amongst them by letting his spirit enter and animate the figure of his body.

The magician then manipulates the strings, and the figure moves its head, and jerks its arms and legs as if it were joining in the dancing. This, the natives believe, is the last communication of the spirit with his relatives. After the ceremony the spirit is thought to separate itself forever from the living.

One of these figures, complete with its strings, is on exhibition in Hall G (Arthur B. Jones Collection). It was used by magicians of the Toba Batak tribe and was brought from Sumatra by the Arthur B. Jones Expedition to Malaysia.

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 1: Monday—New Year's holiday, no tour; Tuesday—Moon, Meteorites and Minerals; Wednesday—Animal Habitat Groups; Thursday—General Tour; Friday—Ancient Burials.

Week beginning January 8: Monday—Makers of Totem Poles; Tuesday—Plant Fibers and Their Uses; Wednesday—Life in Northern Lands; Thursday—General Tour; Friday—Chinese Art.

Week beginning January 15: Monday—Work of Heat, Wind and Water; Tuesday—Bird Life in Many Lands; Wednesday—Musical Instruments; Thursday—General Tour; Friday—Gems and Jewelry.

Week beginning January 22: Monday—Hall of Systematic Mammals; Tuesday—Plants and Animals of Long Ago; Wednesday—Primitive Costumes; Thursday—General Tour; Friday—Looms and Textiles.

Week beginning January 29: Monday—Cats and Dogs; Tuesday—Palms and Cereals; 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 Dr. Berthold Laufer—a lacquered arm-rest of the K'ien-lung period (1736-95), China; from Mrs. Ynes Mexia—27 herbarium specimens, Brazil; from Dr. Earl E. Sherff—40 herbarium specimens, mostly Hawaiian; from the Firestone Tire and Rubber Company—6 sample sheets of various grades of rubber, Liberia and Sumatra; from James Zetek—73 herbarium specimens, Canal Zone; from Phil G. Zalsman—4 brook trout, Michigan; from Charles F. Walker—4 tree frogs, Ohio; from Miss M. B. Baker—a pine grosbeak in the flesh, Illinois; from H. M. Bower—4 butterflies, Michigan; from H. B. Conover—a pheasant and a bobwhite, Illinois; from the John G. Shedd Aquarium—20 specimens of fish; from J. H. Robinson—58 insects; from Henry Dybas—4 beetles, Illinois and Indiana; from the Charleston Museum—6 rock sea bass, 14 grass pickerel, and a chain pickerel, South Carolina; from Edward Brundage, Jr.—231 insects and 2 hairworms, United States; from Albert B. Wolcott—173 insects, Illinois and Indiana; from Burnham S. Colburn—5 specimens of minerals, North Carolina; from John W. Jennings—a slab of polished chalcidony, Arkansas; from Floyd Markham—3 invertebrate fossils, Illinois.

NEW MEMBERS

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

Associate Members

Charles M. Geringer, Mrs. Carroll L. Griffith, August Kochs, L. B. Logan, Mrs. Robert Mandel, Alwin Frederick Pitzner.

Annual Members

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Male Glacier Bear Deserts Family

While its cubs are small, the male glacier bear leaves home and does not associate with its mate and offspring. For an extended period the family is entirely in charge of the mother. A group of a mother and three cubs, shown in a reproduction of their natural habitat near Yakutat Bay, Alaska, is on exhibition in Hall 16. Glacier bears are very small, and are colored a beautiful bluish-gray. They are found only in Alaska.

A model of one of the largest and most modern types of flour mills is shown with the grain exhibits in Hall 25.

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RARE BONGO, COLLECTED BY WHITE-COATS EXPEDITION, IN HABITAT GROUP

BY WILFRED H. OSGOOD
Curator, Department of Zoology

Africa, which is headquarters for antelopes, produces so many kinds that all of them cannot be shown even in such a large display as that provided for in Carl E. Akeley Memorial Hall (Hall 22). There are some, however, that are so interesting and so striking in appearance that they demand admittance, and in all plans for expansion space is reserved for them. One of these is the rare and beautiful species known as the bongo, which now is represented by a magnificent group, completed in January, specimens for which were obtained by Captain Harold A. White of New York and the late Major John Coats of Ayrshire, Scotland, on their African expedition for Field Museum in 1930.

The bongo is the most brilliantly colored of all antelopes or, for that matter, of all hoofed mammals. It is, in fact, a veritable harlequin among large animals. Its body color of bright tawny-ochraceous is almost blazing in intensity and against this are ten or more vertical white stripes very sharply defined. Further contrast is offered by rich markings on the head and legs. It is unusually massive in form, standing about four feet high at the shoulder and perhaps reaching a weight of 500 pounds.

One of the first to call attention to the bongo was the famous traveler Paul du Chaillu, who found it in the forests of West Africa in 1856 and brought complete skins to Europe. These doubtless came from native sources, and it was not until more than fifty years later that the animal was actually killed by a white man. Meanwhile, it was thought to be wholly confined to West Africa, but it is now known to range

eastward through the forest zone to the upper Congo region and even to restricted mountain forests in Kenya Colony. Slight distinctions have been drawn between eastern and western specimens, but the general characters are the same and the animal is so rare that conclusions must be regarded as tentative.

Few animals are more difficult to hunt than this one. It frequents bamboo thickets and dense forest undergrowth where following it quickly or quietly is nearly impossible.

breaks of good luck than we did the first two weeks on the Aberdares. The bongo live there at an altitude of 10,000 feet in the thick bamboo forest where the sun hardly ever shines. It is raining there most of the time, but we got a break in the weather and did get some dry spells.

"After one week of hunting twelve hours a day in that terrible forest, an old native tracker brought us into the heart of the bamboo forest where we discovered an old salt lick that his father had told him about

and which had been lost to the younger generation. Here, early one morning, we saw a herd of over thirty bongo just entering the forest, and we picked our female and young yearling out of this group. Several days later, after waiting all night at this lick in terrible cold and rain, we shot a large bull just coming down to drink."

Although the similarity is not very close, the bongo is probably more nearly related to the eland than to the smaller bushbucks and harnessed antelopes with which it was once classified. The eland inhabits open country or light scrub, while the bushbucks are forest

dwellers. The bongo combines some of the structural characters and some of the habits of both. It shares with the eland the possession of horns in both sexes, the large size, the striped body, and the long bovine tail. Like the eland, also, it has the herding habit, whereas the bushbucks and forest antelopes in general are more solitary. Therefore it is likely that it is descended from a plains-inhabiting ancestor.

The Museum's group was prepared by Staff Taxidermist C. J. Albrecht. The painted background is by Staff Artist Charles A. Corwin.



Group of Bongo in Carl E. Akeley Memorial Hall

These rare antelopes of Africa are seldom seen, either in museums, or alive in their homeland. The specimens in this exhibit were collected by the Harold White-John Coats African Expedition of Field Museum.

Natives capture it in deadfalls and concealed pits along its trails, but white men rarely find it. In spite of its striking coloration, it is not easy to see, for the broken pattern, like that of the tiger, has a concealing effect against a background of vines, branches and alternating light and shade. The hunter's feeling in regard to it is well indicated by the following quotation from a letter sent from Africa by Captain White shortly after the specimens for the group were taken:

"In all of my hunting experience, I have never hunted quite so hard nor had more

FOSSIL MARSUPIAL DISCOVERED BY MUSEUM PALEONTOLOGIST

An important scientific discovery—a hitherto unknown South American prehistoric animal of large size and most unusual physical characteristics, which appears to have been one of the greatest killers of its time, some two million years ago—has been announced by Professor Elmer S. Riggs, Associate Curator of Paleontology at Field Museum.

The animal, recently described in a published report for the information of other scientists, was discovered in the

Argentinian province of Catamarca by Professor Riggs when he was in the field as leader of the Marshall Field Paleontological Expedition to Argentina. The skulls and parts of skeletons of the species brought to the Museum are the only specimens in the world so far as is known to date.

Like the well-known sabertooth tiger which died out a few thousand years ago, the new animal has long pointed tusks which must have made it a formidable attacker, but its further peculiarity lies in the fact that it carried its young in a pouch like such marsupial animals as the kangaroo

and the opossum. It has therefore been named *Thylacosmilus* (marsupial sabertooth) by Mr. Riggs. The animal had a massive head, and was larger in body than a modern North American mountain lion.

The sabertooth marsupial lived in South America long before the sabertooth tiger, which found its way to most parts of the world, reached that continent.

Among the contemporary creatures inhabiting the world with the newly discovered fossil animal were the giant sloths and the armored glyptodonts, upon which the marsupial may have preyed.

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:

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, 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 EXTENDED EDUCATION TO NEARLY 4,000,000 DURING 1933

Totaling the number of visitors received at the Museum with the number of persons reached by the extra-mural activities of the institution, such as those conducted by the N. W. Harris Public School Extension Department and the James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures, it is found that approximately 4,000,000 persons came directly within the compass of the Museum's educational influence during 1933.

The total number of visitors received in the Museum building during the year was 3,269,390. In addition to these, approximately 661,000 children received natural history instruction outside the Museum building through the activities of the Harris Extension and the Raymond Foundation. The Harris Extension circulates some 1,300 traveling exhibits throughout the Chicago school system which are seen daily by about 500,000 children, and the Raymond Foundation sends out lecturers who were heard in 1933 by about 161,000 children in their classrooms and assemblies. These outside lectures are only part of the Raymond Foundation's functions. The Foundation also presents series of free motion pictures for children in the James Simpson Theatre, which were attended by 25,950 children in 1933, and provides lecture tours of the exhibits for groups of children visiting the Museum, in which 11,470 participated. The lectures for adults given in the Simpson Theatre were attended by 22,787 persons in 1933, and 13,312 participated in the guide-lecture tours provided for adults.

ARCHAEOLOGICAL EXPEDITION TO CENTRAL AMERICA

An archaeological expedition, sponsored jointly by the Carnegie Institution of Washington, D.C., and Field Museum, sailed from New Orleans for British Honduras on January 24. It is under the leadership of J. Eric Thompson, Assistant Curator of Central and South American Archaeology at Field Museum.

Excavations on a Maya site near San José, in the western part of the country, which were begun in 1931 by Mr. Thompson as leader of the Third Marshall Field Archaeological Expedition to British Honduras, will be continued. It is hoped to solve certain problems of history raised by the discovery of pottery of a non-Maya type in burials at this typical Maya center.

An attempt will be made also to locate a large Maya site reported by chicle collectors to exist near the British Honduras-Guatemala border. The expedition will remain in the field about four months.

METEORITE CRATERS

BY HENRY W. NICHOLS

Acting Curator, Department of Geology

A meteorite crater is a pit made by the impact of a huge meteorite when it strikes the earth. Such craters can be formed only by meteorites of enormous size and, fortunately for the safety of human life, few such gigantic meteorites have fallen if the scarcity of meteorite craters may be taken as evidence. A meteoritic origin has been ascribed to nine or more craters and groups of craters, but this origin is generally recognized for only five of them. Although meteorites of ordinary size are often accompanied during their passage through the air by impressive phenomena of light and sound, the effect on

the ground they strike is insignificant and limited to penetration of a few feet at most.

A meteorite reaches the upper limit of the air with a velocity of between eight and forty-five miles per second. At this speed the friction of its passage through the air heats the surface to brilliant incandescence. This friction acts as a brake and so slows the meteorite that by the time it reaches the earth it has only the velocity of an ordinary falling body.

What happens when a meteorite weighing thousands or millions of tons falls is different. Owing to its weight its momentum is so great that the speed is not greatly checked during the few seconds of its passage and it strikes with much greater force than does an ordinary meteorite. The effect of the stroke is like the impact of a shell from a high-powered gun, but it is incomparably more destructive. The meteorite, in spite of its high speed and great weight, cannot penetrate far into the earth but is stopped within a few hundred feet at most. As a consequence the entire energy of its motion is suddenly changed to heat, a heat so intense that much of the meteorite and part of the surrounding rock is vaporized. This rapid generation of a large volume of gas gives rise to a violent explosion which forms the crater. Meteorite craters, therefore, are not merely dents on the earth's surface made by impact, but are true explosion craters similar to those formed by military mines.

The largest known meteorite crater, that of the Canyon Diablo meteorite of Arizona, is three-quarters of a mile in diameter and 570 feet deep. It has been estimated that the meteorite that made this crater was 500 feet in diameter and weighed more than a million tons.

A large case in the meteorite collection of Field Museum is filled with meteorites from this crater. A smaller crater near Odessa, Texas, is represented by two meteorite fragments. There have just been added to the collection eighteen specimens from the group of meteorite craters at Henbury, Australia, which show meteorites and also the lava and silica-glass into which some of the rock from the crater walls has been changed by the heat resulting from the impact of a shower of gigantic meteorites.

These craters were, until lately, supposed to be merely dents from impact of the meteorites. This origin was disputed by many, as evidence of explosive action in the craters was always present. Careful study of these craters by Dr. L. J. Spencer of the British Museum has largely removed doubts of their origin by demonstrating the explosive effects that accompany the impact of the meteorites.

Jungle Telegraph

A primitive form of telegraph—signaling from place to place by means of drums—is still in wide use by natives of the many islands of the South Pacific. A very complex system of signals, amounting to what may be called a "drum language," is employed, so that a wide variety of messages may be sent. The drums used, which can be heard for several miles, are made from large sections of hollowed-out tree trunks. Several specimens of these drums, elaborately carved with figures of significance in the native religions, are on exhibition in Joseph N. Field Hall (Hall A). There are usually handles at each end, sometimes in the shape of human figures. The hollowing out and carving are done with crude tools of stone, shell, and metal, and are laborious tasks.

GROUP OF SWISS LAKE DWELLERS IN HALL OF STONE AGE

BY HENRY FIELD

Assistant Curator of Physical Anthropology

The eighth* group in the Hall of the Stone Age of the Old World (Hall C) shows an early morning scene at a Swiss Lake Dweller village at Neuchâtel, Switzerland.

Centuries before the dawn of history in Europe, people in a neolithic stage of culture settled around the lakes of Switzerland, building their homes on pile-supported platforms over the water. The migration to that region must have taken place thousands of years before the Christian era. Iron implements, and Roman tiles and coins, found in the upper layers of some of the sites, give some indication of the approximate date at which Lake Dweller culture ended.

During 1853-54 the lakes of Switzerland receded to an unusually low level. Villagers, seizing an opportunity to secure more land on the shores for their vineyards, found in the new ground wooden piles, stags' horns and stone implements. These discoveries marked the beginning of study of the Lake Dweller culture. Since that time hundreds of sites have been excavated.

The Swiss Lake Dwellers were an indus-

animal horns, teeth and bones. The Swiss Lake Dwellers were successful hunters, in spite of the fact that, judged by modern standards, their weapons might be considered wholly inadequate. They captured bears and wolves, as well as stags, wild boars and bison. A few fragments of leather suggest that the skins were partially prepared and possibly used for clothing.

The Lake Dwellers, last of prehistoric peoples, took great strides toward civilization. Living in large, settled communities, men learned to cooperate with each other and to have some thought for the common good. The raising of cattle, cultivating of grain, and storing of food indicate a desire to provide for the future which was probably lacking in their predecessors. Such practices also must have developed the sense of property to a greater degree than ever before. Commerce developed within the community and with the outside world, spreading knowledge and ideas from group to group.

In the Museum's Lake Dweller group two fishermen are seen on the beach hauling in their seine, which holds the morning catch of fish. In the background are pile-supported



Copyright Field Museum of Natural History

Life When the Dawn of History Was Approaching

Swiss Lake Dwellers and their village erected on piles over the water, as restored in group in the Hall of the Stone Age of the Old World. These people developed a culture which presaged what we know as civilization.

trious people, and their earliest remains suggest a relatively complex social organization. The hundreds, sometimes thousands, of wooden piles found in each site, indicate that they lived in large communities. Their huts, built on platforms supported by piles near the shores of lakes, possessed unquestionable advantages, for some of these were connected with the shore only by wooden bridges, and others could be reached only by canoe, which assured reasonable safety from attack. Such dwellings also enabled the people to catch fish with considerable ease.

From the number of their industries we may presuppose a division of labor. They raised cattle, an occupation requiring continuous care and foresight, as did the cultivation of the ground and the sowing and reaping of harvests. Among the plants they cultivated was flax, which they spun into thread, and used for weaving cloth and making fishnets. They manufactured pottery, and the variety of their tools and implements testifies to their deftness. Implements were made from wood, stone, and

platforms with huts built upon them, where the daily activities are starting.

Sculptor Frederick Blaschke modeled the two figures of the men, and the painted scene is the work of Charles A. Corwin, Staff Artist. The group was planned and directed by the writer. In preparation for this work, a reconstruction of a Lake Dweller scene was painted at Neuchâtel by Charles R. Knight, with the technical advice of Dr. Paul Vouga, who is in charge of the local museum.

MUSEUM OFFICERS RE-ELECTED

At the Annual Meeting of the Board of Trustees of Field Museum, held January 15, all officers of the institution who served during 1933 were re-elected. President Stanley Field was re-elected, for the twenty-sixth time, to the office he has held continuously since January, 1909. The others re-elected to their respective offices are Albert A. Sprague, First Vice-President; James Simpson, Second Vice-President; Albert W. Harris, Third Vice-President; Stephen C. Simms, Director and Secretary; and Solomon A. Smith, Treasurer and Assistant Secretary. There were no changes on the Board of Trustees

MRS. OSCAR STRAUS SPONSORS EXPEDITION TO AFRICA

An expedition, to be known as the Straus West African Expedition of Field Museum, left Chicago January 17. Driving to New York in a passenger automobile and a motor truck which are to be used in the field, the expedition embarked on a steamer for Dakar, in the French colony of Senegal, on January 25.

The expedition is sponsored by Mrs. Oscar Straus of New York, widow of a former American ambassador to Turkey who became Secretary of Commerce in the administration of President Theodore Roosevelt. Jesse Isidor Straus, the present ambassador to France, is Mrs. Straus's nephew.

At Dakar the expedition will be joined early in February by Mrs. Straus herself, who is stopping in France on her way to Africa. She will accompany the party during about two months of work and travel in Senegal and contiguous territory. The expedition will continue in operation some six or seven months, during which it will cover about 4,000 miles in regions ranging from the barest desert to the most luxuriant forest in the world.

Rudyard Boulton, Assistant Curator of Birds at Field Museum, is the scientific leader of the expedition. Mrs. Boulton is accompanying her husband to carry out a commission she has received from the Carnegie Corporation of New York to make phonograph records of the native music of African tribes. Frank C. Wonder of the Museum's taxidermy staff is the mammal collector of the expedition, and John F. Jennings of Chicago is photographer.

After leaving Dakar the expedition will motor through Senegal and other parts of West Africa to Timbuktu, collecting birds and mammals, and recording native music, on the way. Thence the party will drive to Kano in northern Nigeria, and work through Nigeria to Lagos. Collecting will be done principally in the dry thornbush country on the southern edge of the Sahara Desert during the first three months.

From Lagos Mr. Wonder will proceed to collect small mammals in the low rain forests and on the plateau boundary between Nigeria and Cameroon, while the Boultons will board ship for Angola (Portuguese West Africa) where they will continue research they began on two previous expeditions. Mr. Boulton hopes to collect specimens for three or four habitat groups of unusual birds to be installed in a proposed new hall of foreign birds at the museum. Among the principal objectives of the collectors will be a nesting colony of weaver birds, a group of giant plantain eaters, and a group of helmeted hornbills, all of which are birds difficult to obtain and little represented in museums at present.

New Guinea Hairdressing

An interesting example of elaborate hairdressing is exhibited in Joseph N. Field Hall (Hall A) in the collection from the south coast of Dutch New Guinea. The rather short curly hair of a native is divided into many separate strands, to each of which long strips of fiber are fastened. Some of these are again gathered together into bundles with various ornaments attached. This is done in various ways, depending upon the sex and age group of the individual. The style for each group is more or less fixed, and on rising to an older group the whole hairdress is frequently cut off short, and the hair allowed to grow out afresh.

*The other seven groups—Chellean, Neanderthal, Aurignacian, Solutrean, Magdalenian, Azilian and Neolithic—have been pictured and described in FIELD MUSEUM NEWS, issues of July, 1933, to January, 1934, inclusive.

LECTURER WITH TAME EAGLE TO APPEAR MARCH 3

Captain C. W. R. Knight and "Mr. Ramshaw" of London will appear at Field Museum on Saturday afternoon, March 3, in a lecture for adults to be presented in the James Simpson Theatre at 3 P.M.

"Mr. Ramshaw" is an unusual and interesting bird—an eagle which has the unique distinction of being tame. At the lecture he will assist Captain Knight in entertaining the audience. The title of Captain Knight's lecture is "Monarchs of the Air," and it will be illustrated by motion pictures.

This lecture is the opening one of the sixty-first course presented by the Museum, which will comprise seven other lectures to be given on successive Saturdays during March and April. The complete schedule for the 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.

PROGRAMS FOR CHILDREN —RAYMOND FOUNDATION

During February there will be two special programs of free motion pictures for children at the Museum under the provisions of the James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures. One of these will be given on Abraham Lincoln's birthday, Monday, February 12, when the film, "Abe Holds Court," will be shown. On Washington's birthday, Thursday, February 22, the film, "Washington and His Times," will be presented.

The regular spring series of Raymond Foundation programs will begin on Saturday morning, March 3, with a program consisting of motion pictures entitled "Mexico, the Picturesque," "The Aztecs," and "The Alligator Family."

Eight other programs to be given 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.

CHINESE FANS

A comprehensive exhibit of rare and exquisite fans of various types from China, together with unusual examples of highly decorative brocade and embroidered scent bags, money bags and spectacle cases, has been installed in the hall of Chinese and Tibetan ethnology (Hall 32, West Gallery). Included are folding fans, feather fans (both rigid and folding), gauze fans, and palm leaf fans. A section of the exhibit is devoted to illustrating the various stages in the manufacture of a folding fan. Most

of the specimens were collected by Dr. Berthold Laufer, Curator of Anthropology, while leading the Marshall Field Expedition to China some years ago.

The feather fan represents the oldest form of fan made by the ancient Chinese, and is characteristic of the culture area of northern China, while the palm leaf fan was invented in southern China and is still principally used there, according to Dr. Laufer. In making the feather fans the quills of wild geese, herons, hawks, bustards and peacocks are used. The gauze fans are usually mounted in rims of bamboo or other wood, or ivory. The folding fan was probably invented in Korea, and has become known in China from the eleventh century onward. First restricted to the demi-monde, it soon became fashionable among women generally. In China fans are used equally by both sexes, those for men being larger and having distinctive forms. Fans inscribed with complimentary poems are given to friends as we send various forms of greeting cards.

NEW PLANT EXHIBITS

Several interesting additions have recently been made to the exhibits in the Hall of Plant Life (Hall 29). One of these represents a branch of the cupuassu tree of the



Cupuassu Branch

Flowers, fruit and leaves of a tree related to the cacao, as shown in Hall of Plant Life. Below the branch is seen a fruit cut open to expose its interior.

American tropics. This is a large handsome tree related to the cacao, and bears fruit resembling large cacao pods. Its seeds are sometimes used as a substitute for the true cacao in the production of chocolate, but the cupuassu is esteemed especially for the fragrant sweet-acid pulp which envelops its seeds within the pod. In addition to the branch with flowers, fruit, and leaves, there is shown a model of a fruit cut open to expose its interior.

To the exhibit of sour-sops there has been added a branch of biribá with leaves and fruit. It is one of the largest and most delicious of tropical fruits, on the order of the cherimoya. To the witch-hazel group of plants there has been added a branch of the sweet gum known as liquidambar.

The exhibits were prepared in the Stanley Field Plant Reproduction Laboratories. The first two are from material obtained in Pará by the Marshall Field Botanical Expedition to the Amazon.

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:

Thursday, February 1—General Tour; Friday—Egyptian Exhibits.

Week beginning February 5: Monday—Fruits and Nuts and Their Uses; Tuesday—Horned and Hooded Animals; Wednesday—Pewter, Jade and Gems; Thursday—General Tour; Friday—Men of the Stone Age.

Week beginning February 12: Monday—Snakes and Lizards; Tuesday—Prehistoric Plants and Animals; Wednesday—Archaeology of North America; Thursday—General Tour; Friday—Turpentine, Lacquer, Copal and Amber.

Week beginning February 19: Monday—Crystals and Their Uses; Tuesday—Primitive Uses of Bark and Fibers; Wednesday—Animal Ecology; Thursday—General Tour; Friday—Hall of Races of Mankind.

Week beginning February 26: Monday—Peat and Coal; Tuesday—Indians of Plains and Deserts; Wednesday—Bird Life in Asia and Australia.

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 A. H. Andrews—2 chayote fruit specimens, Florida; from James Zetek—25 herbarium specimens, Barro Colorado Island; from Richmond Cedar Works—a board of southern white cedar, Virginia; from Dr. E. E. Sherff—102 herbarium specimens, Hawaii; from John G. Scheibner—a specimen of stigmaria, Illinois; from Dr. E. M. Gunnell—a specimen of fluorite, Ohio; from Rudyerd Boulton—32 bird skeletons, Illinois; from Karl Plath—4 bird skeletons; from Lincoln Park Commissioners—2 bird skeletons; from Bryan Patterson—12 bird skeletons, Colorado; from H. B. Conover—4 bird skeletons, Illinois; from Dr. Florentino Felippone—3 bats, Uruguay; from William J. Chalmers—2 photographs of sable antelope and wildebeest, with map and guide to Kruger National Park; from Harry D. Oppenheimer—a mounted bat, Trinidad, and a "crucifix fish" skeleton; from Professor W. C. O. Hill—a negocoll cast of the face of a Vedda, Ceylon.

NEW MEMBERS

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

Associate Members

William Burry, Jr., E. K. Collison, Mrs. Carrie L. DesJales, Miss Ruth H. Matz.

Annual Members

Frank W. Allen, Mrs. Lloyd Arnold, Walter E. Ehrman, Dr. Thomas M. French, Edward T. Griesel, Roy S. Jeffers, William S. Lieboner, C. G. Simpson, Otto A. Sjostrom, William H. Symmes.

Museum Radio Talks Continue on WGN

Two of the series of radio talks concerning Field Museum, presented through the courtesy of WGN, the Chicago Tribune radio station, will be given during February. Dr. Wilfred H. Osgood, Curator of Zoology, will outline the work of his department in a lecture to be given at 4 P.M. on February 9; and Miss Margaret M. Cornell, Chief Guide-lecturer, will tell about the activities of the James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures at the same hour on February 23.

Botanist Promoted

Llewelyn Williams, Assistant in Wood Technology in the Department of Botany, has been promoted to the position of Assistant Curator of Economic Botany, effective from January 1.

Field Museum News

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THE BEGINNING OF LIFE, A BILLION YEARS AGO, IS SUBJECT OF MURAL

By HENRY W. NICHOLS

Acting Curator, Department of Geology

Life nearly a thousand million years ago is the subject of one of the paintings by Charles R. Knight which appear on the walls of Ernest R. Graham Hall (Hall 38). The picture represents pools of hot water fed by hot springs such as may be seen in Yellowstone Park at the present time. Numerous rounded lumps of limestone are growing in the pools. These lumps are colonies of cryptozoa, primitive plants of the class of algae now represented by the seaweeds. The fossils of these are the earliest remains of life yet discovered.

These algae grew as a thin coating on rocks. They excreted, as some modern algae do, a substance which precipitated lime from the surrounding water, and thus covered themselves with a thin coat of limestone. The algae penetrated and grew over this limestone coating and formed a second stone layer over the first one. Growth continued until the nodules were of considerable size, some exceeding two feet in diameter. These nodules, owing to their mode of formation, have a laminated structure like that of an onion.

The remains of such fossils are abundant in some parts of the world, notably in Montana and parts of Canada, where they form thick beds of limestone. The picture shows the conditions under which some of them were formed; what they looked like is also shown by some of the fossils themselves exhibited near-by. The cryptozoa exhibited are from a somewhat later period, but are otherwise essentially the same as those in the painting. They are accompanied by specimens of the eoazon, for years the subject of much controversy in geological circles. If the eoazon is a true fossil, as is most probable, it is the oldest one in the collection. When it was discovered by Sir William Dawson he thought it was an animal and called it *Eoazon canadense*, which means, the "dawn animal of Canada." A controversy over its nature lasted for years, but now it is generally, though not universally, accepted as an alga much like the cryptozoon.

Owing to the dispute over the eoazon, the cryptozoa as pictured in the mural must be considered the remains of the earliest life of which actual fossilized remains have been discovered and certainly identified.

They grew during the Huronian period of the Proterozoic era, nearly a billion years ago. Even at that early time the earth's climates were of the same general nature as climates of all later times, including the present. There were alternations of mild and cold climates and even glacial periods.

Although these cryptozoa are the oldest fossils known, there is reason to believe that they do not represent the earliest life. The algae, although primitive in character, are not the most primitive forms of life, and

there is more carbon in the form of graphite in the rocks of a single period of the Archaeozoic era than there is in all the coal of the Carboniferous period.

Life on earth began some time during the unrecoverable beginnings of earth history, a time so remote that all rocks formed then have since either disappeared or changed so as to be no longer recognizable. Various theories of how life originated have been propounded, but there is little to substantiate any of them and they can all

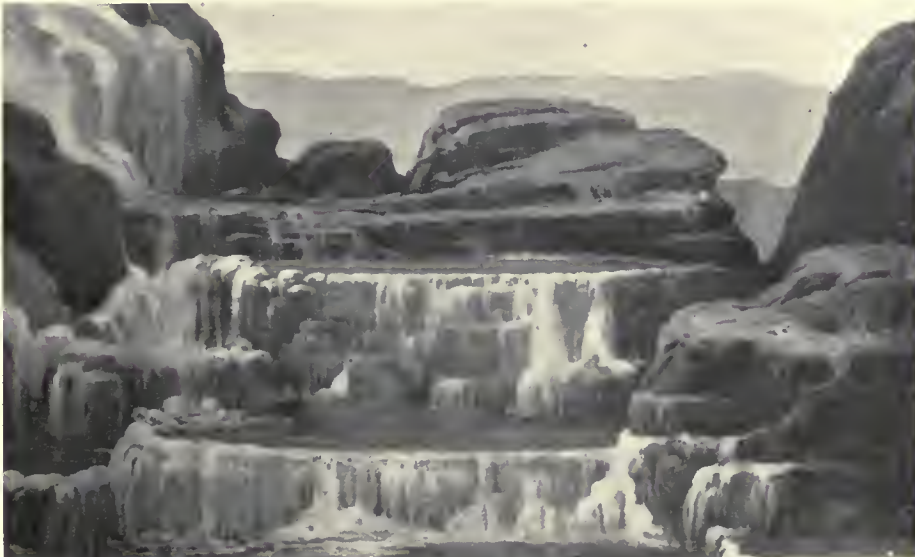
be taken as little better than guesses. Two that seem least probable are interesting because they postulate that life came to earth from other planets. The noted physicist, Arrhenius, thought that the pressure of light waves was able to drive germs from the outer atmosphere of planets into space and that some of these might reach the earth. Dean Charles B. Lipman of the University of California believes that bacteria reach the earth in the interior of meteorites (as noted in the March, 1933, issue of FIELD MUSEUM NEWS), but geologists believe that conditions of outer space are such that no germ could make such a journey and live. They believe that life originated on

the earth itself. It is possible that during the formative period of the earth's history some contacts between gases, water, and other substances may have gradually evolved a primordial protoplasm, the physical basis of all life. This is, however, extremely vague, and we can only say that the origin of life remains a mystery.

Warthog Enters Home Backwards

There is one animal which always goes into its home backwards. This suspicious creature, which fears to take its eyes from the possible approach of enemies as it enters its burrow, is the African warthog, of which several specimens are on exhibition in a group in Carl E. Akeley Memorial Hall (Hall 22). The animals, obtained in Somaliland, were mounted by the late Carl E. Akeley.

The warthog is so ugly that one writer has described it as "more like the incarnation of some hideous dream than any other living animal." It is a distant cousin of the domestic pig. It gets its name from warty protuberances on its face, which are especially marked on the male.



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Life Begins in a World Hitherto Uninhabited

Restoration, in painting by Charles R. Knight, of series of pools in which grew minute water plants, algae, first form of life of which remains are known and certainly identified. In Ernest R. Graham Hall.

it is probable that the simplest forms of living things were the first to appear. These earlier forms were small and soft-bodied. They had no hard shells nor skeletons to be preserved and hence left no fossils. The Huronian algae also would have left no fossils were it not for the formation of limestone crusts about them. These crusts are not true shells but merely a precipitation of lime which was caused by the excretions of the algae. Much later, in Cambrian time, necessity for body protection by a shell armor suddenly arose from some unknown cause, and at the same time hard skeletons for body support developed. Fossils from that time to the present are abundant.

Although the soft-bodied plants which came before the Huronian cryptozoa left no fossils, they did leave other traces by which we may infer their existence but not their characters. This evidence is the presence in the early rocks of enormous quantities of graphite, a form of carbon. This is probably a residue from the decay of primitive marine plants, much as coal is the residue from the decay of plants of a much later time. The vegetation of that early time must have been abundant, for

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:

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, 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.

BUCKWHEAT CAKES ORIGINATED IN ANCIENT TIBET

BY BERTHOLD LAUFER

Curator, Department of Anthropology

Buckwheat, although popularly conceived as a cereal all over the world because in every way it is used like wheat, is a polygonaceous plant, and one of the most graceful plants created by nature. Like our American Indians, the ancient Chinese assigned one of the five principal colors to each of the five "quarters" (counting the center as the fifth quarter) of the earth, and their botanists rejoiced in finding the five cardinal colors combined in the buckwheat plant: leaves green, flower white, stalk red, seeds black, root yellow. Therefore they regarded it reverentially as symbolic of the five quarters—as a symbol of the world. With their deep interest in plant life and agriculture the Chinese have produced an immense number of valuable books on botanical and agronomic subjects. If we want to study the early history, origin, and distribution of our cultivated and useful plants, we must consult, first of all, the records of the Chinese, which for many plants are the earliest extant. The history of buckwheat can be reconstructed only on the basis of Chinese sources. The oldest description of buckwheat is contained in a work on husbandry of the fifth century A.D., which gives sensible rules for the cultivation of the plant.

The Chinese, however, were not the first who brought the plant under cultivation. Buckwheat is a denizen of the highest mountain regions and, being able to withstand greater extremes of heat and cold than any other crop and being contented with the poorest soil, it occurs in the Himalaya Mountains in altitudes up to 11,000 feet. In the western Himalaya, including Kashmir, the bitter variety of buckwheat reaches altitudes even up to 15,000 feet, where no other crop is able to thrive, and it constitutes the only food of the inhabitants. The Tibetans and other mountain tribes related to them were the original buckwheat cultivators and the first buckwheat cake eaters; they produced a complete buckwheat culture complex, grinding the fruit into flour and making the flour into cakes, gruel, and beer, even utilizing the straw as fodder in the winter. Among some of these hill tribes buckwheat still forms the principal crop and the staff of life, as it has for at least 2,000 years. The Ordos Mongols and many tribes of northern Manchuria also subsist a great deal on buckwheat. The Chinese extol in particular the buckwheat of the province Hei-lung-kiang in Manchuria, saying that its flour is pure white, and furnishes the finest buckwheat cakes in the world. Besides cakes, the Chinese prepare noodles and dumplings from buckwheat flour.

Buckwheat first appeared in Europe as late as the latter part of the fifteenth century under a bewildering variety of popular names which point to a foreign origin but are too vague to assist us in determining the real country of origin. Thus the Spaniards and Portuguese called it "Moorish wheat," the Italians "Saracen grain"; hence French *sarrasin*. The Osmands dubbed it "Albanian millet," the Greeks "Arabic corn," and the Russians "Greek wheat," while Poles, Czechs, and Germans spoke of "Tartar" or "heathen corn." The English botanist John Gerard, in his famous *Herbal* of 1597, describes the plant under the names "French wheat" and "buckwheat," the latter being derived from Low German and Dutch

boekwete, that is, beech wheat, from a certain resemblance of the fruits to beech-nuts. The botanical term *Fagopyrum* is a translation of this name (Latin *fagus*, "beech"; Greek *pyros*, "wheat").

A generation ago it was believed that the Mongols on their invasion of Europe had carried buckwheat out of the interior of Asia into Europe. There is no evidence whatever for this speculation, especially as buckwheat made its appearance in Europe more than two hundred years after the Mongol invasion. New researches have led me to the conclusion that the plant spread from Kashmir into Persia, thence to Asia Minor and Greece, and from Greece to Italy, Russia, and on to the remaining countries of Europe.

Buckwheat was introduced from Europe into America in the sixteenth century. The Dutch colony of Manhattan Island sent buckwheat samples of American growth to Holland in 1626. J. Lawson, in his *History of Carolina*, wrote in 1714 that "buckwheat is of great increase in Carolina, but we make no other use of it than to feed hogs and poultry." Peter Kalm, who traveled in North America in 1748, observed that most farmers of New Jersey sowed the plant and made buckwheat cakes which, he writes, "are very good, and are likewise usual at Philadelphia and in other English colonies, especially in winter."

Specimens of buckwheat and other articles of food consumed by the Tibetans, as well as kitchen and household objects used in connection with these products, are shown in Case 44 in the West Gallery of the Museum.

Orchid Collected by Capt. Cook in 1769

Included in a collection of herbarium material received recently by Field Museum is a small orchid specimen of historic interest. It was collected in Tahiti in 1769 upon the occasion of the visit to that island of the famed explorer, Captain James Cook, in the course of the first of his three famous voyages of discovery. Two celebrated botanists, Banks and Solander, who accompanied Cook's first expedition, brought to Europe the first plants to reach that continent from Australia and many islands of the Pacific. For those unfamiliar with the condition of herbarium specimens preserved for so long a time, it may be stated that the present specimen is in quite as good condition as if it dated only to 1933.

While the Museum Herbarium has been formed during the past forty years, it has obtained through purchase and exchange many specimens collected more than a century ago. It is worthy of note that the Illinois Herbarium of the Museum, maintained as a separate unit, includes many plants collected before the Civil War, and later, on land then forested but now for many years covered by the pavements and buildings of Chicago.—P.C.S.

Cats of America

The six members of the cat family native to the United States—cougar or mountain lion, bay lynx (also known as bobcat and wildcat), Mexican jaguar, gray Yaguarundi cat, Canada lynx, and Mexican ocelot—are represented by specimens in the systematic mammal collection in Hall 15.

A model of the original petroleum refinery built by John D. Rockefeller, Sr., at Cleveland, Ohio, in 1863, is on exhibition in the Department of Geology.

ANIMAL COLLECTIONS RECEIVED FROM MANDEL EXPEDITION

The Leon Mandel Guatemala Expedition of Field Museum is making excellent progress in its work of collecting a comprehensive and characteristic representation of the Central American fauna. Two shipments, containing specimens resulting from the early weeks of its field work, have been received, and a third is reported on the way to the Museum.

The first shipment contained about two hundred birds, mammals, and reptiles. The most important item in this lot consists of some fifteen or twenty toucans and other birds, together with accessories, color notes, and additional material and data, for the preparation of a proposed habitat group.

The second shipment consisted chiefly of live animals, which the Museum has sent, on loan, to the Chicago Zoological Society's zoo at Brookfield, where they will remain during their lifetime. When they die, some of these animals will return to the Museum for addition to the exhibits and study collections of the Department of Zoology. Included among the live animals which arrived were three boa constrictors; two specimens of fer de lance, an extremely poisonous snake which is one of the most dangerous in tropical America; a coral snake, likewise an extremely poisonous species; two tree snakes; several other snakes; five iguanas or tropical lizards, some of them more than five feet long; two specimens of agouti, a queer hooved rodent with the habits of a small deer; a paca, a large brown spotted rodent which reaches a weight between forty and fifty pounds, and is similar to a guinea pig except in size; a specimen of Baird's Central American tapir, a very large species much different from the common tapir of South America; two specimens of the kinkajou, a nocturnal animal related to the raccoon, often mis-called "honey bear"; two guan birds, a variety of game bird somewhat like a pheasant; and several parrots and macaws.

Leon Mandel, sponsor of the expedition, who for a time was in Guatemala actively participating in the work, has recently returned to Chicago. Members of the expedition who will remain in the field for several more months are Karl P. Schmidt, Assistant Curator of Reptiles at the Museum, leader of the expedition; Emmet R. Blake, ornithologist; F. J. W. Schmidt, mammalogist; and Daniel Clark, general assistant.

Exhibit of Brush Materials

Many stiff vegetable fibers serve as material for brooms and brushes, and among them palm and grass fibers take high rank. Foremost among the palm fibers are the various kinds of piassava, obtained from the leaf sheaths of several species of South American and African palms. Bahia piassava, from a palm (*Attalea funifera*) growing in the state of Bahia, is coarser and stiffer than Pará piassava, from a different palm (*Leopoldiana piassaba*) of the middle Amazon region. African piassava is from the African wine palm (*Raphia vinifera*). Piassava fiber requires little preparation as it separates naturally from the leaf sheaths into coarse, flexible strands.

The commonest broom material of the United States is obtained from broom corn or sorghum (*Sorghum vulgare*).

An exhibit installed in Hall 28 shows broom corn, palm and other fibers used for brush-making, and also a series of brushes and brooms manufactured from these materials.

STRANGE FISH THAT CATCH OTHER FISH WITH BAIT

BY ALFRED C. WEED
Assistant Curator of Fishes

Catching fish with bait is an ancient occupation. Men have been doing it from very early times, but fish themselves began it long before any men existed. Angler-fishes are found in all seas, from the edge of the surf to extremely great depths.

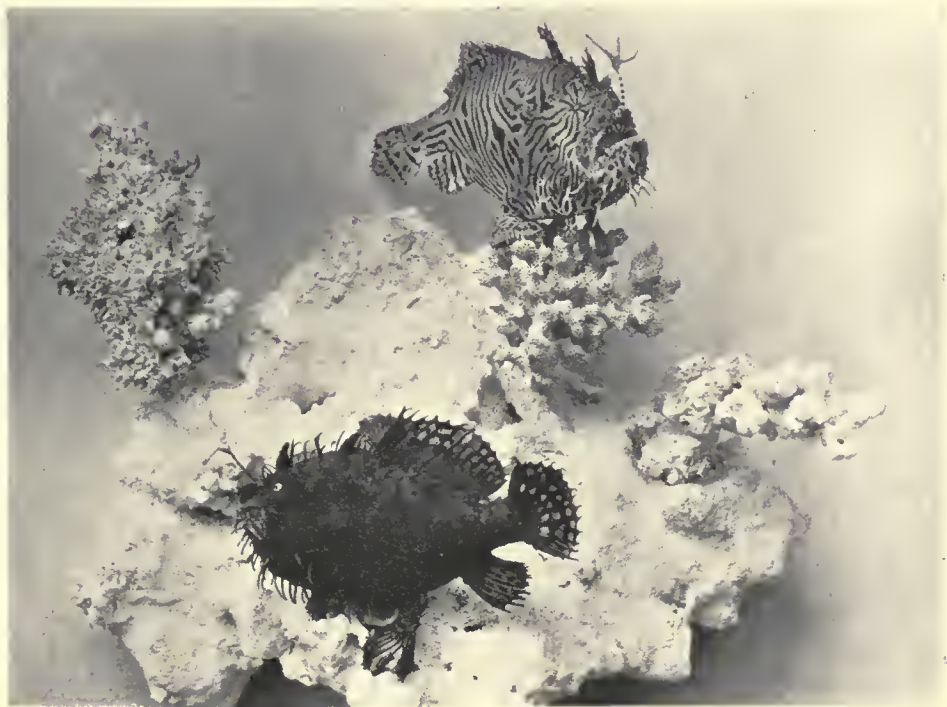
In keeping with their extensive distribution, the angler-fishes show great variations in form but are all alike in certain structural features. All have side fins developed and used as legs and feet. Curiously, what would normally be considered front legs are behind, and what would correspond to hind legs are in front; that is, the ventral (hind leg) fins are under the throat, and the pectoral (foreleg or arm) fins are near the tail. Strangest of all, they have on the head an organ consisting of a slender rod with a fleshy part at its tip used as a bait.

These fishes do their angling after the Eskimo fashion rather than that of the white

wave in the water and help to make the fish look still more like stones or other stationary objects which are usually covered with growths of plants or animals, commonly called "moss." The angling apparatus of *Antennarius* is of moderate size and the bait often looks like a worm.

Antennarius walks around on the ocean bottom or climbs through the coral in search of food. It seldom swims. When it is resting, it prefers to place one of its pectoral fins on something. A published account tells of one fish that always tried to get between two stones the right distance apart, rested on its ventral fins, braced its pectorals against the stones on either side and then bent its tail over the back, in the attitude of a boy standing on his hands. One that the writer watched in the aquarium always tried to rest near the side, so that it could place one fin against the wall, like a man putting his foot on a brass rail.

When the angler-fish is looking for food



Queer Denizens of the Sea

Two species of the strange angler-fishes, as shown in an exhibit in Albert W. Harris Hall. Aside from color, the striped fish above and the black one in the lower part of the picture are very similar in form and habits. Both come from Australian waters.

man. The Eskimo moves a piece of ivory in the water and, when a trout comes to look at it, strikes with his spear. The angler-fish waves its bait like a flag. When some small fish or crab comes to inspect it an immense mouth swallows the victim.

Some of the deep-sea anglers have very long fish-rods with strangely formed baits. Many of the baits are luminous.

Although most of these fishes live in very deep water and are rarely seen by fishermen, one group that lives at moderate depths, near shore, is more generally known. Most of these belong to the genus *Antennarius* and are commonly called anglers or fishing-frogs. Their bodies are rather irregular in outline, and their colors blend in with their surroundings so they can hardly be seen if they do not move. A coal-black *Antennarius* crouched on white sand appears to be simply a black stone. Its body is often covered with loose fleshy tags. These

it walks around until it sees something interesting, or hides quietly in some dark corner where it will not be noticed. If a small fish or other creature is likely to come within reach, the angler simply stays quiet or else waves its bait. It shakes the bait so violently that one would expect to see it torn to pieces. If a small fish seeks the cause of the commotion a large mouth opens and closes, and the fish disappears. Often the angler does not use its bait, but creeps up on its prey like a cat about to spring on a mouse or bird. At such times the bait becomes very small and lies almost hidden in a pit on top of the head.

Celluloid models of the black angler and of the striped angler have been prepared by Staff Taxidermist Arthur G. Rueckert from specimens collected in Australia and presented to Field Museum by the John G. Shedd Aquarium. They are now on exhibition in Albert W. Harris Hall (Hall 18).

SPRING LECTURE COURSE WILL BEGIN MARCH 3

The Sixty-first Free Lecture Course to be presented by Field Museum will open on Saturday, March 3. From that date until the end of April there will be lectures, illustrated with motion pictures and stereopticon slides, given on each Saturday afternoon, at 3 o'clock, in the James Simpson Theatre of the Museum. Following is the complete schedule of subjects, speakers, and dates for the nine lectures:

March 3—Monarchs of the Air

Captain C. W. R. Knight, London, England

March 10—The Passing of the Old West

Colonel Charles Wellington Furlong, F.R.G.S., Cohasset, Massachusetts

March 17—Miracles in Nature

Arthur C. Pillabury, Berkeley, California

March 24—A Naturalist in the Canadian Rockies

Dan McCowan, Banff, Canada

March 31—With Byrd to the Bottom of the World

Dr. Lawrence M. Gould, Carleton College, Northfield, Minnesota

April 7—The Wonderland of Mexico

Major James C. Sawders, Nutley, New Jersey

April 14—Massa-Magaga: Head takers of Formosa

Captain Carl von Hoffman, New York City

April 21—The South Sea Islands

H. C. Ostrander, Jersey City, New Jersey

April 28—Kakatoa: An erupting submarine volcano recorded in motion and sound

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

Children of Chicago and suburbs are invited to attend a series of free motion picture programs which will be presented at Field Museum on Saturday mornings during March and April under the provisions of the James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures. There will be nine programs, and each will be presented twice, at 10 A.M. and 11 A.M., in the James Simpson Theatre of the Museum. Following is the schedule showing the titles of the films to be shown on each date:

March 3—The Alligator Family; Mexico, the Picturesque; The Aztecs

March 10—Beach and Sea Animals; The Making of Maple Sugar; The Triumph of the Century

March 17—The Strange Maoris of New Zealand

March 24—Who's Who in the Zoo; Little Visitors from Foreign Lands; The Story of Tea

March 31—Sloths and Anteaters; Musko and Musme, the Japanese Wrestlers;

Quaint Boats on the Inland Sea; Japanese Children

April 7—The Settlement of Jamestown

April 14—The Elephant and Its Child; The Romance of Life; Across the Seven Seas; Thrills of Lumbering

April 21—The Collision of the Icebergs; Hunting Whales; A Mother Bear Fights for Her Cub

April 28—Neighbors of Simba, the Lion; Plants That Trap Visitors; By the Blue Mediterranean

FAVORITE GAME BIRDS SHOWN IN HALL 21

An exhibit of twenty-nine varieties of the gallinaceous game birds of North America—quails, grouse, partridges, pheasants, and their relatives—has been added to Hall 21. The exhibit is of special interest to sportsmen and amateur naturalists. All of the principal species of grouse and quail found in the United States and Canada, as well as others which occur in Mexico and the arctic regions, are included. Most of these birds are relatively large, and many have beautiful plumage. In some instances both male and female specimens are displayed, the total number of birds being forty-four.

Besides the common quails, bobwhites, ruffed grouse, and partridges of the eastern United States, there are shown certain varieties which have been introduced to this continent from abroad and have become native, such as the ringneck pheasant and the European partridge. The most spectacular bird in the exhibit is the wild turkey, formerly common in many parts of the United States, but today seldom seen outside of a few sections in the southern states and in Mexico.

One of the little-known species shown is the ptarmigan, which lives in the extreme arctic regions and reaches the United States only on the summits of the central Rocky Mountains. It is pure white in winter, but changes to a beautiful mottled brown and gray in the summer. The large booming blue grouse of the Rocky Mountains is also shown.

The exhibit includes several species which are really tropical, reaching only the southern border states of Texas, New Mexico, and Arizona. Among these are the chachalaca, related to the guan birds of Central America, the masked bobwhite, and the Montezuma or Massena quail.

These American game birds include some of the world's finest fowl for eating, the most popular being the turkey. Others highly regarded as food are the ruffed grouse, blue grouse, and prairie chicken, the last of which formerly was shipped into Chicago by the carload for marketing, but now is very scarce in this part of the country. Only one extinct bird is shown—the heath hen, an eastern variety of prairie chicken of which a number were preserved under protection on Martha's Vineyard island, Massachusetts, until two years ago when the last one died. The exhibit was prepared by Staff Taxidermist Ashley Hine.

Another Radio Lecture on WGN

Continuing the series of radio talks about the activities of Field Museum, presented through the courtesy of WGN, the *Chicago Tribune* station, Director Stephen C. Simms will speak on Friday, March 9, at 4 P.M. His subject will be the work of the N. W. Harris Public School Extension of the Museum.

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:

Thursday, March 1—General Tour; Friday—Peoples of the South Seas.

Week beginning March 5: Monday—Animals of the Chicago Area; Tuesday—Trees and Wood Products; Wednesday—Mexico before the Spaniards; Thursday—General Tour; Friday—Prehistoric Life.

Week beginning March 12: Monday—Habitat Groups; Tuesday—Indians of the Great Lakes Area; Wednesday—Etruscan and Roman Exhibits; Thursday—General Tour; Friday—Geology Halls.

Week beginning March 19: Monday—Ancient Burials; Tuesday—Man Through the Ages; Wednesday—Looms and Textiles; Thursday—General Tour; Friday—Chinese Art.

Week beginning March 26: Monday—Marine Life; Tuesday—Botany Halls; Wednesday—Primitive Musical Instruments; Thursday—General Tour; Friday—Amphibians and Reptiles.

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—257 herbarium specimens, Brazil and British Honduras; from Rev. Brother Elias—144 herbarium specimens, Colombia; from H. C. Benke—88 herbarium specimens, Illinois; from O. G. Moore—a specimen of Chittam wood, Alabama; from Wright-Hargreaves Mines, Ltd.—a specimen of gold ore, Ontario; from Donald C. Lowrie—3 snakes and a lizard, Tennessee; from Caribbean Biological Laboratories—6 small mammal skins with 5 skulls, Mississippi; from Chicago Zoological Society—an Asiatic starling; from Robert Zimmerman—jaws of a rare shark, Hawaii; from Professor Anastasio Alfaro—46 specimens of mosses, Costa Rica.

NEW MEMBERS

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

Associate Members

G. W. Baker, Niels Boberg, Lawrence A. Groot, Arthur J. Hayslett, James B. McCahey, Mrs. Phillip Miller, Harry Snyder.

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Zoology Storage Rooms Enlarged

The Museum's study collections of birds and mammals are now kept in a single large, light, and airy room, which has space for many additional storage cases. This room on the third floor was made by removing the walls from the corridor which separated the formerly overcrowded bird and mammal rooms. Overhead space has also been utilized by building new storage cases two feet higher. Twenty-four of these cases have been installed. The improvements have increased the storage capacity by about 75 per cent, and have augmented the utility of the reference collections.

A native-made model of a typical house of the Imerina tribe of Madagascar is on exhibition in Hall E.

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SAMBAR DEER, FAVORITE OF SPORTSMEN IN INDIA, SHOWN IN HABITAT GROUP

By WILFRED H. OSGOOD
Curator, Department of Zoology

In a hall of Asiatic mammals, especially one in which India is prominently represented, the sambar deer takes a place comparable to that of the white-tailed or Virginia deer in a hall of American mammals or the red deer in one devoted to European species. It is the common stag of its country, well known and beloved of sportsmen. Much hunting lore has grown up around it, and tales abound of its spirit and cunning.

Therefore, its place in William V. Kelley Hall (Hall 17) is an important one, now filled with a group of three animals for which Field Museum is indebted to the Kelley-Roosevelts Asiatic Expedition, and the late Colonel J. C. Faunthorpe.

Owing to its rather large size in comparison with other deer of India, the sambar is often called elk. However, although larger than the European red deer, it does not equal the so-called American elk or wapiti nor the true elk of the Old World which is similar to the American moose. It reaches a weight of some 700 pounds and its antlers often become heavy and rugose.

The sambar is a woodland or forest deer, a shy, retiring animal, largely nocturnal, and not particularly easy to sight by plain stalking or still-hunting. For these reasons, like the American whitetail, it holds its own in fairly populous regions. It is still found in Ceylon, in nearly all the hill districts of India, and it ranges northward up the Himalayas to 8,000 or 9,000 feet and even continues into western China. It also extends into Burma, Indo-China, and the Malay Peninsula. Many smaller varieties closely related to it inhabit the islands of the East Indies, including the Philippines. Its center of abundance, therefore, is southern rather than northern.

In comparison with other members of the deer family, the sambar has a number of peculiarities. Its antlers, although valued as trophies on account of their heavy, rugose beams and their fine symmetry, have the number of prongs reduced to three on each side. Six-point heads are the rule and only in very rare and exceptional cases is this number exceeded. Antlers over forty inches in length are considered large and records over fifty inches are not known.

The hair of the sambar is unusually coarse

and is lengthened on the neck into a sort of mane which can be erected when the animal is excited. The face glands or so-called tear-pits are large and reversible, that is, they can be turned inside out at will. The tail is quite long and bushy. The color is nearly uniform dark brown, and the young animals are like the adults without any suggestion of the light spots so characteristic of the young of many other deer. It has been said, also, that this deer is peculiar in shedding its horns with irregularity, but this is open to question. Eliminat-

ing abnormal or pathological cases, it is altogether probable that the sambar sheds and renews its horns at regular periods like other deer.

Perhaps the most common method of hunting the sambar is with beaters or organized parties of natives which drive the game toward the hunter, who stations himself where it is likely to pass. Even under these circumstances, crafty old stags often escape by breaking back through the line of beaters or by making some unexpected

move which baffles the waiting sportsman. In early days when the animals were very numerous, especially in Ceylon, they were hunted with dogs and when brought to bay were killed with a short spear. As related by Sir Samuel Baker, one of the most famous of English hunters, this was frequently very exciting. In one case, which almost passes belief, he tells of a stag which took its last stand on a huge rock overlooking a deep river gorge. After resisting the hounds to the limit, it finally turned and deliberately leaped to death in the rocky chasm.

The Museum's group shows a fine stag, a female, and a half-grown young one at a so-called salt-lick. Such places are fairly common in India and, as elsewhere, are

resorted to by various deer and antelope which are fond of the saline matter in the soil. These licks vary greatly, some having but little exudate and others being heavily impregnated. The group was prepared by Staff Taxidermists Julius Friesser and Arthur G. Rueckert, assisted by W. E. Eigsti. The background is by Staff Artist Charles A. Corwin from original studies made in India by artists especially employed for the purpose through the co-operation of the Bombay Society of Natural History.



The Sambar, Largest Deer of Southern Asia

Specimens in this group, just placed on exhibition in William V. Kelley Hall, were obtained by the Kelley-Roosevelts Expedition to Eastern Asia, and by the late Colonel J. C. Faunthorpe.

and is lengthened on the neck into a sort of mane which can be erected when the animal is excited. The face glands or so-called tear-pits are large and reversible, that is, they can be turned inside out at will. The tail is quite long and bushy. The color is nearly uniform dark brown, and the young animals are like the adults without any suggestion of the light spots so characteristic of the young of many other deer. It has been said, also, that this deer is peculiar in shedding its horns with irregularity, but this is open to question. Eliminat-

Bronzes Added to Chauncey Keep Hall

The exhibits illustrating the living races of mankind in Chauncey Keep Memorial Hall (Hall 3) have been augmented by the addition of four new life-size bronze busts and heads. The new types represented are an Alpine Austrian of Innsbruck, a Zulu woman of Africa, an Armenian, and a Korean man. These, like the seventy-seven previously on exhibition, are the work of the sculptor Malvina Hoffman, who spent

several years on a commission from the Museum, traveling all over the world and modeling from life representative types of all the principal races.

A few more sculptures for this collection remain to be completed, and Miss Hoffman is working on them at present.

An exhibit of commercial spices from all over the world is included among the economic botany collections (Hall 25).

Dr. Davidson Black Dead

The death on March 16 of Dr. Davidson Black, noted anatomist and anthropologist, at the age of 49, is a great loss to the scientific world. Dr. Black was professor of anatomy at the Peking Union Medical College. He was an authority on the "Peking man." In recognition of his eminent services to science and to Field Museum he had been elected a Corresponding Member of this institution in 1932.

Field Museum of Natural History

Founded by Marshall Field, 1893
Roosevelt Road and Lake Michigan, Chicago

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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, 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.

A COLONY OF WATER-DEER

By ELMER S. RIGGS

Associate Curator of Paleontology

In Ernest R. Graham Hall (Hall 38) may be seen a slab of clay-stone in which are embedded the skeletons of twenty-five little water-deer, *Leptomeryx*. This specimen was found by Museum collectors in the "bad lands" of South Dakota. The skeletons are preserved just as they were found and in the original stone.

The slab containing all of these twenty-five skeletons is only four by six feet in size. They were entirely buried and covered in the layer of clay-stone when found in the bad lands. Little rivulets which ran down the hillside, cutting furrows through the softer layers of clay, had broken through the harder layer and destroyed part of the buried skeletons and left the bones of others exposed in the broken ledge.

The part of the ledge containing the skeletons was taken out in blocks and so shipped to the Museum. There the parts were then rejoined in one irregular slab. The stone of the upper surface was then removed with infinite care and patience, and each little bone was thus laid bare. Some of the skeletons are disarticulated and the bones mingled together. Others are well joined and can be traced as almost complete skeletons.

Leptomeryx was a gregarious animal which, from available evidence, lived in herds and roamed about the Black Hills and out over the adjacent plains. It fed upon grass and lived much as a modern antelope lives. It was no larger than a Persian cat or a jack-rabbit, and was more nearly related to camels and llamas than to the true deer of modern times. It had no antlers or other weapon of defense, apparently relying upon fleet-footedness to outdistance its enemies.

How these twenty-five skeletons and others which must have been destroyed by the process of erosion, came to be buried together is a matter of conjecture. Some analogy may be found in the habits of llamas and vicunas of South America in herding together in large numbers in the winter season. A similar habit is observed among domestic sheep, deer, antelope and other animals which live in large herds. In winter many die of cold and leave their skeletons to accumulate on the bedding ground. Or, they may have been buried in heavy snows and covered over by freshets in the spring which perhaps took them unaware.

SULKAS MASKS

By ALBERT B. LEWIS

Assistant Curator of Melanesian Ethnology

While belief in some sort of supernatural beings is almost universal, the ways in which these beings are supposed to make themselves known to their followers vary greatly. In many parts of Melanesia they are thought to take a material form, and so appear to their believers, often making a visit of several days' duration, spending most of the time in the sacred house or temple in the village or in some secret place in the forest near-by, appearing to the villagers at certain times with formalities and special ceremonies.

The times for such visits are either determined by custom, or arranged for special occasions by the old men having such matters in charge. The form taken by the embodied spirit is fixed by habit and tradition, and, while details may vary, the general type is quite characteristic for each region. Usually the spirit is represented by

a man with his body, except the feet, concealed by fiber or leaves, and bearing over his head a more or less elaborate mask structure.

A number of different masks, representing several types, are exhibited in Joseph N. Field Hall (Hall A). One of the most elaborate occupies a case in the center. This was made by the Sulka, a people living in southeastern New Britain. It is shaped like a huge umbrella, with a nearly flat top, supported on a cone-shaped structure covering the head of the bearer, and with a representation of a large insect (mantis) in front.

The materials used and the method of construction are the same for all Sulka masks, and in this respect they differ from all others. The frame is made of light, stiff sticks, with coils and splints of rattan, all tied together with fine rattan strips to form a definite body, over which is placed a layer of pith, tied or sewed on with the fiber obtained from the aerial roots of the pandanus. The upper surface of the umbrella, however, is covered with the fine tissue-like leaf sheaths of the coconut, to which numerous feathers are attached. The under side of the umbrella is covered with flat strips of pith cut out of a sort of reed. The somewhat ridged surface of the remainder of the mask is covered with pith out of sections of a kind of vine, beaten to flatten and soften them, and tied on with pandanus fiber.

This work is very slow and occupies many months, sometimes a year or more. It is carried on in a secret place in the forest, known only to the initiated, so that all others regard the masked figure when it appears as supernatural. The painting is not done till the very last, as the vegetable dyes used for red and green fade rapidly in bright sunlight.

After the spirits have returned to their own abode, the masks are usually destroyed, but may be left for some time in the sacred houses, or even sold, provided they can be removed without the uninitiated seeing them.

LAPIS LAZULI

One of the largest masses of lapis lazuli known, a block two feet long, twelve inches wide and eight inches thick, now occupies an individual exhibition case in Hall 34 of the Department of Geology.

Lapis lazuli, a bright blue opaque mineral or, more accurately, mixture of minerals, has been used from time immemorial as an ornamental stone. It was the sapphire of the Greeks and Romans, and the Hebrew Scriptures. Large quantities are found in early Egyptian tombs and the Chinese have long held it in high esteem. Marco Polo in A.D. 1271 visited mines where it was found.

The blue pigment called ultramarine blue originally was pulverized lapis lazuli, but an artificial ultramarine, more cheaply made and of equal quality, has now replaced the natural pigment. Lapis lazuli was once used also as a medicine for treating various disorders.

Today lapis lazuli is still carved into vases, small dishes, brooches, beads and ring stones, and is employed in mosaic work. It is found in only a few places. That of the highest repute comes from Afghanistan near the Oxus River. It is also found near Lake Baikal in Siberia, and in the Andes of Chile. The large specimen in Field Museum was obtained from an Inca grave in Peru. The Incas probably obtained it from the Chilean locality.

NEW EXHIBITS ILLUSTRATE PHYSICAL ANTHROPOLOGY

A series of exhibits illustrating various phases of race biology or physical anthropology is being added to Chauncey Keep Memorial Hall (Hall 3, the main sections of which contain the "Races of Mankind" bronzes by Malvina Hoffman). The first five cases of this series have now been completed and installed in the hall.

One of the new exhibits shows the various criteria employed by anthropologists to compare and distinguish racial characteristics. Examples of round-headed and long-headed skulls are included in it, together with a map indicating the distribution of types of head form. Charts show cranial forms, age changes, and racial differences in skulls, differences in the outlines and proportions of the body due to race and sex, variations in the shape of eyes, nose, chin and lips, and age changes in teeth. Distribution of races according to skin color and types of hair is shown on maps. Samples of hair from the various groups, several types of ears, and the disarticulated skeleton of a new-born child complete the contents of the case.

In another case, casts made from living subjects, accompanied by photographs, illustrate differences in hands and feet among various peoples, due to specialized uses. A graphic portrayal of the main divisions of the human race is presented in another case by means of thirty-seven photographs of the more important types, arranged geographically, with their suggested basic relationships indicated. Skulls of a number of these types are also exhibited.

A fourth case is devoted to the methods of head and body deformation practised by many peoples. These include scarification, tattooing, binding of feet, artificial deforming of skulls, filing of teeth, piercing of noses with such things as bone pins, stretching of the neck by encircling it with metal rings placed one above the other, increasing the size of the lips by the insertion of wooden disks, and other acts to produce a grotesque appearance.

In the fifth case is a series of endocranial casts of brains of monkeys, apes, other animals, and various modern peoples. These are accompanied by drawings illustrating the location of the brain, the areas associated with the various functions, racial types of skulls, and the position of the bones inside the body. The operation of trepanning, as practised by various peoples over thousands of years, is illustrated by skulls showing the hole in the skull bone. The piece of bone thus removed was often worn as an amulet by prehistoric peoples.

THE PANAMA HAT PALM

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

The plant known as the Panama hat palm (*Carludovica palmata*) is native to Central America and northern South America, particularly Ecuador and certain parts of Peru. The latter are the centers of production of the well-known hats commonly but erroneously attributed to Panama, by way of which they found their way into commerce.

The manner in which the young, still unexpanded leaves of the plant are made to furnish the fiber-like splints used for the plaiting of these hats and a variety of other articles, was described briefly in FIELD MUSEUM NEWS of June, 1933, in connection with a note on the hat-making materials of vegetable origin exhibited in Hall 28.

The steps in the production of a Panama hat are illustrated in that exhibit.

A reproduction of an entire plant of this so-called "palm" has recently been completed in the Plant Reproduction Laboratories of the Department of Botany. It has been installed in the Hall of Plant Life (Hall 29) in close proximity to the aroids, or calla lily family, and near the palms, in accordance with its apparent relationship to both of these groups of plants.

In general appearance the plant is a stemless, low-growing fan-palm, with split fan-shaped leaves borne on smooth slender cylindrical leaf stems, giving it an aspect graceful and ornamental enough to make it a favorite horticultural object in tropical and subtropical gardens. Its flowering and fruiting spikes are, however, more suggestive of the aroids than of the palms, and the resemblance to the former is even more striking in certain other members of the rather small family (Cyclanthaceae) to which it belongs. Many of the Cyclanthaceae are



Origin of Hat Material

Reproduction of the Panama hat palm, on exhibition in the Hall of Plant Life.

vines or climbers, like the aroids, and some have leaves much less suggestive of palms.

The flower spike of the Panama hat palm, plainly seen in the accompanying photograph, presents an unusual feature in the mass of enormously elongated sterile stamens, resembling the "silk" of corn.

The lifelike and accurate reproduction of this plant, executed largely in celluloid and glass, furnishes an interesting addition to the exhibits of the Department of Botany. The plant material and studies on which it is based were obtained by the Stanley Field Guiana Expedition of 1922, which has furnished such a large share of the exhibition material of the Department of Botany.

Prehistoric Crutches from Utah

In Hall 7 is an exhibit of material from the prehistoric cliff houses of southeastern Utah. Especially interesting is a pair of crutches fashioned from forked willow limbs. The crosspieces are neatly cushioned with yucca fibers and buckskin. Noteworthy also are a cane made of cottonwood, and a large wooden ladle. These objects date from about A.D. 1100 to 1200.

Museum Open 9 to 5 in April

From April 1 to 30 visiting hours at Field Museum will be from 9 A.M. to 5 P.M. instead of 4:30. From May 1 to September 3 (Labor Day) the hours will be 9 A.M. to 6 P.M.

RARE MAMMALS COLLECTED BY MANDEL EXPEDITION

Specimens of two of America's rarest species of mammals have been received from the Leon Mandel Guatemalan Expedition of Field Museum. One of these rare creatures is the epaulet bat, which is strikingly different from all other species, according to Dr. Wilfred H. Osgood, Curator of Zoology. This bat has a white spot on each shoulder, and it is from this characteristic that it gets its generic name, *Centurio*, which refers to the title of a commander in the legions of ancient Rome whose rank was indicated by white epaulets. The epaulet bat has a bald head, extraordinary concentric rows of leaflike projections in the skin of its face, and double-lobed ears, all of which combine to give it the facial appearance of some supernatural being. There is a pouch in the skin under its throat. Although this species of bat was first discovered nearly one hundred years ago, less than a dozen specimens have ever been taken since.

The other rare animal obtained by the Mandel Expedition is a species of flying squirrel of which not more than two or three other specimens are known among the zoological collections of the world. It is somewhat similar to the small flying squirrel which is found in the southern United States. There is no record of this animal ever being taken anywhere between Texas and Guatemala, or farther south.

ANTHROPOLOGICAL EXPEDITION TO THE NEAR EAST

An anthropological expedition, sponsored by Marshall Field, has departed for the Near East to collect material and conduct researches for Field Museum. Henry Field, Assistant Curator of Physical Anthropology, is the leader. After brief stops in Egypt and Jerusalem for certain preliminary work, Mr. Field is to begin his first major operations at Bagdad. An anthropometric survey of the Kurd, Arab and Beduin populations of Iraq and Persia will be made. Local workers will be attached to the expedition as needed.

Studies may be made of other important racial groups such as the Yezidis and Chaldeans. From Bagdad the expedition will proceed to the region near Mosul, and thence to Rowanduz to study reported caves with prehistoric rock drawings and inscriptions. Thence it will proceed for further work at Tiflis, Teheran, and Rhages. In June a visit may be made to the Caucasus region for observations of the people now living there and to make several other special studies. Mr. Field plans to return to the Museum about the end of July or early in August.

Reinstallation of Minerals Completed

Changes in the installation of the mineral collection in Hall 34, in progress since the first of the year, are now complete. Save for installation of numerous new specimens, the changes are of a minor character, involving only the use of a new type of mineral support and label arrangement. The visibility of the minerals has been increased and the general appearance of the hall noticeably improved.

Exhibits of Value to Dentists

A party of delegates to the annual convention of the Chicago Dental Society, held last month, spent a morning in the Department of Geology at Field Museum studying the metallurgy of the metals used in their profession.

FOUR ILLUSTRATED LECTURES TO BE GIVEN IN APRIL

Four more of the spring course of illustrated lectures for adults remain to be given on Saturday afternoons during April. The lectures are presented in the James Simpson Theatre of the Museum, and all begin at 3 P.M. Following are the subjects, speakers and dates:

- April 7**—The Wonderland of Mexico
Major James C. Sawders, Nutley, New Jersey
- April 14**—Massa-Magaga: Head takers of Formosa
Captain Carl von Hoffman, New York City
- April 21**—The South Sea Islands
H. C. Ostrander, Jersey City, New Jersey
- April 28**—Krakatoa: An erupting submarine volcano recorded in motion and sound

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

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, four more remain to be given on Saturday mornings during April. 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. Following are the titles of the films to be shown on each date:

- April 7**—The Settlement of Jamestown
- April 14**—The Elephant and Its Child; The Romance of Life; Across the Seven Seas; Thrills of Lumbering
- April 21**—The Collision of the Icebergs; Hunting Whales; A Mother Bear Fights for Her Cub
- April 28**—Neighbors of Simba, the Lion; Plants That Trap Visitors; By the Blue Mediterranean

STATUETTE MADE OF "TIGER EYE" IS PRESENTED TO MUSEUM

A statuette, nine inches high, the gift of R. Bensabott, Incorporated, is an unusually attractive addition to the collection of semi-precious and ornamental stones in Hall 34. This figure is carved from a semi-precious stone called "tiger eye" by jewelers, and crocidolite by mineralogists. Its polished surface glows with a golden-yellow silky sheen characteristic only of this particular mineral. Its appearance is that of a stone compacted from a mass of lustrous yellow silk threads. This appearance is not wholly deceptive, but the threads are fibers of asbestos instead of silk.

The stone was originally a mass of dull, olive green asbestos fibers. These fibers have been changed from asbestos to quartz

by the natural processes responsible for the petrification of many fossils. During these processes the dull green of the asbestos has changed to brilliant yellow, and the fibers have been cemented into a compact stone. The dull lusterless surface of the asbestos has been replaced by the brilliancy of quartz, which is converted to a silky changeable sheen by reflections and refractions of light in the fibers.

The stone is called tiger eye by jewelers because when the stone is cabochon cut a streak of yellow light crosses the carved surface, resembling the yellow light which appears in the eye of the tiger and other members of the cat family. Tiger eye has long been a favorite for carving small ornaments, but its use for so large a figure as the one on exhibition is unusual.—H.W.N.

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.

TREES THAT BUILD LAND

Trees that actually build islands and create extensions of coasts are represented by an exhibit in the Hall of Plant Life (Hall 29). They are the mangroves, common seaside trees, which are found in profusion on shallow shores, bights and low islands of the American tropics and sub-tropics.

The mangrove is one of the few flowering plants which thrive in salt water, and it is known to be not only a retainer of land, but an active agent in its extension, botanists state. Its stems, together with numerous roots, supporting their branches, form tangled masses which afford lodgment for debris thrown up by the sea. On the west coast of southern Florida are extensive keys formed by mangroves on an original foundation of mud and oyster shells. In South America the whole Guiana coast, as well as the region about the mouth of the Amazon, is fringed by a mangrove forest, and in west Africa and various places in India such forests are common. Mangroves are, in fact, found along muddy coasts throughout the tropics.

The Museum exhibit shows a mangrove on a seashore, with branches overhanging the water. Floating seedlings dropped from these branches are seen in the water, as well as young mangrove plants which float about, get anchored in the mud, and give rise to new trees. It is around such clusters of mangroves as this that land is formed.

Included also in the Museum exhibit are cut sections of germinating seeds showing various stages in the development of the young plants, and specimens of mangrove wood, bark and flowers. The mangrove's method of multiplication is unique, inasmuch as the seedlings germinate on the parent tree, and it has therefore been described as "viviparous"—a term ordinarily applied only to animals.

Mangrove bark is rich in tannic acid and is sometimes used for tanning leather.

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 2: Monday—Life in the Far North; Tuesday—Interesting and Unusual Plants; Wednesday—Animals of Africa and Madagascar; Thursday—General Tour; Friday—Animal and Plant Life of Long Ago.

Week beginning April 9: Monday—Egyptian Exhibits; Tuesday—Armor, Shields and Weapons; Wednesday—Reptiles, Past and Present; Thursday—General Tour; Friday—South America.

Week beginning April 16: Monday—Plant Ecology; Tuesday—Native Philippine Life; Wednesday—Hall of Systematic Mammals; Thursday—General Tour; Friday—Crystals and Their Uses.

Week beginning April 23: Monday—Primitive African Peoples; Tuesday—Plants of Economic Value; Wednesday—Spring Birds of the Chicago Region; Thursday—General Tour; Friday—Moon and Meteorites.

Monday, April 30—Chinese Exhibits.

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. Dagny Carter—4 fragments of Chou pottery and a crupper of damasked iron, China; from Mrs. Joseph Birren—7 ethnological specimens, Illinois, Australia, South Sea Islands, and Spain; from Dr. A. E. Douglass and Harry T. Getty—polished cross sections of logs from various dated ruins, charts, photographs, and a boring tool (32 objects), Arizona and New Mexico; from Grace Brewster Cross—5 ethnological and 2 geological specimens, Hawaii; from William A. Schipp—60 herbarium specimens, British Honduras; from Alexander E. Lawrence—452 specimens of plants, Colombia; from James Zetek—16 herbarium specimens, Canal Zone; from Museo Nacional—68 herbarium specimens, Costa Rica; from R. Bensabott, Incorporated—a carved figure of tiger eye, Illinois; from Wayne Clark—4 specimens concentric bleaching in shale, Utah; from Chicago Zoological Society—a brocket deer, Guatemala; from Dr. G. W. D. Hamlett—23 bats, Brazil; from Lincoln Park Zoo—a griffon vulture and a turaco, Africa; from M. D. Pirnie—2 specimens of American goldeneye and an American merganser, Michigan.

NEW MEMBERS

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

Associate Members

William E. Dickey, R. C. Hyatt, Conrad J. Kalbfell, Mrs. Ewald H. Siebel.

Annual Members

Edward T. Camenisch, Charles T. Clark, Mrs. Joseph H. Defrees, E. J. Flood, Mrs. Edwin S. Ford, Dr. Charles E. Galloway, Jacob Greenhouse, John T. Hillyer, Mrs. Thomas J. Houston, A. T. Kates, W. E. Langrill, Mrs. Roscoe G. Leland, George Edward Leonard, Paulus List, Miss Edith Luther, R. B. McCreight, W. B. McKinstry, Miss Zipporah Herriek Pottenger, Lawrence Rayner, Mrs. Harry A. Riley, M. J. Rosenfeld, Allen Benjamin Roth, Lester N. Selig, Mrs. Anita Simpson, Mrs. W. W. K. Sparrow, Walter H. Strom, Alfred C. Tyler, Mrs. Frederick T. West.

Pomo Indian Basketry

The Pomo Indians of north central California were probably the most expert basket makers in North America. Perhaps the one striking characteristic of their baskets is the use of feathers to form colors and designs. The feathers most commonly used were taken from the California woodpecker, California quail, and breast feathers from the meadow larks and orioles. Many remarkable examples of Pomo basketry may be seen in Hall 6.

Field Museum News

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SWAMP DEER OR BARASINGHA OF INDIA SHOWN AMID SCENE OF ITS HOMELAND

BY WILFRED H. OSGOOD
Curator, Department of Zoology

A fitting companion piece for the group of sambar deer recently completed is a group of swamp deer finished and opened to the public a short time later in William V. Kelley Hall (Hall 17). The two groups occupy adjoining space, making comparison easy and emphasizing the contrast both in the appearance and the habits of the two largest species of Indian deer.

The swamp deer is somewhat smaller than the sambar and has different habits. Although the two are sometimes found in close proximity, the swamp deer is practically confined to plains, swamps, and light open woods, whereas the sambar prefers the deep forest.

The name swamp deer is not wholly appropriate, since the species does not always live in swamps nor even on wet ground. Along the rivers of northern India, Assam, and parts of Bengal where swamps are numerous, it constantly resorts to them and is so water-loving it splashes belly-deep for hours at a time feeding on waterplants and enjoying relative safety from such enemies as tigers and leopards. In the Central Provinces, however, the climate is much drier, with no swamps worthy of the name, and here it is an upland animal, although still very partial to long grass. Hunters, seeing it only in this region, therefore, are at a loss to account for the name swamp deer. Among natives, it is usually called barasingha, which means twelve-pointed in reference to its antlers which normally have six points on each side when fully developed. For general use this name is objectionable and confusing because it is also applied to the Hangul or Kashmir stag of northwestern India, a very different species.

The swamp deer is practically confined to central and northern India. It does not

extend southward beyond the Central Provinces or east of the Bay of Bengal, and it does not occur in Ceylon. Its nearest relatives are the rare (perhaps extinct) Schomburck's deer and the thameng or Eld's deer of Burma, Siam and Indo-China. Fine stags may reach a weight of more than 500 pounds. The antlers, which are characterized by a long brow tine at right-angles to the beam, seldom exceed 40 inches in length, and those of 36 inches are regarded as fine trophies.



Habitat Group of Indian Swamp Deer

The James Simpson-Roosevelts Asiatic Expedition collected all but one of the animals in this new exhibit. The late Colonel J. C. Faunthorpe obtained the other specimen for the Museum.

The swamp deer is plainly colored, varying from light tan to fairly dark brown according to season. The young are spotted with white, and a row of spots on each side of the dorsal line frequently persists in the adults. The species is highly gregarious and polygamous. As in the red deer and others of the so-called typical deer, the older stags gather groups of the females or "hinds" in the fall of the year and fight with each other over their possession. At other seasons, females and young animals of both sexes herd together much of the time and, although the larger herds of former times are no longer seen, it is still possible to see some forty or fifty scattered about in the grass of a single meadow.

Hunting the swamp deer is usually by stalking and it is often done on horseback or with elephants, the last being required especially in the deep swamps where the hunter can see only a few feet except from an elevation. In the uplands a curious piece of hunting accoutrement is sometimes used where the grass is very long. This is a small bamboo stepladder which is carried by the shikari and set up from time to time for the sportsmen to ascend in order to locate the game.

One of the animals in the Museum's group was obtained by the late Colonel J. C. Faunthorpe, and the others by the James Simpson-Roosevelts Asiatic Expedition of 1926. This expedition was enabled, through the courtesy of resident sportsmen and officials, to make a short hunt in India after finishing its work in the Pamirs and Himalayas. Mrs. Theodore Roosevelt and Mrs. Kermit Roosevelt, who had joined their husbands at this time for their return voyage, were included in this final brief trip and took an active part. In consequence, one of the swamp deer in the Museum group fell to the rifle of Mrs.

Theodore Roosevelt, and one to that of Mrs. Kermit Roosevelt.

The group was produced by Staff Taxidermists Julius Friesser and Arthur G. Rueckert, assisted by W. E. Eigsti. The background was painted by Staff Artist Charles A. Corwin, from field studies furnished by the Bombay Natural History Society.

By an unfortunate error in the article on the other new group of Indian deer—the sambar—which appeared in the April issue of FIELD MUSEUM NEWS, the collecting of specimens in that group was attributed to the William V. Kelley-Roosevelts Expedition to Eastern Asia. The specimens should have been credited to the James Simpson-Roosevelts Asiatic Expedition.

TOYS IN ESKIMO COLLECTION

BY PAUL S. MARTIN
Assistant Curator of North American Archaeology

Field Museum recently acquired by exchange with the National Museum in Copenhagen, Denmark, an excellent collection of archaeological and ethnological items collected among the Eskimo of Greenland. The specimens clearly reflect the daily life of these northern people. The fur clothing is sensibly conceived to protect the wearer from the extreme cold. While conforming to a definite pattern, it does not stress style

and fashion at the expense of physical comfort. Waterproofed skin coats, trousers, and boots are worn by the men when hunting in their kayaks or skin boats.

Judging from the number of toys in this collection, Eskimo children like to play with make-believe things as much as do white children. Interesting, too, is the fact that a greater variety of toys is found among the Eskimo than among Indian tribes. For example, one finds toy sleds, stone lamps, stone bowls, arrows, harpoons, tops, seals, ducks, and kayaks. Eskimo children seem

especially fond of dolls which are carved from wood, ivory, or stone, and which are sometimes provided with tiny fur garments.

Petrified Redwood

On exhibition in Ernest R. Graham Hall (Hall 38) is a petrified log of redwood, ten feet in length. This is all that can be exhibited in one case. The whole tree is thirty-seven feet long. The heart is silicified, the sapwood has changed to coal, and much of it has crumbled away. The tree is from Alberta, Canada, and of the Cretaceous age.

Field Museum of Natural History

Founded by Marshall Field, 1893
Roosevelt Road and Lake Michigan, Chicago

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FIELD MUSEUM NEWS

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

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WILFRED H. OSGOODCurator of Zoology
H. B. HARTEManaging Editor

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, 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 luncheon.

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.

BUSHMAN HUNTERS

BY WILFRID D. HAMBLY

Assistant Curator of African Ethnology

In the Kalahari desert of South Africa live several tribes of Bushmen having similar languages, appearance, and hunting culture. They belong to Negroid stock, but at some unknown remote time they branched off and formed a new type. Bushmen are on the average several inches taller than Pygmies, and apart from the general resemblance of hunting cultures among Pygmies and Bushmen, very little ground for comparison remains.

The Bushmen have a peculiar click language, and a word may have several distinct meanings according to its utterance on a high, middle, low, rising, or falling tone. The vocabulary is meager except in reference to hunting and associated animals and objects.

Agriculture is not practised, but vegetable produce is collected from the veld by women who are provided with pointed digging sticks. An example of the stone weight used at the upper end of the stick is shown in a case in Hall D. Here several articles presented by Arthur S. Vernay, of New York and London, are exhibited; they were collected by the Vernay-Lang Kalahari Expedition (1930).

The collection includes bows and poisoned arrows, beads made of ostrich eggshell, tobacco pipes of soapstone (steatite), and several ostrich eggshells engraved with simple geometric designs. Apart from the rock paintings and engravings made by Bushmen, which are famous for their realism in portraying animal life, the arts and handicrafts of these people are poorly developed. In disguising themselves, in the making of traps, and in the finding of water in apparently waterless country, the hunters excel. Yet their lives are simple. Huts are only temporary shelters, magic and religious beliefs are of an elementary kind, and social organization is simple. Within the memory of persons now living the Bushmen were making arrowheads of stone, and their simple hunting culture is comparable to that of stone-age man in Europe, 50,000 years ago.

PREHISTORIC PLANTS RESTORED

Restorations of the curious prehistoric plants known as "seed ferns" or "cycad ferns," which flourished about the time the first four-footed animals were beginning to appear on earth, or about 250,000,000 years ago, are on exhibition in the Hall of Plant Life (Hall 29).

Remains of these plants, although long known to geologists and paleobotanists in the form of fragments of what appear to be fern fronds, have only in recent years come to be well understood, according to Dr. B. E. Dahlgren, Acting Curator of Botany. Previously their several component parts were considered to represent forms of separate plants. In the same rock beds in which the fern-like fronds are preserved are found a variety of other plant material of the same age, consisting of fossil foliage, cones, branches, stems, and seeds. The seeds range in size from apple seeds to peach kernels, and some bear a close resemblance to those of cycads. That any of these could have any possible relation to the fern-like fronds was not at first even suspected, for modern ferns, as is well known, bear no seeds.

Recent paleobotanical discoveries in England and Germany, and most recently in China, have demonstrated beyond doubt, however, that these fern-like fronds are fragments of plants of the general aspect of tree ferns, and specimens have been found

with the seeds attached. Thus the stems, foliage and seeds, formerly considered to represent parts of distinct kinds of plants, have proved to be definitely associated, and it has been possible at the Museum to reconstruct with confidence these strange plants of a past era as research in connection with their fossils now indicates they must have appeared when alive.

The restorations were made in the Plant Reproduction Laboratories under the direction of Dr. Dahlgren and Professor A. C. Noé, paleobotanist of the University of Chicago, and Research Associate in Paleobotany at the Museum. Some of the fossil specimens used as guides in the Museum reconstruction work were unearthed at Mazon Creek, Illinois.

PLESIOSAUR SWALLOWED STONES TO GRIND ITS FOOD

BY ELMER S. RIGGS

Associate Curator of Paleontology

A specimen of a fossil swimming lizard, or plesiosaur, in Ernest R. Graham Hall (Hall 38), shows an interesting food habit. The specimen, belonging to the genus *Elasmosaurus*, was collected by a Museum expedition from a Cretaceous formation in southeastern Montana. Bones of the shoulders, breast and hips were found buried in a dark shale only a foot or two below the surface. Various bones had been washed out by rains and were scattered on the surface.

Lying beside the shoulder blades and the large flat bones of the breast, and partly indented in them, were found 206 granite pebbles varying from the size of a walnut to that of a golf ball. Most of them were smooth and rounded like pebbles polished by a running stream, but some show angles not worn away. No other stones were to be found in this fine-grained shale in which the specimen lay. It is known that common barnyard fowls swallow small pebbles in a similar way and many of them are usually found in the gizzard of a chicken or turkey. Crocodiles and various other modern reptiles are also known to aid the digestion of their food in this way. It seems only reasonable therefore to assume that these ancient reptiles had a similar habit.

Plesiosaurs of this and other kinds lived in the inland seas which flowed over large areas between what is now the Mississippi River and the base of the Rocky Mountains. Some specimens found in the old sea bottoms of Kansas had in their stomachs stones which are known to be found only at the northern boundary of Iowa. This observation shows that these ancient swimmers, which lived one hundred million years ago, traveled far in search of their food and the pebbles with which to grind it.

Director's Report Out Soon

Copies of the Annual Report of the Director of Field Museum to the Board of Trustees for 1933 will be distributed to all Members of the Museum at an early date. The book is being printed by Field Museum Press. It contains 136 pages and twelve photogravure plates. In it the activities of the Museum during the year are reviewed in detail by Director Stephen C. Simms.

Meteorite Collection Grows

Six meteorites have been added to the meteorite collection in Hall 34 since the beginning of the year. The collection, which is the largest in the world, now contains specimens of more than two-thirds of all known meteorites, or 723 of the 1,046 of which there is a record.

MUSEUM'S BIRD GROUPS SHOWN IN 'THREE-DIMENSION PICTURES'

The habitat groups of birds exhibited in Hall 20 of the Museum have been reproduced in "three-dimensional pictures" in a new book, *The Bird Kingdom*, which will go on sale during the first week of May. This book is a companion volume to *The Animal Kingdom*, published a few months ago, containing the same sort of illustrations depicting Field Museum's habitat groups of American, Asiatic, and African mammals.

Each copy of these books is accompanied by an optical device known as the "Orthoscope," and the pictures are printed by a special process which makes them appear, when viewed through this device, as though they were in three dimensions like the groups which they depict. The birds and animals stand out vividly from the background and seem to come to life. They and the objects that surround them are brought into high relief just as they might be seen in nature.

Both adults and children will find these pictures fascinating and interesting.

Included among the groups pictured in *The Bird Kingdom* are such widely varied species as the northern loon, golden eagle, California condor, whooping crane, wild turkey, white pelican, ruffed grouse, flamingo, jabiru stork, horned screamer, scarlet ibis, Alaskan water birds, albatrosses and other mid-Pacific birds. Opposite the three-dimensional pictures are black-and-white illustrations, with key-numbers for identification, where necessary. An informative text accompanies each group.

The book is 9 by 11 inches in size, and bound in dupont leather. The Orthovis Company of Chicago is the publisher. Copies will be on sale at the Museum at \$2.00 each, plus 15 cents for postage if ordered by mail.

Representations of bacteria as seen through a microscope may be inspected in the Hall of Plant Life.

AN ETHNOLOGICAL COLLECTION FROM PACIFIC ISLANDS

A collection of 835 ethnological specimens from the Pacific islands of the Melanesian and Polynesian groups has been presented to the Museum by Templeton Crocker of San Francisco. The collection is of high value, and will be a most desirable supplement to the material the Museum previously possessed from these regions, notably the exhibits in Joseph N. Field Hall (Hall A), and Hall F.

In recognition of this generous gift, Mr. Crocker has been elected to the class of Museum membership designated as Contributors.

Summer Schedule Begins

The summer schedule of visiting hours begins at the Museum on May 1. From that date until Labor Day (September 3) visitors will be admitted between the hours of 9 A.M. and 6 P.M.

A LARGE JAPANESE SILK TAPESTRY, NOTABLE FOR ITS ART AND HISTORIC SIGNIFICANCE



A Masterpiece of Artistic Weaving

Several hundred men worked for four years in making this unique tapestry. Field Museum, unfortunately no longer able to exhibit it, will consider offers from other institutions or private collectors for its sale or exchange.

This huge unique tapestry, measuring 22 by 13 feet, was made in Kyoto, Japan, for the World's Columbian Exposition of 1893, at the close of which it was purchased by Field Museum. Entirely hand made, several hundred men were engaged for four years in its production. The amount of labor spent on it may be gauged from the fact that the weaving of a single face represents a man's work for from three to ten days. Almost seven hundred different colors were used, and a hundred experiments were made with coloring the portal and the large tree.

The subject represented in this woven picture is the consecration of the celebrated temple in Nikko dedicated to the memory

of Prince Ieyasu, one of the prominent figures in Japan's history, who broke the power of the feudal lords and established himself as generalissimo (shogun) of the empire. His memorial temple was completed in 1635, and its consecration was celebrated on a grand scale with solemn ceremonies. Fifteen hundred men participated in the procession to the temple, and this procession is depicted in the tapestry. The main features of the festival are two portable shrines each carried by a hundred men. The wood carvings of the temple are exactly reproduced with their original designs and colors. The costumes likewise are represented with fidelity, making this tapestry not merely one

of artistic quality, but also an accurate document of historical value. The structure occupying the center is the Yomeimon, which is a gateway in front of the main building that contains the life-size statue of Prince Ieyasu. The three buildings on the right enshrine the numerous temple treasures.

The constant expansion of the Museum's collections, and space requirements for new material, unfortunately render it necessary to withdraw this tapestry from exhibition. The Museum therefore desires to dispose of it to another institution or a private collector, either by way of exchange or cash transaction. Interested parties should communicate with the Director.

—B. L.

LEGUMES

Few things could be more commonplace or prosaic than peas, beans, and peanuts. But, as is illustrated in the botanical exhibits at Field Museum, they belong to a plant family which includes, besides many ornamental and economically useful plants, a host of species endowed with romantic, magical, mythological, and historical associations.

The legumes constitute one of the largest and most important families of flowering plants, according to Llewelyn Williams, Assistant Curator of Economic Botany. They include thousands of species, of which the most conspicuous characteristic is the fruit with its pod. Legumes range from small herbs to the largest forest trees. Sweet peas, cassias, mimosas, and acacias illustrate different types of their flowers. Temperate zones, tropics, and arctic regions all have legumes of one kind or another native to their soil. Products of the plants of the family include, besides various foods and fodders, structural timbers, cabinet woods, dyes, tans, gums, resins, fibers, drugs, cements, and ornaments.

Among species exhibited is St. John's bread, a Mediterranean legume, with a saccharine edible pulp which has been identified as the "hush" mentioned in the Parable of the Prodigal Son in the Bible. From Africa there are shown specimens of "overlook fruits" which, planted in a truck garden, will, in the belief of certain Negro tribes, magically protect the crops from plunderers.

Levity sometimes crops up in the names given to plants. The dry pods of a small tropical, umbrageous tree of the legume family make a tremendous clatter when a breeze blows, and have earned for the tree the name "woman's tongue."

The great sea bean of equatorial regions, largest of all beans, might well have come from the beanstalk of Jack the Giant Killer's giant. The sea beans attain a length of more than six feet, and they float thousands of miles, being found washed up on beaches in countries as far away as Norway from their place of origin. They have medicinal value. Almost as large as the scimitar pods of India and Java. Natives make snuff boxes, weights, and medicines from these pods. From the eastern Himalayas and Burma comes a long snakelike fruit, the gnu-theing, also possessed of medicinal qualities.

Curious are the fruits of the shingar tree of the tidal forests of Ceylon and Burma, which grow directly from the bark of the tree trunk. These fruits yield medicinal oil.

Several legumes produce seeds so nearly uniform in size and weight that they are used as standards of weight in the scales of Oriental jewelers and druggists. Among these are the crab's-eye, a legume which is deadly poison if injected under the skin, but harmless in the stomach; and the red sandal, used for making cement and medicines as well as for weights. Jewelers use other legumes for various purposes. The fob seeds of Venezuela are worked into watch fobs; Cuban ox-eye beans are used as a basis for gold inlaid work; the ornamental black and red necklace fruit of Java is made into necklaces and bracelets, as are the fruits of the coral tree of Jamaica.

To the tonka bean of Brazil milady owes certain perfume. The tamarind of Africa makes delicious drinks and preserves. Confections are made with the tragacanth of Asia Minor; mucilage from the gum Arabic of Africa. Innumerable tropical legumes furnish cabinet wood and building timbers.

One of the largest trees known is the algarrobo. Some trees of this species in Brazil are believed to have been alive for a thousand years.

TAXIDERMIC ART EXHIBIT

The International Exhibition of Taxidermic Art, sponsored by the technical section of the American Association of Museums, was on view at Field Museum from April 1 to 15. This exhibit, which has been shown in leading museums in New York, Washington, D.C., Pittsburgh, Buffalo, Cleveland, and Berlin, Germany, and is to be displayed later in various other principal cities, consists of 473 photographs of animal groups, mounts, and sculptures, and various series illustrating the steps in modern taxidermy methods. The work of eighty of the world's most highly skilled taxidermists on the staffs of institutions in the United States, Spain, Switzerland and Germany, is included.

Among the examples selected by the committee in charge are a good number of the animal groups and individual mounts in the collections of Field Museum. Staff taxidermists of this institution whose work is represented include Julius Friesser, C. J. Albrecht, Leon L. Walters, L. L. Pray, Ashley Hine, Arthur G. Rueckert, and Assistant Taxidermists John W. Moyer and Frank Lett. Also represented are the habitat backgrounds by the Museum's staff artist, Charles A. Corwin.

Gold of Forty-nine

Specimens of gold mined by James and Alexander Telfer during the great gold rush to California in 1849 have been presented to the Museum by William J. Chalmers. They may be seen in the mineral collection in Hall 34, the ore collection in Frederick J. V. Skiff Hall (Hall 37), and the placer gold collection in the Gem Room (H. N. Higginbotham Hall, Hall 31).

Books on Glass Presented to Library

A valuable addition to the Library is the two-volume work, by Eisen, *Glass: Origin, History, Chronology, Technic and Classification to the Sixteenth Century*, which has been presented by Fahim Kouchakji of New York. These books contain important information on a subject not easily traced. They are illustrated with many fine plates, including some which are beautifully colored.

Irish Author Visits Museum

Shane Leslie, noted Irish author who was lecturing in Chicago last month, was a visitor at Field Museum on April 18. He made a tour of the exhibits, accompanied by the Director. Mr. Leslie has been active in the Gaelic movement and the Oxford movement, and occupies a notable position in London literary circles. He was intensely interested in the Museum, especially the North American Indian and extinct bird collections.

Cacholong

The cacholong specimens among the opal collections in Hall 34 are examples of a mineral once esteemed as semi-precious but now almost forgotten. The name cacholong is very old, and is compounded of two Mongol words, khas, meaning jade, and sholong, meaning stone. The stone is dull white, looks like porcelain, and is so porous that it will adhere to the tongue.

Pike, pickerel and muskallonge are exhibited in Albert W. Harris Hall (Hall 18).

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 April 30: Monday—Chinese Exhibits; Tuesday—Story of Peat, Coal and Oil; Wednesday—Life in the South Seas; Thursday—General Tour; Friday—Animal Families.

Week beginning May 7: Monday—Jade and Pewter; Tuesday—Food Plants of the Western World; Wednesday—The Races of Mankind; Thursday—General Tour; Friday—Interesting Geological Exhibits.

Week beginning May 14: Monday—Valuable Fur-bearing Animals; Tuesday—Palms and Cereals; Wednesday—Skeletons, Past and Present; Thursday—General Tour; Friday—The Story of the Horse.

Week beginning May 21: Monday—Gems and Their Uses; Tuesday—Makers of Totem Poles; Wednesday—Men of the Stone Age; Thursday—General Tour; Friday—Unusual Plants.

Week beginning May 28: Monday—Animals of Plains and Deserts; Tuesday—American Archaeology; Wednesday—Memorial Day holiday, no tour; Thursday—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 American Friends of China—brush-holder of the emperor K'ien-lung, with inlaid inscriptions and designs in ivory, jade, and semi-precious stones, dated A.D. 1736, China; from Leon Mandel and Fred L. Mandel, Jr.—14 Lamaist paintings, 18th-19th century, Tibet and China; from T. Ito—Chinese wood engravings, illustrating agriculture and sericulture, Japanese edition of 1807 in two volumes, China-Japan; from Templeton Crocker—collection of ethnological material and photographs, Polynesia and Melanesia; from School of Forestry, Yale University—45 herbarium specimens, Colombia, Ecuador, and United States; from New York Coffee and Sugar Exchange, Inc.—9 samples of coffee standards, Brazil and Colombia; from Mrs. Ynes Mexia—34 herbarium specimens, Brazil; from A. E. Lawrance—9 herbarium specimens, Colombia; from Rev. Bro. Elias—82 herbarium specimens, Colombia; from Stanley Rezabek—a diamond, South Africa; from Embree Iron Company—37 lead and zinc ore specimens, Tennessee; from E. Mitchell Gunnell—a specimen of greenockite on fluorite, and one of millerite and calcite, Illinois and Missouri; from William J. Chalmers—15 specimens placer gold, California and Nevada; from Donald C. Peattie—2 beetles, Illinois; from John T. Pirie—an albino crow, Illinois; from John G. Shedd Aquarium—33 fish specimens; from Dr. Florentino Felippone—a free-tailed bat skin, Uruguay; from Robert Rafferty—a woodcock, Illinois.

NEW MEMBERS

The following persons were elected to membership in Field Museum during the period from March 16 to April 14:

Contributors

Templeton Crocker

Associate Members

Samuel B. Kraus, Miss Florence Mandel, Mrs. Oren E. Taft.

Annual Members

Dr. Amabel A. Anderson, Mrs. Gustavus Babson, Leonard H. Barter, William C. Binz, Joseph F. Brown, Mrs. Walter L. Cherry, Miss Virginia Chester, David R. Clarke, Dr. Edgar D. Coolidge, Mrs. G. O. Cuppaide, Paul E. Darrow, Mrs. E. E. Fies, A. F. Hooper, George C. Hunt, Stephen L. Ingersoll, A. R. Jones, Sr., Miss Susan E. Jones, Mrs. Marion Macdonald, Frank H. Marks, R. M. Ostrander, Miss Berulce E. Peters, Albert M. Quarles, Frank Rayner, Walter A. Scott, Walter C. Senne, Earl D. Speer.

Two-gallon Eggs

The shell of a hen's egg of average size holds two fluid ounces; the shell of an ostrich egg 45 ounces; the shell of the great fossil bird *Aepyornis* of New Zealand, exhibited in Ernest R. Graham Hall (Hall 38) has a capacity of 258 ounces, or more than two gallons.

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NEW GROUP SHOWS THE CURIOUS TERMITE-EATING AARDVARK AND ITS BURROW

BY WILFRED H. OSGOOD
Curator, Department of Zoology

Hoofed animals of the antelope family, which are so varied and abundant in Africa, have naturally furnished a majority of the subjects for the Museum's hall of African mammals (Carl E. Akeley Memorial Hall, Hall 22). A recent addition, however, provides something quite different and something of very unusual character. This is a group of aardvarks, specimens for which were obtained in 1929 by the White-Coats Abyssinian Expedition under the leadership of Captain Harold A. White and the late Major John Coats.

The aardvark is an animal difficult to define without resorting to technicalities. It is one of the most peculiar of living animals—extraordinary in appearance, structure and habits. The early Dutch colonists of South Africa called it aardvark (i.e. earth pig) on account of its appearance and habits, and this name has become established for it as anyone can learn by consulting the first page of the dictionary, where it has precedence over all other animals.

In spite of its pig-like snout and its smooth, fat body, it is quite unrelated to pigs. In fact, it has been something of a puzzle to zoologists and anatomists who have undertaken to find a logical place for it in schemes of classification. Although conceded to be abnormal, it was long included among the edentates such as anteaters, pangolins, sloths, and armadillos, but increased knowledge indicates that its resemblances to these animals are mainly superficial, so it is now placed in an order by itself. This order is called Tubulidentata, in reference to the peculiar tubular structure of its teeth which, the microscope reveals, are different from those of all other mammals. It has even been suggested that these teeth resemble those of certain fishes, and at least it is evident that the animal's immediate ancestry has been along lines somewhat different from those of other mammals of the present time. Remains of extinct species closely related to it have been found in certain parts of southern

Europe but their predecessors are unknown.

Aardvarks are common throughout much of southern and eastern Africa south of the equator. They live in relatively open, semi-arid country wherever there is an abundance of the termites or so-called

underground at an astonishing rate of speed and there are many accounts of failure to capture it by digging. Owing to its appearance above the surface only at night, it is seldom killed with firearms. It is also difficult to trap since its thick, heavy feet offer poor support for the jaws of a trap while its great strength permits it to free itself.

Messrs. White and Coats obtained their specimens by a combination of digging and shooting, and by shrewdly taking advantage of the fact that progress through the earth depends upon space behind for soil removed in front. They detailed part of their squad to press the earth down closely behind the struggling animal while others dug down vertically as near as possible to its position. When near enough to estimate its movements a rifle-shot was fired through the earth which disabled the animal and it was then hauled out.

The way this animal's powerful claws could tear open a termites' nest is easily imagined. One story has it that a preliminary thumping on the nest is performed with its tail to excite the insects and make them easier to lick up in quantities. Why the actual tearing of the nest shouldn't bring the same result is not explained.

The Museum's group shows two animals, one of which is just emerging from its burrow, while the other is standing near-by at the base of the deserted, spirelike termites' nest. The group was prepared by Staff Taxidermist C. J. Albrecht, who was a member of the White-Coats Expedition and participated in the capture of the animals.



The Aardvark

One of the world's strangest animals. The specimens in the Museum group were obtained by the Harold White-John Coats Abyssinian Expedition which had to dig as well as shoot to get them.

“white ants” upon which they feed almost exclusively. For this large heavy animal to subsist upon tiny termites is rather remarkable and testifies to the abundance of such food in Africa. Individual aardvarks may reach a weight of about 150 pounds and appear always to be fat and well-conditioned. Occasionally where they have been kept in captivity they have been induced to take rations of milk and chopped meat.

Although the aardvark is rarely seen, since it is shy and nocturnal, its large burrows are a familiar feature of the African landscape. Often they threaten the safety of the traveler on horseback who must thread his way among them at risk of bad falls for himself and his mount. As an excavator, the aardvark is probably unexcelled among animals approaching it in size. According to report, it can proceed

MUSEUM PARKING FACILITIES DURING WORLD'S FAIR

Facilities for parking of the automobiles of Field Museum visitors during the 1934 season of A Century of Progress have been arranged on the Museum grounds at the west entrance of the building. A nominal charge will be made for this service upon parking of cars.

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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BERTHOLD LAUFER.....	Curator of Anthropology
B. E. DAHLGREN.....	Acting Curator of Botany
HENRY W. NICHOLS.....	Acting 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:

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, 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.

MORE MEMBERS ARE NEEDED

As a result of the crucial period through which Field Museum, in common with other institutions, has been passing during the years of depression, the Museum, more than ever, needs the support of its Members in order to maintain, unimpaired, all the public services which it conducts, benefiting millions of people annually.

By your membership, you, the reader, have signified your appreciation of the value of the scientific and educational work carried on by this institution. For your support of its activities the Museum thanks you; and now takes the liberty of asking if you will help in another way.

The Museum must have additional Members. Many persons who would readily acknowledge the value of the cultural and civic benefits derived from this institution, and would gladly participate in supporting such activities, are unaware that opportunity is available for them to collaborate with the Museum in its work by means of membership. If each present Member would call to the attention of a friend or acquaintance the fact that this opportunity exists, pointing out also the privileges extended to Members, it is believed that a great increase in membership would result, and the Museum could proceed with its work less hampered by the financial stringency which depression-caused decline in income from endowment funds and other sources has thrust upon it. Will you help?

If you do not care to approach your friends on this subject personally, you can nonetheless render valuable assistance by sending to the Museum the names and addresses of any you think might be interested in membership if they knew about it. In soliciting them, your part in the matter will be kept strictly confidential—no mention will be made of your name by the Museum representatives unless you expressly suggest that your name should be used.

Field Museum has slightly more than 4,000 Members at this time. Certain comparable institutions in some other cities have two to three times as many. It is confidently believed that Chicagoans, if aware of this condition, would demonstrate that their civic pride is equal to that of the residents of any community, and that if they realized the needs of their Museum they would rally to its support in great numbers.

A handy card, upon which no postage is necessary, is enclosed with this issue of FIELD MUSEUM NEWS upon which you can write the names of any prospective Members you care to suggest. You need not sign your own name at all if you do not care to do so. Needless to say, your cooperation in this effort to enlist new Members will be deeply appreciated by the Board of Trustees of the Museum.

—STEPHEN C. SIMMS, Director

IMPORTANT MAYA DISCOVERIES MADE BY EXPEDITION

Important new discoveries in connection with the history and culture of the ancient Mayas have resulted from the excavations conducted by the joint archaeological expedition to British Honduras sponsored jointly by the Carnegie Institution of Washington, D.C., and Field Museum. Work was concluded last month, and J. Eric Thompson, Assistant Curator of Central and South American Archaeology, who was leader of the expedition, has returned to his post at Field Museum.

The ancient Mayas are credited with having established the most highly developed aboriginal civilization in America. The most important achievement of the Carnegie-Field Museum Expedition was the discovery of proof that the region of the Maya Old Empire, in and around San José, was never abandoned as had been believed previously. The former theory was that about eleven hundred years ago the population of early Maya cities for mysterious reasons migrated north into Yucatan. On this expedition Mr. Thompson found evidence that the city of San José was continuously occupied until about the fifteenth century. Depopulation of the region, therefore, may have been due to smallpox and other European diseases spread by the Spaniards in the neighboring territories of Yucatan and Guatemala.

Traces of five periods of occupation were discovered by Mr. Thompson at San José, indicating a stretch backwards to approximately the time of the birth of Christ or earlier. Associated with the last period, just prior to the discovery of America, are specimens of copper, the first ever to be found *in situ* in the region of the Maya Old Empire. Another find of great archaeological importance was a tiny fragment of cloth, smaller than a dime. It is the first cloth fragment to be excavated in the region, and apparently was preserved only by luck from destruction by the prevalent humidity of Central America.

Other finds include a unique ax, ten inches long, the blade and haft of which are made of a single block of obsidian; beautifully carved pottery vessels; a mirror made of a circular piece of iron pyrite; and fragments of imported wares which throw light on the thriving commerce that existed during the Maya Old Empire. The imports included marble wares from Spanish Honduras; obsidian from Guatemala; jade, presumably from southwest Mexico; and pottery apparently from areas as far as El Salvador and the Tampico-Veracruz region of eastern Mexico.

A large number of child burials was found, suggesting that the Mayas, like the Aztecs and the ancient inhabitants of the Andes as far south as Argentina, sacrificed children to ancient gods in the hope of being granted abundant rainfall. In one case Mr. Thompson found two children about eight years old buried together. In front of the neck of one was a beautiful head carved in jade. Since even chiefs at San José did not have jade in their graves, it seems obvious that an ordinary child would scarcely own such a treasured possession. The only explanation that appears to fit the facts is that the child was sacrificed as the representative of one of the gods, and for this reason wore the pendant of jade. Early Spanish writers state that the Mayas placed a higher value on jade than on gold.

Museum Honors Mrs. Sarah S. Straus

In recognition of her valuable services in sponsoring the Straus West African Expedition of Field Museum, which is at present conducting operations, Mrs. Sarah S. Straus, widow of the late Oscar Straus, of New York, has been elected by the Trustees of the Museum to the class of membership in the institution designated as Contributors. The expedition financed by Mrs. Straus, and which she herself accompanied in Africa for several months, is an important one. It is making zoological collections in Senegal, Nigeria and Angola.

THE RECENT DUST CLOUDS

BY HENRY W. NICHOLS

Acting Curator, Department of Geology

The haze of dust which was present in the air in and around Chicago during many days of the late spring and early summer was a minor demonstration of a phenomenon which, when present on a larger scale, is of geological importance. The wind-blown clays and soils exhibited in Hall 36 of the Museum are examples of the effects of such dust clouds.

In some parts of the world such dusts raised by the wind settle to the ground and form thick deposits called loess. In parts of the central United States the loess deposit is more than 100 feet thick, and there are places in China where its thickness exceeds 1,000 feet. The dust has often been transported for long distances and the great thickness is the result of a slow accumulation over long periods of time.

Loess is much like a slightly coherent clay or silt deposit of uniform texture and of a light buff or yellowish color. Its most noticeable feature is its ability, when cut by streams or other means, to stand with vertical walls.

There is another kind of loess, often indistinguishable from the wind-blown kind, which is the consequence of the settling of silt from muddy water.

EXPEDITION TO THE SOUTHWEST WILL RESUME OPERATIONS

For a brief season of four or five weeks, Field Museum will continue its archaeological excavations at the Lowry ruin in southwestern Colorado. This is the fourth season of the expedition. Dr. Paul S. Martin, Assistant Curator of North American Archaeology, leader in previous years, will again be in charge. He will leave Chicago by motor about June 18.

During the previous seasons of work, many important discoveries were made, including mural decorations in the ceremonial chambers, a type of masonry hitherto unknown in that part of the Southwest, significant mixtures of pottery types, and evidences of at least five different occupations of this particular location.

It will be impossible to excavate many new rooms this summer because of a shortage of funds, but it is hoped that light will be shed on some of the more puzzling features which remain to be explained about this prehistoric site and its early inhabitants.

GUARANA

BY B. E. DAHLGREN

Acting Curator, Department of Botany

One of the many interesting minor forest products of the Amazon is guaraná, a tropical climber long known to the South American Indians as the source of a pleasant beverage with the mildly stimulant properties of coffee. The plant is native in the forest of Amazonas especially between the rivers Tapajos and Madeira where it is also cultivated in various localities.

The accompanying illustration of a part of a guaraná vine, as reproduced for the Hall of Plant Life (Hall 29) of the Museum, serves to show the general appearance of the plant, its ribbed stems, large pinnate leaves, tendrils and bunches of bright red fruit. The plant (*Paullinia cupana*) belongs to the Sapindaceae or soap berries, a large tropical family abundantly represented on the American continent and—as a glance at the fruits would suggest, especially when they open, displaying their glossy black

seeds—not very remote from the horse chestnuts.

It is the hard smooth seeds, purplish or brownish black, the size of a hazelnut kernel, which are utilized. Gathered before they are completely ripe, they are freed by washing from their adherent pulpy white aril, dried and slightly roasted over a fire. They are then pulverized in a mortar and by the addition of some water made into a paste which is sufficiently plastic to be molded. Usually it is formed into the shape of sticks, the size of thick sticks of licorice and weighing half a pound, but the dried guaraná is also offered for sale shaped into the form of fruits, miniature animals or other familiar objects of the region. The dried paste becomes very hard and keeps well even in a moist climate. When wanted for use a small portion is scraped off. A natural grater commonly employed for the purpose is a rasp-like bone from the mouth of the pirarucú, the large red food fish of the Amazon.

Aside from its local use in Amazonas, guaraná, like kola, because of its caffeine content, which is greater than that of coffee,



Branch of Guarana

From the seeds of this plant a stimulating beverage is made. This reproduction is exhibited in the Hall of Plant Life.

serves for the production of a non-alcoholic carbonated drink, much esteemed in Brazil. Guaraná is little known in the United States, except in pharmacy for its stimulant, diuretic and alterative properties, but, like many other vegetable products listed in the Pharmacopoeia, it is rarely used. All of the relatively small crop, seldom exceeding a hundred thousand pounds, finds a ready sale, though only a fifth of it is exported.

The material for the reproduction of a guaraná vine in Hall 29, and related objects, including a pirarucú rasp, shown with the exhibit of beverage plants in Hall 25, were obtained by the Marshall Field Botanical Expedition to the Amazon in 1929.

Marble from Poland

Six polished marbles from Poland have been added to the marble collection in Frederick J. V. Skiff Hall (Hall 37).

Skeletons of man, gorilla, chimpanzee and orang are arranged for comparative study in the Department of Zoology.

MANDEL GUATEMALA EXPEDITION ACHIEVES NOTABLE SUCCESS

With the return late in April of Karl P. Schmidt, F. J. W. Schmidt, and Daniel Clark from Guatemala, it is gratifying to report the notable success of several of the projects of the Leon Mandel Guatemala Expedition. Emmet R. Blake, ornithologist of the expedition, was to remain in the field until June 1 to conclude studies on the distribution of Guatemalan birds.

The expedition obtained specimens and accessory material for exhibition groups of three of the most characteristic and interesting of Central American birds—the toucans, the giant oriole, and the quetzal. Two species of toucans, with their brilliant colors and grotesquely enlarged beaks, were found feeding in great flocks on fruit trees in the forest. The giant orioles drape whole trees with their woven hanging nests which are from three to six feet in length. Their colonies are a remarkable feature of the tropical landscape, and specimens of the nests as well as the birds were collected. Special permission was granted by President Jorge Ubico, of Guatemala, to collect the quetzal, which enjoys special protection as the national bird of Guatemala. This most brilliant of all the brilliant trogons was formerly so persecuted for its plumes that it has become one of the rarest of birds. Specimens were found in the cloud forest on the slopes of the Volcano Tajumulco in western Guatemala, and a small series was collected for the Museum's exhibit of this bird planned for the proposed Hall of Foreign Birds.

The scientific results of the expedition in the accumulation of representative collections from this rich territory are as valuable as the materials obtained for the exhibition halls. The collection of reptiles and amphibians will enable Assistant Curator Karl P. Schmidt to conclude his project for a comprehensive list of the Central American forms undertaken under the joint auspices of Field Museum and the John Simon Guggenheim Foundation.

Specialization on certain groups of small mammals, and the employment of a wide variety of methods of collecting, produced notable results, especially with bats and certain rodents. The collections of these mammals obtained by Mr. F. J. W. Schmidt include some of the rarest of Central American species as well as several forms hitherto unknown.

Guatemala is the meeting ground of the animal life of tropical America with that of temperate North America, which reaches the Guatemalan plateau. The zoological problems in the Guatemalan fauna are especially attractive on account of the wide variety of climatic conditions in that country, which include tropical rain forests, inland deserts, temperate plateaus covered with oak and pine forests, and mountain peaks which rise above timber line. Previous expeditions to Guatemala for Field Museum worked in limited areas. The larger personnel of the present expedition has made possible more comprehensive work in this exceptionally interesting territory.

Giant Fossil Sponges

Giant sponges, as much as three feet in length, may be seen in Ernest R. Graham Hall (Hall 38). In fossilizing they have turned to flint, but they are still recognizable as sponges.

Mexican archaeology is illustrated by a large collection in Hall 8.

A "FAMILY TREE" OF MAN AND THE APES

A "family tree" of man and other animals belonging to the same order, the Primates, has been placed on exhibition at the entrance to the Hall of the Stone Age of the Old World (Hall C).

On the background of the exhibition case is represented a branching tree, and attached to the branches are reconstructions of the skulls of primitive monkeys and apes, of types of prehistoric men, and finally skulls of modern men of various races, and modern apes. The exhibit graphically demonstrates the theory that man, while not the descendant of any living type of ape, had, from many lines of evidence accepted by scientists, a common ancestry with the apes; and that while apes were evolving from primitive types to those living today, a parallel evolution was taking place through various primitive human types and culminating in present races of man.

The exhibit begins with reconstructions of the skulls of a primitive lemur, a tarsier, an ancestor of the anthropoid ape, a hypothetical intermediate type between the apes and man, and an anthropoid ape. Emanating from the same original sources, but taking separate lines, are found branches with reconstructions of the most famous types of prehistoric men of which scientists have found evidence—the Trinil or Java Man (*Pithecanthropus*), the Piltdown Man (*Eoanthropus*), the Peking Man (*Sinanthropus*), Heidelberg man, Neanderthal man, and Cro-Magnon man. Other branches indicate the relationship to these and to each other of the four principal racial types existing today—the Australian, the Negro, the Mongolian and the White, of each of which a skull is displayed. Likewise, from the lower branch is indicated the parallel development of the outstanding modern apes—gorilla, chimpanzee, orang, and gibbon. The exhibit performs the double function of indicating the relationships between the various branches of the primate order, and of providing material for studying the physical similarities and differences between the head structures of the various monkeys, apes, and men.

PLANTS COLLECTED IN 1778-88 RECEIVED AT MUSEUM

BY PAUL C. STANDLEY
Associate Curator of the Herbarium

A collection of plant specimens gathered while the Revolutionary War was in progress in the North American colonies has been added recently to the Herbarium of Field Museum. The collection was made not in North America, however, but in Peru, in 1778-88, by the first botanists who visited that country. They were Hipolito Ruiz and José Pavón, two men sent by the King of Spain to make a botanical survey of the country.

Some of the work of these men was performed under great hardships. A large part of their collections, after being assembled most laboriously, was destroyed by accident. After the two botanists returned to Spain they prepared a partial account of the plants. This was published in lavishly illustrated folios, of which there is a set in the Museum Library.

This valuable material, almost every specimen of which represents one of the new species given Latin names by Ruiz and Pavón, was received by Field Museum through exchange with the Botanic Garden of Madrid. Among the plants represented are several orchids, and numerous palms,

including the Panama hat palm, from whose leaf fiber the so-called Panama hats are manufactured. This plant, first discovered by Ruiz and Pavón, was named by them *Carludovica*, in honor of Carlos IV of Spain and Queen María Luisa, the royal patrons of the expedition to Peru.

It is a noteworthy fact that these pressed and dried herbarium specimens are in a perfect state of preservation, and in some of them the colors of the leaves are preserved as well as if they had been collected only a year ago.

The Museum's collection of Peruvian plants is probably the largest in the world. These newly acquired specimens of authentic material will be immediately useful in the preparation of the *Flora of Peru*, with which Assistant Curator J. Francis Macbride has been engaged for several years.

Rare Chinese Brush-holder

An unusually fine Chinese writing-brush holder was recently acquired with funds given to Field Museum by the American Friends of China. It was immediately placed on exhibition in a case illustrating writing materials in Hall 32. This brush-holder is carved from a rare Burmese tropical wood, known in trade as padouk. It is decorated with bamboo, rock, and a magpie perching on a plum tree, these designs being carved out of ivory, jade, rose quartz, chalcedony, carnelian, lapis lazuli, tiger-eye, spinel ruby, and mother-of-pearl. The magpie was sacred to the Manchu dynasty. An inscription carved in ivory means, "May you have white eyebrows (i.e. long life) and may your years be prolonged!" This is followed by the date "first year of K'ien-lung," corresponding to A.D. 1736, when the emperor K'ien-lung succeeded to the throne. The brush-holder was presented to him in commemoration of this event.—B.L.

Gift of Lamaist Paintings

An interesting collection of fourteen Lamaist paintings illustrating the Buddhist pantheon of Tibet, the largest in the world, was recently presented by Leon Mandel and Fred L. Mandel in memory of their deceased mother, Mrs. Blanche R. Mandel. These pictures are painted in bright watercolors on cotton cloth, and were executed by monks in the Lama monasteries. There are pictures of Buddha surrounded by a thousand imaginary or celestial Buddhas and of goddesses in the various forms of their numerous incarnations. Of especial interest is the portrait of one of the Dalai Lamas in his yellow and red priest's robe, holding a lotus in each hand.

A Camel from Wyoming

A slender, stilted skeleton from the hills of Wyoming, on exhibition in Ernest R. Graham Hall (Hall 38), tells the story of a family of animals once quite common in North America. The slender head, long neck, slender legs and spreading foot betray relationship to the camels and llamas.

This skeleton was collected from a sandstone formation of early Miocene age. Bones of these animals are fairly abundant as the animals must have been in the Great Plains region twenty million years ago.

This animal is taller and more slender than the llama of South America, but related to it. In fact the southern members of the family are known to have branched off a little after the skeleton of this individual was buried in the wind-blown sands of Wyoming.—E.S.R.

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:

Friday, June 1—Halls of Animal Life.

Week beginning June 4: Monday—Prehistoric Life; Tuesday—General Tour; Wednesday—North American Indians; Thursday—General Tour; Friday—Geology Exhibits.

Week beginning June 11: Monday—Primitive Peoples; Tuesday—General Tour; Wednesday—Egyptian Exhibits; Thursday—General Tour; Friday—Halls of Plant Life.

Week beginning June 18: Monday—Moon and Meteorites; Tuesday—General Tour; Wednesday—Chinese Exhibits; Thursday—General Tour; Friday—Jade and Crystals.

Week beginning June 25: Monday—Reptiles, Past and Present; Tuesday—General Tour; Wednesday—Man Through the Ages; Thursday—General Tour; Friday—Plants of Unusual Interest.

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 C. E. Tober—a stone effigy pipe and a pottery vessel, Illinois; from Mrs. George H. Martin—2 carved horn spoons, Sitka Indians, Alaska; from Van Cleef Brothers—4 samples of rubber; from von Platen-Fox Company—a board of tamarack, Michigan; from Dr. Earl E. Sherff—71 herbarium specimens, Hawaii; from E. I. Du Pont de Nemours and Company—2 samples of synthetic rubber; from Franklin G. McIntosh—8 specimens of minerals, California; from Colonel V. H. Surghor—an Alaskan mountain sheep head; from Karl Plath—a South American tanager and 2 bird skeletons; from Miss Bertha Cramer—2 bird skeletons, Illinois; from Mrs. E. Walton—a golden-crowned kinglet and skeleton, Illinois; from A. G. and Raymond B. Becker—81 specimens of invertebrate fossils, Florida; from Leon Mandel—5,000 feet of motion picture film taken during the Leon Mandel-Field Museum Zoological Expedition to Guatemala; from Lieutenant Seeley A. Wallen—a wild boar and a jungle fowl, Philippine Islands.

NEW MEMBERS

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

Contributors

Mrs. Sarah S. Straus

Associate Members

Mrs. Frederick C. Gifford, Miss Helen K. Gurley, Mrs. Elmer A. Howard, Raymond J. Koch, Mrs. William S. Mills, Sigurd E. Naess, James P. Soper, Jr., H. E. Willis.

Annual Members

Charles S. Babcock, Mrs. Anna K. Brown, J. Amos Case, Dr. Fremont A. Chandler, Edmund J. Clausen, Henry Townner Deane, Harry L. Diehl, David W. Edgar, Earl E. Enos, Dr. Alexander Gabriellian, Mrs. John L. Gardiner, Robert N. Golding, Joseph B. Hawkes, Garner Herring, Haven Core Kelly, Arthur W. Nelson, Joseph J. Nevotti, Dr. Edward H. Ochaner, C. N. Owen, Dwight S. Parmelee, William D. Price, L. J. Quetsch, T. E. Quisenberry, John Glen Sample, Rev. Dudley S. Stark, William O. Traher, F. K. Vial, Charles Weiner, Elmer Zitzewitz.

Zinc and Lead Ores

A group of zinc and lead ores from the Embree Mines of Tennessee, recently presented by Charles P. Wheeler, is of unusual interest. These ores have the appearance of cave deposits. Stalactites, stalagmites and other cave formations, which in ordinary caverns are composed of carbonate of lime, are in this deposit composed of the carbonates of lead and zinc and the silicate of zinc. Many of the specimens are pure white with a good luster which is exceptional in ores of this kind. They may be seen in Frederick J. V. Skiff Hall (Hall 37).

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SCULPTURES OF PRIZE BRITISH DOMESTIC ANIMALS EXHIBITED IN NEW HALL

By H. B. HARTE
Managing Editor, FIELD MUSEUM NEWS

The finest animals in the service of man, as immortalized in bronze and stone by a skilled artist, have been placed on exhibition in a special new hall of Field Museum,



Field Marshal V

Shire stallion bred by and the property of His Majesty King George V of England. Chiseled bronze plated with gold.

which henceforth will be their permanent repository.

The opening of this hall, designated as Hall 12, and located on the first floor adjacent to the southwest end of Stanley Field Hall, marks a new departure in the policy of the Museum with respect to its presentation of the science of zoology. Hitherto the scope of the Department of Zoology has been limited exclusively to wild animals. The new exhibit consists of sculptures representing a number of champion domestic animals of Great Britain. In these the Museum, for the first time,



Sudbourne Premier

Suffolk Punch stallion. Bronze plated with gold and ornamented with lapis lazuli, ivory and onyx.

presents material for the study of the physical characteristics of outstanding breeds of the live stock upon which man is dependent for so much of his food and clothing, as well as the horses which have transported his burdens, dragged his ploughs through the fields, and pitted their speed and endurance against each other on the race courses for his sport.

These animal figures are the work of the noted sculptor, Herbert Haseltine, who for years has devoted his efforts to the portrayal of examples of such splendid creatures of the farm and the turf. The collection, comprising some nineteen models scaled to one-quarter life size, has been acquired by the Museum through the generosity of Trustee Marshall Field, who purchased it and presented it to the institution.

The sculptures are notable both as examples in natural history and as artistic creations. They not only represent the actual winners whose mettle has been proved in the stock shows and on the race courses,



Twyford Fairy Boy

Hereford bull. Bronze partially plated with gold.

but they typify the physical characteristics of various outstanding breeds with which everyone ought to cultivate at least a slight familiarity.

Some of the bronze figures are plated with gold, and ornamented with lapis lazuli, ivory and onyx. In the case of the others, carved in stones of various hues and textures, certain marbles and limestones were chosen because they were particularly suitable for reproducing the colors and characteristics of some animals. A few of the sculptures, however, are not naturalistic in color, but are carved in materials selected for their artistic effect.

Work on the series was begun by Mr. Haseltine in the summer of 1921, when he modeled the champion Shire stallion, *Field Marshal V*, a noble representative of the equine tribe from the stables of His Majesty King George V of England. This sculpture is pictured among the illustrations accompanying this article. Models of other animals were made between 1922 and 1924, in various parts of England, Scotland and Ireland, and in succeeding years the collection was augmented and perfected. The sculptures have been exhibited in Paris, London, New York, and Boston.

In *Field Marshal V* and another Shire stallion represented in the collection, their feet flounced with hair as is typical of this breed, the characteristics of the strong patient draft horse are at once recognizable. *Sudbourne Premier*, representative of the Suffolk Punch breed, another fine draft horse, possesses qualities which remind of

days when horses bore knights with heavy coat-of-mail and caparison. This horse also is illustrated with this article. The French Percherons, another draft horse type imported into England since the war and now a formidable rival of the others, are represented in this collection by a sire, a mare,



Polymelus

Thoroughbred; winner of many races, and champion sire for years. Bronze.

and a colt. The sire, *Rhum*, is shown in a picture on page 3.

Contrasted with these powerful heavily built beasts of burden are the fleet-footed and light-framed performers of the race course and the polo field. Among these is a sculpture of a composite of the thoroughbred type, and a life study of *Polymelus*, winner of many races on the flat, and in 1916, 1920 and 1921 at the head of the list of winning sires. *Polymelus'* progeny have won a total of more than a million dollars (£220,000). Another noble thoroughbred, of a different type adapted to specialized



Southdown Ewe

Sheep bred by and the property of His Majesty King George V. Bronze plated with gold.

racing, is *Sergeant Murphy*, famous steeple-chaser, winner of the Grand National at fourteen years of age. *Polymelus* is the subject of one of the illustrations herewith. To represent the type of the heavy-weight polo pony the sculptor has modeled *Perfection*, a strong stocky horse bred in Ireland. It is an admirable specimen of these animals

(Continued on page 3)

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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HENRY W. NICHOLS.....	Acting 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:

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, 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.

MANDEL EXPEDITION CONCLUDED

Operations in the field of the Leon Mandel Guatemala Expedition of Field Museum have been concluded, and the last member of the party, Emmet R. Blake, ornithologist, returned to the Museum in June. The expedition was sponsored by Leon Mandel of Chicago. After checking over the resulting collections, members of the Museum's zoological staff pronounced it an extremely successful venture.

Three other members of the expedition returned to Chicago late in April, while Mr. Blake stayed on to complete work in the desert region and on the Pacific coast of Guatemala. There he made a comprehensive collection of birds and small mammals. Nearly all sections of the country received the attention of the various collectors, and thus, in addition to specimens for a number of spectacular exhibition groups which are to be prepared, large representations of the fauna of the various regions have been added to the Museum's study collections.

THE USE OF TREE RINGS IN DATING RUINS

BY PAUL S. MARTIN

Assistant Curator of North American Archaeology

For many years, people have wondered about the age of the cliff houses and other ruins in the Southwest. Within the last few years a method for determining the building dates of these ruins has been worked out by Dr. A. E. Douglass of the University of Arizona.

An exhibit illustrating this method, which is called tree-ring chronology, has recently been installed in Hall 7 (Archaeology and Ethnology of the Southwestern United States). In this exhibit, which was presented by Harry T. Getty, of the University of Arizona, the entire tree-ring process of dating is briefly explained and illustrated by means of polished sections of wood, and by charts and photographs. Also shown are sections of the original roof beams from seven famous southwestern ruins, photographs of which are displayed.

Tree-ring dating was a chance discovery. Dr. Douglass, an astronomer, who developed this method in the course of his studies on sun spots, found that disturbances in the sun affect weather and therefore the growth of trees. But more important, he found that drought and flood were registered in tree rings, especially those of pine trees, because the width of the annual tree ring is governed chiefly by the amount of available moisture, as supplied by rain and snow. That is, wet years produce broad rings; dry years, narrow rings.

By careful study of hundreds of trees from various localities in the Southwest, Dr. Douglass has derived an unbroken succession of tree-ring patterns from A.D. 1934 back to A.D. 643. From the information thus yielded, he has also been able to plot a continuous weather record or tree-ring calendar for the same period.

Perhaps the most difficult element to understand in this system is the way the tree-ring calendar has been built up. It may be explained in three simple steps:

1. A yellow pine is cut down today (1934). The age of this tree is determined by counting the annual growth rings, of which there may be 300. In other words, the tree started its growth in the year A.D. 1634. The expert carefully notes the patterns formed by the sequences of broad and narrow rings, which indicate wet and dry years.

2. Since it is impossible to find a pine old enough to carry back the tree-ring count to prehistoric times, that is, before the Spanish conquest, A.D. 1540, it is necessary to seek a tree which began its growth before A.D. 1634 and which was cut down after A.D. 1634. The most logical place to seek such a log would be in the roofs of the Indian houses or pueblos which were built in what is called the historic period (after A.D. 1540). If the youngest or outer ring patterns in such a log match the oldest ones in the preceding specimen, the tree would thereby be dated automatically and would provide the necessary overlap, thus carrying back still farther the tree-ring record.

3. The next step involves a search for another beam, the youngest ring patterns of which must match the oldest or inner patterns of the preceding log. Again, such a piece of wood, when found, would provide the necessary overlap, and again would extend the record backward in time. The search for other overlapping logs is a never-ending one. As stated above, the earliest date at present so recorded is A.D. 643.

One fact should be understood. Trees growing on ruins are not employed for dating purposes, because evidently they started to grow after the building was deserted. The wood specimens which are used for dating come from logs which were used as roof beams or door lintels.

Two New Trustees Elected

At its meeting held on June 18 the Board of Trustees of Field Museum elected two new Trustees. The new members of the Board are Leslie Wheeler and Joseph Nash Field, son of President Stanley Field. Messrs. Wheeler and Field will fill places on the Board which have been vacant since the deaths of the late William V. Kelley and Martin A. Ryerson.

DISTINGUISHED VISITORS

His Highness Sultan Ibrahim of Johore, and the Sultana, accompanied by Mr. and Mrs. Frank Buck, visited Field Museum on June 7. The Sultan, himself a well-known hunter of big game, was intensely interested in the habitat groups of mammals, while the Sultana expressed great enthusiasm over the Races of Mankind sculptures in Chauncey Keep Memorial Hall.

Baron and Baroness Maurice de Rothschild of Paris visited the Museum on June 11. The Baron also has done much hunting, in India and Africa, and found the habitat groups of animals of striking interest. The Chinese collections in the Department of Anthropology also received his special attention.

Captain H. C. Brocklehurst, former Game Warden of the Sudan, was a visitor at the Museum on June 12. He is the author of well-known books on African game animals.

On June 15 Captain Maurice Rossi and Lieutenant Paul Codos, the French aviators who recently made a trans-Atlantic flight, were guests of the Museum, in company with René Weiller, French Consul-General.

Sir Henry Wellcome, distinguished scientist, Founder and Director of the Wellcome Historical Medical Museum in London, was a visitor at Field Museum on June 20. Sir Henry is known internationally for his researches in the medical field and is noted also as an explorer and archaeologist.

The formation of peat is illustrated in a geological exhibit of the Museum.

PACIFIC ETHNOLOGY EXHIBIT IS AUGMENTED

Two cases of artifacts, selected from the large collection of ethnological material from islands of the Pacific recently presented to the Museum by Templeton Crocker of San Francisco, are now on exhibition at the south end of Joseph N. Field Hall (Hall A). This material was collected on Mr. Crocker's Pacific Expedition of 1933. In all he has presented to the Museum 854 ethnological objects, and 323 photographs. More of this collection will be placed on exhibition at a later date.

Regarding the work and results of the expedition, Mr. Crocker writes, in part, as follows:

"A six months' cruise was undertaken in my 118-foot power schooner *Zaca*, for the purpose of ethnological study and a medical survey of certain of the Santa Cruz and Solomon Islands, particularly Rennell and Bellona Islands of the Solomons. Twenty places were visited. There was general collecting of birds, insects, plants, shells and fishes.

"Gordon MacGregor, anthropologist of the Bishop Museum at Honolulu, covered the islands Puka Puka, Tucopia, Sikaiana, Guadalcanar, Malaita, Rennell, Bellona, Ugi, Santa Anna, Santa Catalina, Reef, Anuda, and Sydney and Hull of the Phoenix group. Over one hundred anthropometric measurements were made and more than two thousand objects of native craft were collected. Sound records of singing were made at Rennell Island, and ten thousand feet of motion pictures were taken showing native life and particularly dancing at Rennell, Bellona, Santa Catalina, and at Graciosa Bay on Santa Cruz Island.

"Toshio Asaeda, the artist and photographer, took over twelve hundred photographs of ethnological interest, and made over one hundred water color drawings of fishes and marine life.

"Doctor S. M. Lambert, representative of the Rockefeller Foundation and the Western Pacific High Commission at Fiji, joined the cruise at Suva. Among the natives he made tuberculin injections and filaria examinations, yaws injections, took blood specimens and made a general health survey. About four thousand natives were examined."

As the ethnological collection was made largely by Mr. MacGregor, the Bishop Museum at Honolulu had first choice, but because of Field Museum's extensive and interesting exhibits from the Pacific, Mr. Crocker gave the Museum the next choice together with some interesting specimens of his own collecting, including a large ornamented Marquesan wooden bowl.

This collection is especially acceptable and valuable to Field Museum, as the islands most studied by the expedition—Rennell, Bellona, and Anuda—were hitherto entirely unrepresented in the Museum collections.

PRIZE DOMESTIC ANIMALS

(Continued from page 1)

which are as keen at their swift-moving game as the players who ride them.

Hereford, Aberdeen Angus, and Shorthorn varieties of bull, and a Shorthorn dairy cow, are represented in the series. The Hereford, *Twyford Fairy Boy*, shown in a picture on page 1, is an animal with a dark red coat in contrast to which are a white head, legs and tail. It has hair which is almost as curly as that of a sheep. The Aberdeen Angus is a Scottish breed, black coated,

and without horns. The Shorthorn bull, modeled in red Acajou marble, is *Bridgebank Paymaster*, prize-winner both in England and Scotland for three successive years.

Two Lincoln rams and a Southdown ewe were selected to represent the sheep. The Lincoln is celebrated for its fine and abundant wool; the Southdown is especially esteemed for its delicious meat. The South-



Rhum
Percheron stallion. Bardiglio marble.

down used as a model is the property of King George, and the sculpture of it is shown in one of the accompanying illustrations.

Models of three extraordinary swine are included in the series. One is a Berkshire boar, and is pictured with this article. The Berkshires, one of the best known varieties of pigs, are raised in great numbers in the United States as well as Great Britain. The other swine are Middle Whites, a boar and a sow, carved in pink marble. They are descendants of a Chinese breed which was imported into Yorkshire in the eighteenth century. Among their characteristics are a squat turned-up nose and stiff ears.



Highfield Royal Pygmallon
Berkshire boar which belongs to the Duke of Westminster. Chiseled bronze partially plated with gold.

Great Britain has for many years encouraged the raising of fine horses and stock of all kinds, and the animals represented in the Haseltine sculptures were modeled from life, and are worthy examples of the best of their respective breeds. The sculptor made his studies of them in their various moods and postures by visiting them in their stables, their stalls, and their pens.

(Note: The Museum has published a leaflet containing photographs of all the Haseltine sculptures with brief descriptions and an introductory text. This is on sale at the Museum at 25 cents per copy, plus 3 cents for postage if ordered by mail.)

The Herbarium of Field Museum now contains more than 700,000 plant specimens.

THE LITTLE PIGS OF TIBET AND THE BIG BAD WOLF

BY BERTHOLD LAUFER
Curator, Department of Anthropology

In a case illustrating the art of writing and printing in Tibet, recently placed on exhibition in Hall 32, are displayed two interesting wood-engravings, one showing two fierce wolves, the other a goddess on a chariot drawn by nine pigs. The first of these is a charm to protect the owner of large flocks against depredations of wolves. Wolves are plentiful all over Tibet and Mongolia, and occur in two varieties, a gray and a black one. The wolf is so much dreaded by the shepherds that the proper word for it is timidly avoided in conversation; using it is believed to portend the destruction of flocks. Consequently the wolf is euphemistically referred to as "the wild dog" or "stumpy tail."

The economic structure of Tibetan society is based on a skilful combination of agriculture and cattle-breeding in such a manner that labor is equally divided between two distinct tribal groups. There are a sedentary and a nomadic section of the population, the former living in villages and houses and tilling the fields, the latter roaming on the grassy highlands with their herds of horses, cattle, and sheep. The two classes are strictly segregated and never intermarry, but they depend on each other economically and exchange their products for their mutual benefit. Only the agriculturists rear swine and fowl; the nomads never do, since swine and fowl are sedentary creatures.

In the exhibit will be found the first page of a volume printed in vermilion in the imperial palace of Peking in A.D. 1700. This is one of a hundred large volumes known as the Kanjur, containing the sacred scriptures of Buddhism in the Tibetan language, published by order of the emperor K'ang-hi. It is one of the most beautiful prints ever issued. The page in question is adorned with the miniature of the goddess Marichi, who is celebrated throughout Tibet, Mongolia, and China. She is a creation of India, where she was a personification of light, a goddess of the dawn, an offspring of Brahma and mother of the sun-god. The Chinese still call her the Queen of Heaven. In Tibet she underwent some transformations, and is regarded as being able to incarnate herself in the form of a sow, an ancient emblem of fertility. She is represented as enthroned on a chariot drawn by a sow who is surrounded by eight little pigs. In a case in Hall 32, devoted to the pantheon of Lamaism, may be seen a sculpture in copper of this goddess on her pig chariot. She has three faces, two of which are human, and one the face of a swine. She is the national guardian deity of Tibet, and is worshiped in a special temple on Yamdok Lake.

The temple is ruled by an abbess who is believed to be an incarnation of Marichi and who according to tradition has behind her ear an excrescence resembling a sow's head. The story goes that some two hundred years ago a Mongol prince, who in this case played the role of the big bad wolf, attacked her monastery, shouting insulting challenges to the abbess to come forth and show her sow's head. When the Mongols destroyed the walls and marched into the courtyard, they were amazed to encounter merely a herd of pigs led by a sow. The prince at once halted the pillage, and the pigs became transformed into monks and nuns, the largest sow into the abbess herself. The Mongol prince became converted at the sight of this miracle and enriched the monastery with a generous endowment.

POISONOUS WOODS

By LLEWELYN WILLIAMS
Assistant Curator of Economic Botany

Many fantastic and exaggerated tales have been written about the virulent and poisonous properties of the sap exuded by the upas tree (*Antiaris toxicaria*) of the Malay Archipelago. Froesch, a Dutch surgeon, wrote in the eighteenth century that criminals condemned to die were offered the chance of reprieve if they would approach the upas tree and collect some of the poison. Such was reputed to be the virulence of the resin that "there are no fish in the waters, nor has any vermin been seen there, and when any birds fly so near this tree that the effluvium reaches them, they fall a sacrifice to the effects of the poison."

Although these accounts have since been discredited, the aborigines of the Malay Peninsula still use the sap as poison on the tips of arrows and blow-pipe darts. In some cases proximity to a poisonous tree alone might actually be sufficient to poison a person. Likewise, smoke from burning branches of trees like the mango (*Mangifera indica*), which belongs to a family known for its poisonous juice, might be injurious. In this same family are included poison sumach, poison ivy and the Japanese lacquer tree. Wading in water contaminated with latex exuded from the fruit of the rengas trees (*Gluta* and *Melanorrhoea*) also of this family, or the use of furniture made from their woods, may likewise cause poisoning.

It has long been recognized that skin disease can be caused by contact with woods or with dusts produced in working with woods. Among tropical woods capable of causing cutaneous disease are ebony, greenheart, imbuia, mahogany, andiroba, gonçalo alves, padauk, purpleheart, teak and lignum vitae. All of these are on exhibition in the Hall of Foreign Woods (Hall 27). Although poisonous woods are mostly of tropical origin, several domestic woods are also known to be responsible for dermatitis. Among these may be mentioned poplar, yew, black alder, paper birch, pencil cedar, white pine, Norway pine, redwood, Norway spruce, Sitka spruce, Port Orford cedar and arbor vitae.

The toxic agents are mostly nonsaturated resinous acids in a free state, or alkaloids. Freshly cut wood is usually most toxic, although occasionally the toxicity increases as the wood seasons. In some instances tolerance may be acquired, but, as a rule, sensitivity once established is said to be persistent.

"PETRIFIED LIGHTNING"

Specimens of "petrified lightning" form a striking exhibit in Clarence Buckingham Hall (Hall 35). They are properly known as fulgurites, and consist of long narrow tubes of glassy appearance and consistency formed by rock or sand melted when struck by lightning and "frozen" into the shape of the lightning streak.

Prominent in the collection is an unusually large fulgurite, found in a sand dune near Chesterton, Indiana. It is nearly ten feet long. Several smaller ones obtained in sand dunes near Michigan City, Indiana, and from other localities, are also on exhibition.

Fulgurites are produced by the fusion of the particles of sand or rock when struck by lightning. This fusion follows the path of the electrical discharge, usually forming hollow tubes, but sometimes taking other shapes. The interior of such tubes is usually smooth, and the outside rough. The

tube formation begins at the surface, and continues downward until the power of the lightning stroke is dissipated. The tubes usually taper down somewhat with the lessening power of the stroke. Sometimes when the electrical discharge takes two paths a forked fulgurite results.

Peruvian Textiles

A newly installed case of Peruvian textiles, made probably between A.D. 1000 and 1500, has been placed on exhibition in Stanley Field Hall. The series represents garments worn by the Incas and pre-Inca peoples, whose possessions owe their remarkable preservation to the dry climate of the Peruvian coast.

The skill in weaving of the ancient Peruvians finds no equal in the modern world. Indeed, the best tapestry of Europe, such as the gobelins, appears coarse in comparison with the average example of Peruvian tapestry.

Other techniques in which the ancient Peruvians excelled were brocade, embroidery, gauze, bobbin weave, pile knot, and double weave. Weaving was done on a simple hand loom.

PARKING AT THE MUSEUM

As announced in the June issue of FIELD MUSEUM NEWS facilities have been provided for the parking of the automobiles of visitors to the Museum on the grounds at the west entrance of the building. Attendants are stationed there and at the north side of the Museum to assist visitors. A small charge is made for the parking service.

SACRIFICIAL KILLING IN AFRICA

Although head-hunting and human sacrifice are officially banned by colonial governments in Africa, they are so deeply entrenched in the culture of some tribes that the most careful supervision is necessary to prevent a recrudescence. A few years ago, near Katsina Ala in the country of the Munshi tribe, southeast Nigeria, the writer, while on the Frederick H. Rawson-Field Museum Ethnological Expedition, observed several prisoners, benign-looking old men whose mildness of manner seemed to belie the charge against them. They were accused, and apparently with good reason, of the use of human blood for fertilizing the ground, and the victims were supposed to have been led to death by the use of magical decoys.

Two skulls, now in Field Museum, were presented after their use as evidence in a trial of Nigerian head-hunters a few years ago. Head-hunting is likely to survive, because it has been the custom for each amorous young man to capture a head to convince his intended bride of his courage and prowess. Cannibalism may also continue surreptitiously, because of the belief that by eating parts of dead foes one may acquire their virtues. The eating of dead relatives was a part of the funeral ritual of several tribes of the plateau region of eastern Nigeria.—W.D.H.

Rare Saiga Antelope

Male and female specimens of the rare Saiga antelope of Turkestan are to be seen in the Department of Zoology. These antelopes have large queer proboscis-like muzzles. The male has beautiful amber-colored horns, while the female is hornless.

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 the principal gifts received during the last month:

From Hubert Beddoes—a folio album containing 134 large photographs taken in China, Japan, and Java; from H. W. Seton-Karr—10 paleolithic stone implements, Somaliland; from Museo Nacional—54 herbarium specimens, Costa Rica; from School of Forestry, Yale University—33 herbarium specimens, Ecuador; from Mrs. Ynes Mexia—29 herbarium specimens, Mexico; from Frank von Drasek—a specimen of cinnabar, Arkansas; from Leon Walters—27 specimens of minerals and 45 specimens of invertebrate fossils and fossil plants; from Miss Virginia Lee—225 specimens of fulgurite, Wisconsin; from Mrs. E. Walton—4 bird skeletons, Illinois; from General Biological Supply House—a lung fish, Africa, and 11 specimens of frogs, snakes, and salamanders; from Marshall Field—19 sculptured figures of British champion animals; from Mrs. Charles C. Richards—a collection of birds' eggs and ecological pamphlets, North America; from Chicago Zoological Society—3 kangaroos, 3 birds, 11 lizards, and 3 snakes; from Lincoln Park Zoo—an infant orang; from Dr. L. C. Sanford—a Mexican bear skin; from Dr. C. C. Liu—40 frogs, toads, and lizards, China; from Edward Brundage, Jr.—a coral king snake, Florida.

NEW MEMBERS

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

Associate Members

Robert O. Blair, Dr. Joseph Brennemann, John F. Caine, Benjamin J. Curtis, Henry E. Greene, Adolph R. Haas, Mrs. E. H. Little, William R. Odell, Jr., Mrs. John Eliot Warner.

Annual Members

Hugo Anbeiser, L. Beers-Jones, Louis Dulsky, Edward George Gantner, Harold Hall, Professor Asher Hobson, Ambrose J. Krier, Horace E. Newcomet, Mrs. George F. Nixon, Dr. Eric Oldberg, Bud H. Rader, Joseph Regenstien, Arthur Richter, J. Parker Smith, Lawrence M. Stein, Mrs. George Craig Stewart, Morris Wulbert.

Broken Bones among Fossil Animals

The accident of broken bones appears as commonly among fossil animals as among recent ones. The large skeleton of a dinosaur in Ernest R. Graham Hall (Hall 38) has a knot on the fifth rib of the right side which clearly shows that the rib had been broken and healed during the life of the animal. A skeleton of a wolverine-like carnivore has the bones of the lower hind leg broken. The ends slipped past and healed in such a way as to make these bones one and a half inches shorter than those of the opposite side. It is common to find two or three bones of the tail of a dinosaur grown together in one piece. Broken and ulcerated teeth are also quite common.—E.S.R.

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MURAL DEPICTS FLYING REPTILES AND PRIMITIVE BIRDS OF JURASSIC AGE

By BRYAN PATTERSON
Assistant in Paleontology

The painting shown in the accompanying illustration, and exhibited in Ernest R. Graham Hall (Hall 38), represents a scene on the shore of a lagoon that existed some 150,000,000 years ago in that period of the earth's history known as the Jurassic. The successive layers of sediment that were deposited in its quiet waters now furnish the lithographic stone quarried near Solenhofen, Bavaria. The exquisitely preserved fossils found in the quarries furnish a remarkably complete picture of the animals and plants that lived around the ancient shores, and a few of the most interesting of these have been selected for reproduction.

The plants shown are all cycads, members of an early group of seed bearing plants. The two types of reptiles belong to extinct orders. The birds are the earliest that have yet been found; since they were about the size of a crow they furnish an excellent size scale for the painting.

The reptiles in the left foreground that have been disturbed by the birds in the act of examining a stranded crustacean are dinosaurs of the genus *Compsognathus*. Contrary to popular belief all dinosaurs were not large. These diminutive relatives of the giant *Tyrannosaurus* were very near the minimum of size for their group. They were active, quick-moving flesh-eaters that probably preyed on other small reptiles, certain types of invertebrates, and such birds as were unwary enough to be caught by them.

The flying reptiles or pterosaurs are represented by the peculiar *Rhamphorhynchus*, an

animal with a long head, large, forwardly inclined teeth and a long tail that ended in a peculiar leaf shaped expansion of the skin. The long tail is a heritage from generalized reptilian ancestors. In other pterosaurs, more specialized in character, it was greatly

deposits, a fact which leads to the supposition that the majority of them frequented shores and probably fed chiefly on fish. These creatures reached their zenith during the Jurassic. In the succeeding Cretaceous period they rapidly dwindled in numbers, their place being taken by the more efficient birds.

The birds represented in the painting belong to the genus *Archaeornis* and, although fully recognizable as birds, they are by far the most primitive members of their class yet discovered. Their skeletons show many features that have been retained from their reptile ancestors. Thus the head is furnished with sharp, conical teeth, the articulations of the backbone are of the reptilian type, and the fingers of the arm are free and clawed. The tail is perhaps the most interesting single feature of the animal. In modern birds this appendage is very short, compact and carries the tail feathers spread out fan-wise. In *Archaeornis* the tail is long and reptile-like with the feathers carried on the sides, one pair to each vertebra. The breast bone was weak and the wing expanse short. These structural

features indicate rather poorly developed powers of flight. It is probable that *Archaeornis* lived mainly in the trees and used its clawed fingers as an aid in climbing around branches and leaves.

The painting is one of the series of twenty-eight murals by Charles R. Knight, presented to Field Museum by Ernest R. Graham. In addition to their portrayal in this painting the animals are also represented by casts exhibited in Ernest R. Graham Hall.



Life in the Air 150,000,000 Years Ago

Mural painting in Ernest R. Graham Hall restoring the strange flying reptiles and lizard-like birds of which fossil remains have been found in Bavarian quarries of lithographic stone.

reduced. Flight was accomplished by means of a membrane of skin extending from the arms to the sides of the body. The main support for the membrane was furnished by the enormously elongated fourth finger. The fact that there was thus only one supporting axis for the entire wing was probably a serious defect in the flying mechanism of these animals. Any tear in the membrane would have seriously, if not totally, incapacitated the individual affected. Remains of pterosaurs are usually found in salt water

A Rock That Bends

Although rigidity is a property usually expected of all rock, there is a specimen of sandstone in Clarence Buckingham Hall (Hall 35) that is flexible and can be bent easily. This flexible sandstone, called itacolomite, is found only in Brazil and North Carolina. It is made up of grains of sand which were once held together by a mineral cement which has since dissolved. Usually when the cement of a sandstone dissolves the rock disintegrates into loose sand. In this

rock the sand grains cannot fall apart as they are so shaped that they interlock or dovetail. The absence of cement allows play between the grains and makes possible the bending of the rock.

Basket Maker Art

The earliest people inhabiting the Southwest, about whom a great deal is known, are called Basket Makers. Although they were not highly civilized, yet they possessed many artistic impulses. Even their everyday household articles were beautiful. On

exhibition in Hall 7, in a case devoted solely to Basket Maker material, there is shown an exquisite carrying band or tump-line head-piece. The design on this specimen is painted on the surface of the band and not woven in. Although made 1,500 or 2,000 years ago, the colors are still very bright.

Japanese Ambassador Visits Museum

Hiroshi Saito, the Japanese Ambassador to the United States, was a visitor at Field Museum on June 28.

Field Museum of Natural History

Founded by Marshall Field, 1893
Roosevelt Road and Lake Michigan, Chicago

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FIELD MUSEUM NEWS

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

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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, 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.

ANCIENT PALACE CURTAINS OF MANCHU EMPERORS

BY BERTHOLD LAUFER

Curator, Department of Anthropology

Seven highly artistic bamboo curtains, made exclusively for the palaces of the Manchu emperors of China, have recently been installed in Hall 32 (West Gallery). These were obtained by the writer, while leading the Marshall Field Expedition to China in 1923, from a Manchu prince of high rank, and there are good reasons to believe that they are the only ones ever brought out of China. Because of their rarity, their unique and complex technique, and their artistic merits, they may justly be regarded as priceless treasures.

These curtains are the product of toil amazing for the infinite patience and endurance required. They consist of very fine, slender rods of the so-called spotted variety of bamboo, brown and yellow in color, and perfectly matched. Designs or pictures are formed by strips of silk of various colors wrapped around each rod. The rods are hardly one-sixteenth of an inch in thickness, and are finished alike on both sides.

One of the curtains pictures a lotus pond tenanted by three cranes (*the crane is an emblem of longevity*), toward which another crane is swooping down. Two other curtains are decorated with phoenixes soaring in clouds toward the rising sun. They are surrounded by peonies and butterflies. In others veritable paintings are skillfully reproduced. There is an exquisite mountain landscape, in which a scholar is seen leisurely rocking in a boat; an open pavilion with books piled on a table is his retreat for study; the white background, denoting atmosphere and water, is formed by wrappings of white silk. In another landscape rocks, ground, a bridge, and trunks and branches of trees are indicated by the bamboo rods in their natural colors without silken strips.

Curtains of this type were hung in the doorways of the imperial palaces and could be pulled up like our window blinds or shades, the idea of which, incidentally, originated in China. They served practical purposes, being so constructed that they allowed the admission of air and light, and permitted a person in the room to see any one approaching from outside, while preventing an outsider from seeing what was going on within the room. When the sunlight came through the narrow interstices of the bamboo rods, the person in the room could enjoy a reflection of the curtain picture on the opposite wall.

Plain bamboo curtains or blinds in doors and windows are common in mansions all over China; only those adorned with silken pictures were reserved for the imperial palaces. A plain one is shown on the floor of the exhibition case.

In Anglo-Indian this type of screen-blind is called *chick* (also spelled *cheek*) from an Indian word *chik* that probably goes back to a Chinese prototype. The chicks of India are either plain or have designs painted directly on the bamboo rods—the silken pictures of China are unknown there. They first reached India through the Mongols, who used such curtains in their tents. Clavijo, a Spanish envoy to the court of Timur (Tamerlane) at Samarkand in A.D. 1404, describes the tent of Timur's chief wife thus: "This tent had two doors, one in front of the other, and the first doors were of certain thin colored wands, joined one to another like in a hurdle, and covered on the outside with a texture of rose-colored silk, and finely woven; and these doors

were made in this fashion, in order that when shut the air might yet enter, while those within could see those outside, but those outside could not see those who were within."

Among the nomads of central Asia a tent was, and still is, a man's castle, a sacred and inviolable spot. No one dares to enter a tent without the owner's consent, and intruders may be killed with impunity. A screen door is indispensable to the tent-dweller. Through it he may, unseen, spy from a distance upon a newcomer to determine whether he is friend or foe, and may then regulate his conduct accordingly.

The Mongols, after their conquest of China, founded Peking and made it the capital of their far-flung empire. As free sons of the steppe they laid the city out on the plan of a war camp, with their palace in the center, and their vassals and banner-men grouped around it in regular square blocks. Thus Peking was the first modern city with straight avenues and wide streets many miles long and built according to a plan. Among their many nomadic customs the Mongols introduced the screen or curtain door into the palace, and the Manchus, formerly also bold horsemen of the steppes of Manchuria, perpetuated the tradition of their predecessors for whom they felt a strong racial and cultural affinity.

THE USE OF TRADE-MARKS IN ANCIENT ROME

That quantity production manufacturing methods may have been carried on in the days of ancient Rome, and that a system of trade-marks similar to modern practice may have been employed in labeling goods placed on the market, is indicated by an ancient Roman flour mill on exhibition in Edward E. and Emma B. Ayer Hall (Hall 2).

The mill, unearthed from the ruins of Boscoreale near Pompeii, is a clever mechanical contrivance. It bears on one of its stones the incised letters "PMA." Archaeologists have found these letters incised on a number of other millstones from Pompeii, while still others bear different combinations of letters. The inference is that the letters may have had something to do with identifying the stones with ancient factories which prepared them for use.

The mill consists in its principal parts of two lava stones carefully shaped to serve the purpose for which they were designed. The lower stone is cylindrical at its base, about one-half of which was buried in masonry to anchor it firmly. The upper surface of the masonry formed a trough covered with a sheet of lead which is also preserved in the Museum. The top part of the lower millstone is cone-shaped and the upper millstone resembles an hourglass. Each of its cone-shaped component parts is hollowed out. Its lower cavity fits over the cone of the lower stone, and the hollow of the uppermost cone opens above to receive the grain. A framework of wood and iron supports the upper stone on a pivot. The mill was operated by turning the upper stone with projecting bars like a large hand windlass. Men or animals, or both, may have been employed for the purpose. The grain, poured in the top cavity or hopper, was ground between the stones by the turning motion, and was collected in the trough at the bottom.

Also on exhibition is a smaller Roman mill, apparently for hand operation to serve a single household. It comes from the same locality, and the principles of operation are similar.

AFRICAN MUSICAL INSTRUMENTS

Various peculiar types of musical instruments of Africa, from the weird sounds of which have been derived, in a roundabout way, the motifs of much of the most modern music of America and Europe, are on exhibition in the hall of African ethnology (Hall D).

"Pianos" of a primitive type made and played by tribesmen in various parts of Africa form one of the most ingenious and interesting of the native instruments. The basic principle in the construction of these is very closely allied to that of our pianos—that is, a sounding box with the notes produced by finger keys tuned to various pitches. However, in the African form the sounds are produced by the keys themselves instead of by strings operated by the keys. In some parts of Africa the keys are cane strips cut to various lengths and attached to a drum-like section of a hollowed out log, or a gourd. The keys are adjustable so that pitch may be changed by altering the vibrating length; and still further variations are obtained by attaching wax to the under side of the keys. In Angola, the Congo, and some other regions, metal is used for keys. In playing these pianos the keys are stroked rather than struck with the fingers.

An elaborate xylophone with wooden keys, from East Africa, not at all unlike the xylophones of the western world, is another interesting exhibit. There are many harp-like instruments with various numbers of strings of hair, sinew, and twisted vines. The ordinary hunter's bow is used as a musical instrument by placing one end in the player's mouth to act as a resonator, and tapping the bowstring with an arrow. Other native instruments shown include various types of drums used for music for entertainment, and for exorcising demons, mobilizations for war, and other ceremonies; and guitars, banjo-like instruments, flutes, rattles, gongs, whistles, horns and others.

A curious instrument is a wooden bell, not played by a human musician, but attached to the neck of a dog or other small animal to produce sound according to the caprices of the animal's movements.

"The Africans not only have a strong predilection for music, but in the manufacture of their instruments display a surprising mastery of technique and the principles of tone and tone-producing methods," states W. D. Hambly, Assistant Curator of African Ethnology. "Music has wide uses for purposes other than entertaining and dancing. Throughout African life, medicine, magic and music are inseparably linked in complicated rituals."

THE ALMOND TREE

By B. E. DAHLGREN

Acting Curator, Department of Botany

To the display of foreign nuts that form a part of the exhibit of food plants in Hall 25, the Department of Botany has added a reproduction of a California grown almond branch in fruit. This should prove of interest to many who have never had an opportunity to see how almonds grow.

As an ornamental flowering tree the almond is not unknown in this region or in northern latitudes in general, but it rarely succeeds in producing fruit in the north. This is because of its habit of early flowering—earlier than all other fruit trees of the rose family to which it belongs, and long before the last seven frosts of spring.

The almond is generally conceded to be a native of Persia, Afghanistan and Baluchistan, and to have spread from those

countries by cultivation. As in the case of many other cultivated plants, the history of its distribution from its original home may be traced more or less imperfectly through incidental mention of its existence in early Greek, Roman, Arabian and Chinese authors of various dates. It appears that for nearly 2,000 years it has been grown in western Asia and almost as long in all Mediterranean countries, where it is now thoroughly at home. On this continent, in spite of various initial difficulties due to insufficient knowledge of its habits, its cultivation has finally become well established on a large scale in California.

The almond is very similar to the peach, to which it is closely related. Its large pure white flowers, like the rose-pink ones of the



Almond Branch

The fruits and leaves of this tree, now grown in many parts of the world, may be studied in this reproduction on exhibition in Hall 25.

peach, make their appearance before the foliage. The fruit is peach-like, though oblong and compressed. Its firm flesh splits on maturing, liberating the seed, as may be seen from the specimen on display, which was prepared in the Plant Reproduction Laboratories of the Museum.

Genus Named for Museum Botanist

In a recent number of the *Archivos* of the National Museum of Rio de Janeiro, A. C. Brade has published a new genus of plants, *Standleya*, named in honor of Associate Curator Paul C. Standley. The group consists of three Brazilian plants, belonging to the Rubiaceae or coffee family, upon which Mr. Standley has published various papers in the Botanical Series of Field Museum.

G. Elliot Smith Knighted

Professor G. Elliot Smith, famous British anthropologist, and a Corresponding Member of Field Museum, recently was knighted by King George V of England. Professor Smith is professor of anatomy in the University of London.

LIFE DURATION OF REPTILES AND AMPHIBIANS

By KARL P. SCHMIDT

Assistant Curator of Reptiles

Popular impressions of the great ages reached by reptiles are partly justified, for the larger land turtles undoubtedly live for a hundred or more years, and crocodiles probably live more than fifty years. A search for actual records of longevity, however, is somewhat disappointing. The principal sources of information on this subject are the records of zoological gardens and aquariums.

Among salamanders and frogs length of life seems to be rather definitely proportional to the size reached by the species. The longest life on record for an amphibian is fifty-two years, attained by a Japanese giant salamander. The related American hellbender, a smaller species, has not been known to live much beyond seven years. The longest recorded life of an American bullfrog is sixteen years. Green frogs have been known to live ten years. The large common toad of South America has lived a dozen years in captivity, and potentially may be much longer lived. Smaller frogs, however, may live to a very considerable age, for an Australian tree frog lived seventeen years in the London zoo, and a European tree frog lived fourteen years.

Among the various groups of reptiles, snakes rarely live more than twenty years in captivity; but the records for this group are inadequate, and small vipers have reached as great an age as the large boas and pythons. The record age among lizards is thirty-one years, reached by the common slow-worm of Europe. Some of the large Australian skinks have lived about twenty years in captivity. The true chameleons of Africa and Madagascar appear to be very short lived, none living even to five years.

The strange lizard-like reptile of New Zealand, the tuatara, may be a long-lived creature, for specimens have lived more than fifteen years in captivity.

Large alligators and crocodiles are often thought to be extremely old because they grow very slowly in captivity. Under proper conditions of light and food supply, however, these animals grow rapidly to a considerable size. Ages of several hundred years, ascribed to very large specimens, are purely hypothetical, for the greatest recorded age for any crocodilian is that of the Chinese alligator brought to Europe in 1888 and still alive in the Frankfurt Zoological Garden.

Smaller turtles, both land and fresh-water species, have reached ages of from seventy to ninety years. From forty to fifty years seems to be a fair life expectation for an ordinary turtle. The giant land turtles of the Galapagos Islands and the even larger ones from islands in the Indian Ocean, are the longest lived of reptiles, with a normal life span of probably a hundred years or more.

A giant land tortoise was brought from the Seychelles Islands in the Indian Ocean, its native home, to the island of Mauritius in 1766, and was officially handed over to the British (with the island) in 1810. It lived in the artillery barracks at Fort Louis until 1918. Thus it had a positively recorded life of 152 years, and it has been estimated that this turtle was at least 200 years old when it died. This is not only the greatest age known in a turtle, but is the greatest recorded age for any backboned animal.

A habitat group of bobwhite quails is on exhibition in Hall 20.

THE GREAT SERPENT MOUND

BY PAUL S. MARTIN

Assistant Curator of North American Archaeology

Ever since it was first described in 1848, the Great Serpent Mound of Adams County, Ohio, has proved of great interest to both archaeologists and laymen. No other mound has provoked more fanciful interpretations.

The form of a serpent has been so faithfully copied that there is no doubt of the builders' intention to represent such a creature. The total length of this famous effigy, following the sinuous curves, is about 1,400 feet; the average height is from two to four feet.

The purpose or meaning of this serpent effigy is unknown. It was not used as a burial mound, so far as has been ascertained. All explanations of the Indians' object in building it are merely guesses. However, it is presumed that the mound had its origin in some sort of a ceremonial or religious concept. We know that the serpent played an important part in the religious life of many tribes. The serpent often typified the god of the upper regions (that is, the four winds and the four principal points of the compass), and also the gods of fire, rain, sun, clouds, thunder, and rainbows. In the southern parts of North America, it was depicted with plumes or feathers, and in the north with two or four horns.

The Serpent Mound may symbolize a sacred concept. The swellings at the side of the head may represent the horns of the "horned" serpent; the inner circle may typify the sun; the central altar of burned stones may have been used for ceremonial fires; and the forward projection may symbolize the serpent's tongue.

The Museum's model of the Great Serpent Mound was recently renovated and repainted by L. L. Pray, and has been reinstalled in the Hall of North American Archaeology (Hall B).

A PERUVIAN FISH POISON

BY LLEWELYN WILLIAMS

Assistant Curator of Economic Botany

To forest inhabitants of northeastern Peru, the dominant problem is the quest for food. Their principal source of starch is manioc or cassava, and their protein is obtained mostly from fish.

Fish are captured usually with hook and line, in hand nets made of palm fiber, with large nets thrown across a stream before the rivers rise, with bows and arrows, by spearing, or with cleverly designed fish traps. But the most common method is through poisoning the water.

Several species of trees, shrubs and herbs possessing toxic properties serve this purpose, but the most powerful and generally used one is an evergreen shrub (*Lonchocarpus nicou*) of the pea family. In Peru this shrub is known as barbasco, a general term for fish poisons in Spanish America, or as cube (pronounced coo-bay). In Surinam it goes by the name of nekkro and in British Guiana is called haiari. This shrub, which after three or four years becomes a semi-climber, occurs wild but is also cultivated. It appears to flower seldom. Propagation is obtained by planting pieces of the stem.

The roots, measuring up to ten feet in length, contain a large quantity of highly poisonous latex. Its use as a fish poison is prohibited by law, but in areas remote from administrative authorities, this primitive custom persists among both Indians and Peruvians.

Roots from two to four years old are used. These are ground to a creamy pulp. An

alternative method is to cut the roots into small pieces, place them in a canoe, and cover with water. The fishermen then stamp on the mixture with their feet until a grayish liquid is produced. A lagoon or stream with little or no current is selected. Across it is built a weir of strong straight stakes and palm leaves, to form a pool into which the barbasco is thrown. After a few minutes the poisoning or paralyzing effect upon the fish becomes apparent. The smaller fish rise to the surface and die. Soon the larger fish are affected. They may be seen jumping out of the water and the fishermen secure them in outspread palm leaves, in nets or by spearing them. Curiously enough, the poisoned fish may be eaten with perfect impunity.

In the Andean highlands the same latex is applied as a wash to kill ticks on cattle, and recently it has attracted attention as an insecticide.

DOMESTICATED CHEETAHS

The cheetah or hunting leopard, although a member of the cat family, the large members of which are notoriously treacherous, was nevertheless one of the earliest semi-domesticated animals and pets of man. Ancient records and pictures show that Cleopatra had cheetahs for pets and played with them boldly; and that the Romans and Egyptians led them like dogs, on leashes, and used them for hunting game.

The cheetah differs greatly from other members of the cat family. It has long legs and dog-like feet with non-retractile claws. Because of its amazing speed it is often referred to as the "greyhound of the cats." It illustrates the principle of evolution that animals which run fast tend to reduce their toes and claws, as exemplified so strikingly by the horse which in prehistoric times had four, then three toes, and has gradually evolved into the one-toed or hoofed animal of today. The cheetah is a native of Africa, India, and southwestern Asia. A group of male, female, and young, mounted by Carl E. Akeley, is on exhibition in Carl E. Akeley Memorial Hall (Hall 22).

The cheetah has a slender, lithe body, and is extremely skillful in stalking animals upon which it preys. Cheetahs are still tamed by natives of India, who use them in hunting antelope. They become quite attached to their masters, but one cannot be too certain of their affections. When used for hunting they are carried blindfolded to the vicinity of the game, to prevent them from starting off too soon. When the game is sighted the bandages are removed, and the cheetahs rush with incredible swiftness upon their victims.

Pele's Hair

A specimen of Pele's hair from the volcano, Kilauea, in Hawaii, has been added to the volcanic collection in Clarence Buckingham Hall (Hall 35). It is a tangled mass of brown fibers spun from volcanic glass and closely resembles human hair. Pele, after whom the specimen is named, was the Hawaiian goddess of the volcano. She was supposed to live in the crater of Kilauea and to emerge from time to time.

The hairs are threads of volcanic glass spun from the molten lava of the crater. The lava in the crater, in violent ebullition, throws up jets of liquid lava. Steam, escaping violently from these jets, projects into the air particles or shots of the viscid lava which, as they travel, trail behind them thin glassy threads like tails. These are the threads of Pele's hair.—H.W.N.

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 or 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—29 herbarium specimens, Mexico; from Rev. Bro. G. Arsène—2,702 herbarium specimens, New Mexico; from Professor Jacques Rousseau—24 herbarium specimens, New Mexico; from Miss Caroline C. Haynes—20 herbarium specimens, New Mexico; from George W. Robbins—a mammoth tooth and a section of a mammoth tusk, Alaska; from J. A. Bauer—a group of quartz crystals, Arkansas; from E. Wyllia Andrews—36 snakes, turtles, frogs, and lizards, a vampire bat, one lot of snake eggs, and one lot of snake embryos, Mexico; from Chicago Zoological Society—4 lizards and 2 snakes, Australia; from the Charleston Museum—14 eastern chain pickerel, South Carolina.

NEW MEMBERS

The following persons were elected to membership in Field Museum during the period from June 16 to July 10:

Associate Members

Arthur Boone, Miss Catharine Colvin

Annual Members

W. S. Agar, Carl M. Black, Dr. Robert Blue, Ossian Cameron, Miss Ruby Fremont, Mrs. Helen E. Henning, W. W. Heinz, James Hoskinson, Mrs. Donald D. McKiernan, Mrs. Mollie Bahr Nieland, Irvin Rooks, John J. Thomas.

PARKING AT THE MUSEUM

As announced in previous issues of FIELD MUSEUM NEWS, facilities have been provided for the parking of the automobiles of visitors to the Museum on the grounds at the west entrance of the building. Attendants are stationed there and at the north side of the Museum to assist visitors. A small charge is made for the parking service.

Fossil Crayfish Nest

A fossil crayfish nest exhibited in Ernest R. Graham Hall (Hall 38) is one of the unusual specimens collected by the Marshall Field Expedition to Argentina. This specimen is a cylindrical form enlarged at the middle, and hollow with both ends open. It is made up of little balls of mud the size of a pea. The mud hardening as it dried formed a secure nest for this animal. The entire mass has been impregnated with silica and is now hard as stone. Certain living species of crayfish in South America are known to make nests in this way. The nest stands upright above the ground and the animal lives just within the entrance.

Field Museum News

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AFRICAN BUFFALO IS ONE OF THE MOST DANGEROUS OF ANIMALS TO HUNT

Groups of four of the principal species of wild oxen living today are on exhibition in Field Museum. Photographs and accounts of three of these great bovines—the American bison, the Indian or water buffalo, and the Asiatic gaur ox or seladang—have appeared in FIELD MUSEUM NEWS at various times during the past few years as these exhibits were installed. It seems appropriate, therefore, to make the series complete in these pages by giving attention to the fourth group—the African buffalo—an older but equally interesting exhibit which is to be seen in Carl E. Akeley Memorial Hall (Hall 22).

The African buffalo, like its Indian cousin, the water buffalo, is a true buffalo, in contrast to the American bison which, while commonly referred to as a buffalo, does not, strictly speaking, so classify. Unlike the Indian buffalo, that of Africa has never been domesticated.

There are several varieties of African buffalo, the cape buffalo of South Africa being the best known. The animals are found over a wide range, however, embracing the greater part of the continent—west, central, south and east. Those in the Museum group are of the East African variety. Aside from the smaller red buffalo of West Africa, the differences in the animals found in the various localities are minor in character.

The group in Field Museum consists of specimens collected by the late Carl E. Akeley on the Field Museum African Expedition of 1905-06, and prepared for exhibition by him a few years later. It is the last piece of work for Field Museum completed by this

famous taxidermist. At the time of its preparation it represented a distinct innovation in museum technique, being the first group to be prepared anywhere by a new process originated by Mr. Akeley. It is still regarded as the most successful work done by this process, in which the skin

buffalo, but the latter is broader in body and perhaps more nearly approaches the weight of the gaur. The American bison, while often attaining great size, is usually smaller than either its African or Asiatic relatives.

The African buffalo is regarded by big game hunters as one of the most dangerous of all wild beasts. Opinion is divided as to whether or not it is more dangerous than the lion, but for making unprovoked charges upon man the preponderance of potential peril probably lies with the buffalo. When wounded this animal will charge with extreme ferocity, and it sometimes even lies in wait for the hunter and makes a vicious charge. The danger is increased by the fact that the buffalo roams in herds up to several hundred, whereas lions are seldom encountered in groups of more than six to ten at the most. Buffalo usually feed in dry upland where there is light

scrub and coarse grass. During the heat of the day they retire to shelter in rushes and heavy jungle. Hunting them in such places is very hazardous.

The horns of African buffalo are very large and heavy, with broad thickened bosses which almost meet in the center of the forehead. The record width of the horns is fifty-six inches.

In color the animal is blackish, but very young or partly grown specimens are frequently reddish brown. The coat is very thin, and in old age may be almost bare.

The Museum group consists of three bulls, a cow, and a young calf.



African Buffalo

This group, the work of the late Carl E. Akeley, with the more recent groups of gaur ox, Indian water buffalo, and American bison, gives the Museum a representation of four important kinds of great wild bovines.

of the animal is modeled directly against clay, then temporarily set in plaster applied to the outside, after which the clay is removed and the supporting manikin built onto the skin from the inside—practically a reversal of the method usually pursued in the mounting of animals. This Akeley innovation is especially adaptable to the preparation of thin haired animals in which it is desired to obtain a flesh-like appearance.

Opinion as to which is the largest of the various great oxen depends somewhat upon the point of view. The gaur ox probably weighs the most, on the average. The Indian water buffalo is taller than the African

preserved in a stratum of peat at Ainsworth, Nebraska, was examined. Two specimens of fossil rhinoceroses were collected for the Museum in the Bad Lands of South Dakota.

Chinese Temple Embroideries

Large and strikingly beautiful embroidered silk panels which once decorated a huge altar in a Lama temple at Peking, China, have been added to the exhibits in Hall 32 (West Gallery). They were collected some years ago by an expedition led by Dr. Berthold Laufer, Curator of Anthropology. The embroideries date back to the K'ien-lung period (1736-95). They are decorated with elaborate symbolical pictures. Included in the designs are peaches of Paradise, believed to confer immortality

on anyone who ate them, and bats symbolizing the blessings of old age, wealth, health, virtue, and natural death. Shown with the panels are streamers or pennants embroidered with elaborate floral sprays. These were suspended from the ceiling of the temple, and hung down in front of the altar to hide an image from direct view.

Botanist from Africa at Museum

Dr. E. P. Phillips of the National Herbarium, Pretoria, South Africa, spent several days as a visitor at Field Museum at the end of July. Dr. Phillips, under grants from the Carnegie Corporation and certain South African organizations, is making a study of the botanical institutions of the United States.

Change in Visiting Hours

Field Museum visiting hours, which have been 9 A.M. to 6 P.M. daily during the summer months, will change to the autumn schedule—9 A.M. to 5 P.M.—on Tuesday, September 4, the day after Labor Day. These hours will continue until October 31. On November 1 the winter hours, 9 A.M. to 4:30 P.M., will go into effect, continuing until March 31. During this period, however, the Museum will be open until 5 P.M. on Sundays.

Fossil Rhinoceroses Collected

A number of fossil-bearing localities were visited in July by Associate Curator E. S. Riggs of the Department of Geology. A deposit of Mastodon and camel bones

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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H. B. HARTEManaging Editor

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, 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.

CHILDREN PROVE VALUE OF MUSEUM EDUCATION

How Field Museum has become established in the esteem and affections of the school children of Chicago is well exemplified in testimonial booklets prepared by seventh and eighth grade pupils of the Mozart Public School which have been forwarded to the Museum. In these the children have expressed in their own words the appreciation they feel for the traveling exhibits sent to them by the N. W. Harris Public School Extension of the Museum and for the motion picture programs, lectures and other activities conducted for them by the James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures.

These little books, written in the children's handwriting, many of them illustrated with drawings, and bound in ornate colored paper covers of various kinds, not only express the children's gratitude, but bear eloquent witness to the value of the activities conducted by the Museum for the education of children in the natural sciences. Each of the books contains from seven to twenty-seven compositions by the children describing what they have learned from the Museum about animals, plants, minerals, and industrial products.

MUSEUM RECEIVES KING COBRA FROM FRANK BUCK

A large and rare specimen of king cobra from India, some fourteen feet in length, has been presented to Field Museum by Frank Buck, collector of live wild animals, author of "Bringing 'Em Back Alive," and producer of animal motion pictures. This great snake was one of the largest known of its species, and had been on exhibition in Mr. Buck's collection at A Century of Progress where it finally died after resisting all attempts to feed it. The king cobra is probably the most dangerous of all venomous reptiles, and hitherto has been unrepresented in the Museum's collections. Preparations are being made for using this specimen as an exhibit.

Additions to Library

Several important additions have recently been made to the Library of the Museum. One of these is a copy of *Malekula* by Arthur B. Deacon, a young man who lived among these people of the New Hebrides for a time and learned much about them. They are a tribe which is rapidly becoming extinct.

Thirty-eight books containing valuable material on the culture of China have been received as a gift from The American Friends of China, Chicago. These make a useful supplement to the many books on China presented by this society at various earlier times.

Other books recently added to the Library include Brown's *Archaeology of Mississippi*, the second volume of Peters' *Check List of the Birds of the World*, and Peterson's *Field Guide to the Birds*.

2,700 Plants from New Mexico

The most important accession of botanical material received by Field Museum during the first half of 1934 consists of 2,700 specimens of plants from New Mexico, presented by Reverend Brother G. Arsene of Santa Fe, who collected them. Brother Arsene is well known for his collections of Mexican plants, perhaps the most extensive ever obtained in Mexico by a single collector. Of these, also, the Museum possesses

several thousand specimens. Brother Arsene's generous gift of the present year gives the Herbarium an excellent representation of the highly varied flora of northern New Mexico, and includes material of many rare and exceptionally interesting plants.

INDIAN TOWN OF ORAIBI IS OLDEST IN U. S.

By PAUL S. MARTIN

Assistant Curator of North American Archaeology

St. Augustine, Florida, was settled about 1565; Santa Fé, New Mexico, about 1537. Citizens of each of these claim that their city is the oldest in the United States. But never does one hear of a chamber of commerce of the Indian town of Oraibi, in the Hopi Reservation, Arizona, contending that the title of "oldest town" belongs to that settlement. Nevertheless, Oraibi is the oldest continuously inhabited community in the United States so far recorded.

Recent archaeological work at that site clearly indicates that the present pueblo or town is erected on top of older habitations which were built, lived in, and deserted many centuries ago.

According to tribal legends, Oraibi was founded as the result of a quarrel between two factions of another village, now abandoned. Probably this schism was a result of that age-old battle—the young versus the old. In historic times quarrels between the young and the old of a village have often resulted in the founding of another settlement. At any rate, Oraibi probably dates back to about A. D. 1200. Thus, it is well over 300 years older than any other town in the United States.

AFRICAN LEATHER WORK

Most African tribes have a knowledge of dressing hides by soaking, scraping to remove the fat and hair, then making the leather into simple loin coverings, quivers, or the tops of stools.

In north Africa (especially Morocco), in Saharan centers, and in large market towns of west Africa, leather work is a major occupation, with an elaborate technique which owes nothing to European invention, although in recent years certain European styles have been copied. In these regions tanning, sometimes with preparations made from acacia bark, and the making of dyes from native plants, one of which is the borassus palm, have been developed to a high degree of perfection by skilled artisans.

Saddle covers, horse trappings, sandals, scabbards for swords and knives are shown in Hall D. The case most recently added displays the best work of Nigerian craftsmen, and an interesting series is that showing the making of a pair of sandals which were manufactured in Kano market, northern Nigeria. The collection was made by the Frederick H. Rawson-Field Museum Expedition, 1929-30.

Swiss Scientist Studying Here

Dr. Charles Baehni, of the Conservatoire Botanique, Geneva, Switzerland, arrived in Chicago toward the end of July. Through a cooperative arrangement between the Swiss institution and Field Museum, initiated through the courtesy of Dr. B. P. G. Hochreutiner, director of the conservatory, Dr. Baehni expects to spend a year in study at the Museum.

The prow and stern ornaments of a ceremonial canoe, exhibited in Joseph N. Field Hall (Hall A), illustrate the care and skill exercised in their work by natives of South Sea islands.

MATÉ

By B. E. DAHLGREN

Acting Curator, Department of Botany

To the exhibit of food plants in Hall 25 there has recently been added a case devoted to the plants furnishing the common, mildly stimulating beverages that constitute an important part of our daily food and drink, such as coffee, tea and cocoa, as well as various less familiar ones belonging in the same category, such as cola, guaraná and maté.

The various source plants of all of these have little or no close botanical relation to each other, with the exception of cola and cacao which both belong to the same plant family. However, the one characteristic common to all of these plants is the presence in them of a stimulating alcaloid of the caffeine group—either caffeine, theine, theobromine or guaranine, or a combination of these. It is, of course, this which is responsible for their use and wide popularity.

Coffee, tea and cacao are so well known that they need no special comment in this connection. Guaraná and its use by the Indians of the Amazon and Matto Grosso region were described in the June issue of FIELD MUSEUM NEWS. The North American Indians were acquainted with the stimulating properties of the leaves of cassina and some other shrubs of the holly family native in the eastern and south-eastern United States, but, though well enough known, cassine tea appears never to have been very important. On the South American continent, however, another member of the holly family, maté or matte was found in common use among the aborigines of the Pampas region and is said to have been known even to the Incas of Peru. It has remained in use ever since, and with the increase in population during the last few hundred years has become so important that it may well be called the principal beverage of the millions of inhabitants of Argentina, Uruguay and southern Brazil, as well as of Paraguay, Bolivia and Chile. In a region where the ordinary diet consists so largely of meat, as is the case in the cattle country of South America, the popularity of maté is probably not to be attributed solely to its stimulating effects, but also to the fact that it is the source of some of the essential vitamins.

A shrub or small tree, often compared in appearance to an orange tree, maté grows wild in the woods of the high lands on both sides of the Alto Parana river which forms the boundary between Paraguay and the southern states of Brazil. The leaves of the trees are obtained by chopping off branches, sometimes of considerable size, from which later the smaller branches and twigs are collected, made into bundles and carried into camp. The green branches are then roasted over a fire, laid aside to "sweat" for some time and later again subjected to a fire to dry them. The dried and stiff leaves are finally separated from the branches by beating. Next they are broken into small fragments in a wooden mortar or by a machine especially designed for the purpose, and packed tight into sacks or into green rawhide bags which in drying and shrinking still further compress the leaves, making cushion-shaped packages hard as rock. The harvest is then ready for transportation to the commercial centers. Much of the harvest goes down the Parana river to La Plata and Buenos Aires, but fully three-quarters of the 200,000 tons gathered yearly originates on Brazilian territory and is distributed from there.

While most of the supply still is obtained from trees growing wild in the woods, the planting of maté, once practised by the Jesuit rulers of Paraguay, has recently been undertaken on an extensive scale, especially in Argentina where the plant is known as *yerba matte*, or often simply as *yerba*. The corresponding Brazilian name is *herva matte* or *matte plant*. *Matte* is the Indian name for the small gourd or calabash in which the infusion of the broken leaves is prepared in rural districts to the present day. Thus the meaning of *herva matte* becomes "plant for the gourd." It is prepared in the same way that tea is brewed. A pinch of leaves, as much as may be picked up with thumb and finger, is placed in the calabash, and the vessel is filled



Maté

Brewed like the Oriental teas, the leaves of this plant make a popular beverage in South America.

with hot water. It may be refilled with water several times without further addition of leaves, as the content is consumed. The hot liquid is generally taken through a straw or tube, called *bomba* or *bombilla*, often made of silver and supplied with a bulbous strainer at its lower end. In the cattle country where people live an outdoor life, and where crockery is scarce or inconvenient to carry about, the gourd is passed from hand to hand, and strangers who would ordinarily not think of drinking from another's cup, on meeting take their maté without hesitation from the same *bombilla*. In ordinary domestic use maté is taken with sugar and cream or lemon.

PARKING AT THE MUSEUM

As announced in previous issues of FIELD MUSEUM NEWS, facilities have been provided for the parking of the automobiles of visitors to the Museum on the grounds at the west entrance of the building. Attendants are stationed there and at the north side of the Museum to assist visitors. A small charge is made for the parking service.

Sea Urchin Exhibited

Sea urchins excavate retreats for themselves in the solid rock along the Brazilian sea coast. A sea urchin and its hole are exhibited in Clarence Buckingham Hall (Hall 35).

A hammock of the type in which nearly all Amazonian Indians sleep, made of palm fiber strings, is exhibited in Hall 9.

PIGEON WHISTLES

By BERTHOLD LAUFER

Curator, Department of Anthropology

The Chinese have trained carrier pigeons for more than a thousand years, but never on a large scale or intensively. However, they have added to the art of pigeon-training an attractive means of amusement. As they were the first who communed with the air by means of kites, they also were the first who created "music on the air," long before anyone ever dreamed of such a thing as radio. This was accomplished by means of whistles, extremely light in weight, attached to the pigeon's tail-feathers. These whistles consist of two, three, or five reed tubes of graded length in the shape of a Pandean pipe, varnished yellow, brown, or black; or of a small gourd into which reed pipes are inserted.

A complete collection of these whistles, some engraved with the names of the makers, is on view in a case illustrating the musical instruments of China in Hall 32 on the West Gallery. There also may be seen a mounted pigeon outfitted with the whistle, and photographs of live pigeons thus equipped, taken in Peking.

The whistles are fastened to the tail-feathers of the birds while they are still young. When a flock of pigeons flies up, the wind strikes the apertures of the instruments, sets them to vibrating, and produces a not unpleasing open-air concert the charms of which are heightened by the fact that the whistles used in the same flock are tuned differently.

The Chinese explain that the sounds of the whistles are intended to keep the flocks together, and to protect the birds from onslaughts of hawks and other birds of prey. This rationalistic interpretation, however, is not convincing. It is not known, and seems at least doubtful, whether such music makes an impression on either pigeon or hawk, and whether it would really prevent famished pirates of the air from making a swoop at their quarry. Even supposing that this might happen once in a while, we must consider that this music constantly fills the atmosphere year by year, and the unrelenting foes of the pigeon would gradually become accustomed to it and disregard it.

It seems more plausible that this quaint custom has no rational origin, but is rather the outcome of purely emotional and artistic tendencies. It is not the pigeon that profits from the aerial music, but the human ear that feasts on the wind-blown tunes and derives esthetic enjoyment from them. On a serene day one can hear this concert in Peking all day even in one's house. The pigeons which fly about with whistles attached to them are termed poetically "mid-sky beauties."

Stylolites

Lines running in a most eccentric way, with many sharp angles, may be observed on the surface of many limestones and marbles. These are the traces of bands of thin columns which run through the stone and resemble miniature palisade fences although no fence would pursue so irregular a course. They are named "stylolites" after Saint Simeon Stylites who is reputed to have lived for many years on the top of a column. Indiana quarrymen call them "Devils' Toe Nails." Examples are shown in Clarence Buckingham Hall (Hall 35).

The entire bark of a cork oak tree, as it appears when stripped from the trunk, is exhibited in the Department of Botany.

ANIMAL BOOKS FOR CHILDREN AVAILABLE AT THE MUSEUM

The first four of a series of small books about animals for children, illustrated with "three-dimensional" pictures of habitat groups in Field Museum, have just been published. These are known as "The Footprint Series," referring to the page borders which contain sketches of the footprints of the various animals, as well as silhouette drawings showing them in characteristic actions. Each book contains several large pictures of Museum groups printed by the "Orthovis" process which makes them stand out and appear to be in three dimensions when they are seen through the "Ortho-scope," an optical device which accompanies each copy.

Titles of the books published so far are "The Lion," "The Bear," "The Deer," and "Wild Sheep and Goats." Each contains a brief story giving some of the principal facts about the animals, written in a style suited for reading by children from about eight to fourteen years old, or for reading to younger children. The texts are by H. B. Harte of Field Museum staff. The books are published by The Orthovis Company, Chicago, and are sold at Field Museum at 25 cents per copy or \$1.00 for the set of four titles. On mail orders to the Museum an additional remittance of 3 cents per copy for individual books, or 10 cents on orders for the set of four, is required to cover postage.

TERNS AND PIGEONS EXHIBITED

With the recent installation of an exhibit of terns (or sea swallows) and pigeons of various species, the systematic collection of North American birds in Hall 21 is approaching completion. Only one more case now needs to be prepared in this important ornithological series.

Of special interest in the case of terns and pigeons is a specimen of the celebrated Arctic tern, champion of all migrating birds, which annually each autumn flies some 22,000 miles from its summer home in the Arctic regions to its winter quarters in the Antarctic, and returns over the same long course in the spring. The Caspian tern, largest of the tribe, and the least tern, almost exterminated by hunters who sought its plumes for millinery, are represented. Other terns in the exhibit include the common, noddy, Forster's, Cabot's, royal, Aleutian, roseate, gull-billed, and black. Also shown is the black skimmer.

Among the pigeons is represented the now completely extinct passenger pigeon, another victim of those who hunted it because of its market value for use as food. Other pigeons shown are the red-billed, band-tailed, mourning dove, white-winged dove, ruddy quail-dove, eastern ground dove, Mexican ground dove, Zenaida dove, Inca dove, and white-fronted dove. Several of these are almost tropical, but are included among North American birds because a few are found just over the southern borders of America. The exhibit was prepared by Staff Taxidermist Ashley Hine.

A CURIOUS SIGNAL LAMP FROM MADAGASCAR

Lamps as signals have long played an important part in life. There was, of course, the historic lantern hung in the steeple of North Church, Boston, which sent Paul Revere on his famous ride. There are the beacon lamps of today which signal safety or danger to the mariner, the railroad man, and the airman. Many other instances

of important lamps could be cited from actual life and from literature.

A novel use of a signal lamp was that devised by one of the last kings of the Betsileo tribe in southern Madagascar, whereby he was able to call any one, or several, of his wives for company; to summon his chieftains for counsel; or to inform wives, counsellors, and all other persons that he craved solitude. The royal lamp thus used was obtained by the Marshall Field Anthropological Expedition to Madagascar, and is now part of the collection on exhibition in Hall E.

According to Dr. Ralph Linton who led the expedition, the king lived alone in a one-room house, in the center of an enclosure containing other houses occupied by his wives. The royal lamp consists of a tripod-like stand from which are suspended series of cups which were filled with grease, and each of which contained a wick. Each cup was identified with a certain person. There is one cup by itself at the top of the stand. This denoted the king himself, and when lighted indicated that his majesty was not to be disturbed by any one. A short distance below are four cups, one for each of the chiefs of the four main clans of the tribe. The king called one, several, or all of these men by lighting the lamps of those he wished to see.

Farther down on the stand is a tier of five more cups, indicating the wives. None of the wives dared approach the king unless her special cup was lighted. If there was a jealous woman among them, one may well imagine her feelings at seeing another cup lighted, and not her own. Or, hastening in answer to a summons in her own, and then seeing another wife's cup flame up at the same time.

So far as could be learned, however, they were remarkably obedient wives, and the king's wishes were always solemnly respected. The king, of course, had no matches, and had to light his lamp with flint and steel, or by the primitive method of rubbing sticks together until the friction brought fire.

Entomologist from Canal Zone

A recent visitor at Field Museum was James Zetek, well known entomologist of the Panama Canal Zone, to whose interest and activity are due primarily the success of the Laboratory for Tropical Research on Barro Colorado Island. A new trail on this island has been named for Associate Curator Paul C. Standley of the Department of Botany, who published last year an account of the plants known to occur on the island.

Interesting Mammoth Tooth

Unusual interest attaches to the tooth of a mammoth presented to the Museum by George W. Robbins of Valdez, Alaska. It is part of a mammoth carcass, including skin and hair which had been preserved in the frozen gravels of northern Alaska. It was encountered during gold-mining operations in the Fairbanks District. The stream of water under high pressure employed to loosen the gravel destroyed most of the body before it was discovered by the miners.

Botanical Congress Calls Standley

Associate Curator Paul C. Standley of the Department of Botany has been invited to act as Vice-President of the Section for Taxonomy and Nomenclature of the Sixth International Botanical Congress, to be held at Amsterdam in September, 1935.

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:

Week beginning September 3: Monday—Labor Day holiday, no tour; Tuesday—General Tour; Wednesday—Peoples of the Far North; Thursday—General Tour; Friday—Habitat Groups.

Week beginning September 10: Monday—Chinese Exhibits; Tuesday—General Tour; Wednesday—Hall of Prehistoric Life; Thursday—General Tour; Friday—Plants and Their Uses.

Week beginning September 17: Monday—Birds of Unusual Interest; Tuesday—General Tour; Wednesday—Egyptian Exhibits; Thursday—General Tour; Friday—Fish, Amphibians and Reptiles.

Week beginning September 24: Monday—Ores and Minerals; Tuesday—General Tour; Wednesday—Peoples of the Stone Age; Thursday—General Tour; Friday—African Game Animals.

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 the principal gifts received during the last month:

Miss T. Duke—9 ethnological objects, Rio Grande river bank; from Rev. Bro. Elias—72 herbarium specimens, Colombia; from School of Forestry, Yale University—91 herbarium specimens, Colombia; from Dr. Earl E. Sherff—190 herbarium specimens, Hawaii; from Mrs. Ynes Mexia—300 herbarium specimens, Peru and Brazil; from Professor Emanuel Fritz—2 fruiting branches of redwood and western red cedar, California; from T. Fujiwara—2 samples of oak; from Thomas Birks—a tiger salamander, Wisconsin; from Dr. Orlando Park—5 beetles, Illinois; from J. W. Sugden—11 moths, Utah; from H. M. Bower—2 aphid moths and 2 butterflies, Utah and Wisconsin; from Mrs. Florence R. Standley—3 bugs, Florida; from John L. Sperry—8 aphid moths, California; from E. Wyllys Andrews—15 entomological specimens, Yucatan; from Dr. Florentine Felippone—a red bat skin, Uruguay; from Miss Phyllis Laybourne—a red-backed salamander, Indiana; from Dr. J. F. W. Pearson—13 frogs and toads, Florida; from General Biological Supply House—3 snakes and 5 lizards, California; from Homer Forbis—4 sand wasps, Missouri; from Frank Buck—a king cobra; from Caribbean Biological Laboratories—a South African lizard and 5 Australian tree frogs.

NEW MEMBERS

The following persons were elected to membership in Field Museum during the period from July 11 to August 11:

Associate Members

Burridge D. Butler, Mrs. C. Frederick Childs, Roy Massena.

Sustaining Members

Harold M. Florsheim

Annual Members

O. Helge Anderson, Mrs. J. W. Blythe, Mrs. H. C. Briney, Mrs. Henry Lee Buswell, Bayless W. French, Mrs. Martin M. Gridley, Mrs. Burt C. Hardenbrook, W. Homer Hartz, Samuel N. Lebold, Mrs. Martin Lindsay, Edward D. Loring, Ralph H. Martin, Leland K. Neaves, Harry Rich, Robert W. Schupp, Mrs. Trigg Waller, Dr. Virgil Wescott, W. T. White, Mrs. Charles Pratt Whitney.

Shelled Animals Resist Extinction

Hard-shelled animals are long-lived but slow of movement and little given to change. Turtles have been turtles for 150,000,000 years. Armadillos have rolled up into balls and have "dug in" for protection during 40,000,000 years. The great South American glyptodonts were traveling citadels of self-protection for an even longer period. Animals lacking such defenses are exposed to every passing danger—their species arise and become extinct while the shell-protected ones hold on.

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GROUP SHOWS CARICATURE-LIKE PROBOSCIS MONKEYS IN TREETOP HABITAT

BY WILFRED H. OSGOOD

Curator, Department of Zoology

The proboscis monkey, as its name implies, is a monkey with a very long nose—so long, in fact, and so brightly colored, that it gives the animal a very grotesque appearance, like a caricature. The nose is some three or four inches long in full-grown males, and is probably only a pendulous ornament of no particular service to the animal in its daily economy. At least that is all it is safe to say, for observations on the animal's habits are scanty.

Aside from its nose, the species is also distinguished among the simian tribe by its rather large size and its lively coloration. Its body is bright rufous, while its limbs, tail and under parts are pale buffy in considerable contrast. The face and nose are naked and bright pink. In the green trees which it inhabits this coloration must make it a very conspicuous object. With the exception of the great apes, it is one of the largest monkeys, only a few other species being equal to it. If it stood erect it would doubtless exceed four feet in height. Alfred Russel Wallace, who mentions it in his classical work, *The Malay Archipelago*, compares its size to that of a three-year-old child.

The great island of Borneo is the exclusive habitat of this monkey. This, it may be remembered, is also the home of the orang and some other peculiar mammals. The orang, however, extends to the adjoining island of Sumatra, whereas the proboscis monkey is strictly limited to one island. Just why this is so is a problem in distribution of a kind common enough to zoologists, but not easy to solve with exactness. No doubt this monkey reached Borneo previous to the separation of the island from the Asiatic mainland, but the peculiarities the

animal has developed seem to indicate that it has been isolated for quite a long time. If its whole history could be known, it would doubtless be an interesting one.

Perhaps the proboscis monkey's nearest relative is the golden or snub-nosed monkey of central China, which also has bright colors and a nose which, although short,

other monkeys. It is very elongate, and incompletely divided into several sacklike compartments.

Proboscis monkeys are inclined to be gregarious, being usually found in troops. They spend most of their time in the tops of tall trees, and rarely come to the ground. They seem to be most abundant near the

banks of water courses and estuaries, and nearly all travelers to Borneo report having seen them in such places. Certain trees such as the one called podada are frequented by them more than others, perhaps because of some food preference. Probably they eat leaves and young shoots as well as fruits and berries, but their exact habits are unknown. Largely for this reason, feeding them in captivity is not always successful, and they are rarely seen in zoos or menageries.

A group of proboscis monkeys, including several adults and young, was among the earliest of the zoological exhibits of Field Museum. This was prepared by Carl E. Akeley, and stood for many years in the building in Jackson Park formerly occupied by the Museum. Recently the group has been reinstalled and rearranged to occupy an appropriate space in William V. Kelley Hall (Hall 17) of the present Museum building. This has been accomplished very successfully by Staff Taxidermist Leon L. Pray,

who has regrouped the animals, painted a suitable background, and, with the assistance of Frank Lett, has reproduced an entire treetop scene with artificial branches, leaves and vines. The mounted animals required but little change except in position and are in excellent condition. They formed part of a considerable collection from Borneo obtained by C. F. Adams, and purchased for the Museum by the late Martin A. Ryerson.



Proboscis Monkeys

These inhabitants of Borneo, with their long comical noses, rank among the queerest of simians. They are conspicuous also for their large size and striking coloration. Group in William V. Kelley Hall.

is turned upward and peculiar in shape. Moreover, it also is a monkey of large size. Both species belong to the group collectively known as langurs, the most familiar species of which is the holy ape of India. All the monkeys of this group are especially distinguished by their strictly herbivorous diet. Their digestive apparatus is especially adapted for vegetable food, the stomach particularly being unlike that found in

Two Curators Appointed

In recognition of the capable and efficient manner in which they have administered their respective Departments, the Board of Trustees of Field Museum, at its meeting held September 17, approved the appoint-

ment of Acting Curator B. E. Dahlgren as Curator of the Department of Botany, and of Acting Curator Henry W. Nichols as Curator of the Department of Geology. The appointments are effective as of October 1.

Professor Noé in Mexico

Professor A. C. Noé, Research Associate in Paleobotany of Field Museum, and paleobotanist of the University of Chicago, was in Mexico City last month making studies of type fossils of Liassic plants.

Field Museum of Natural History

Founded by Marshall Field, 1893
Roosevelt Road and Lake Michigan, Chicago

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FIELD MUSEUM NEWS

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

CONTRIBUTING EDITORS

BERTHOLD LAUFER * Curator of Anthropology
B. E. DAHLGREN Curator of Botany
HENRY W. NICHOLS Curator of Geology
WILFRED H. OSGOOD Curator of Zoology
H. B. HARTE Managing Editor

*Deceased September 13, 1934

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, 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 DEATH OF DR. LAUFER, CURATOR OF ANTHROPOLOGY

The tragic death of Dr. Berthold Laufer, Curator of the Department of Anthropology, has taken from the staff of Field Museum, and from the roster of the world's scientists, one of the greatest of contemporary scholars.

Dr. Laufer, who for months had been afflicted with severe illness, and had recently undergone a dangerous chest operation, died on September 13 in a fall from an upper story of the Chicago Beach Hotel, which had been his residence.

An eminent authority on practically all phases of the science of anthropology, Dr. Laufer had for many years specialized on researches in Oriental archaeology and ethnology, and had gained

world-wide recognition and fame in those branches. It is doubtful if any other white man ever penetrated so deeply into the psychology and the philosophies of the peoples of China and Tibet. He understood these peoples as few of their own race could. He pierced the veils of mystery and mysticism with which the yellow race had been surrounded in the minds of most Caucasians, and humanized our knowledge of the Mongolian peoples. He was steeped in the literature of the Orientals through all the centuries from their first discovery of means to record their thoughts. He was versed in all their arts—an unerring and incomparable judge of what was genuine and fine among their products, and what was dross. He was a vital influence in bringing about more widespread appreciation in this country of the creations of Oriental genius, and in establishing a sympathetic understanding of the yellow race.

So familiar was Dr. Laufer with the history of the peoples of the Far East, even in its most obscure chapters, that many things blazoned forth in the present-day world as strictly modern and original accomplishments of the twentieth century and western civilization were to him very old and but a repetition or development of ideas first born hundreds and sometimes thousands of years ago in the minds of yellow men. Thus, in his conversation, and in his voluminous writings, there was present always a delightful charm as he drew striking parallels from ancient civilizations to show that much of contemporary thought, invention, and "progress" was actually not new at all. He wrote a great number of learned theses which, unlike similar works of many scholars, were always in interesting and readable style, and marked by an undercurrent of quiet humor. From the vast depths of his esoteric knowledge he upset, with quaint narratives and facts gleaned from little-known sources, many a set and smug notion of a too self-satisfied generation. To a world in which knowledge of aviation generally dated little further back than the Wright brothers, he showed that flying had been thought of and attempted for centuries in China, Persia and elsewhere, and was able to write an entire volume on the subject. The idea of television, still awaiting perfection by modern engineers, he proved had germinated centuries ago in Oriental minds.



Berthold Laufer

Even such a problem as air conditioning of homes and other buildings, which only recently has come to receive prominent attention in this most progressive and mechanized of nations, not only was considered but was actually solved by the ancient Chinese, Dr. Laufer demonstrated—not, to be sure, by the intricate methods now pursued, but nevertheless in an effective manner. And so through the whole gamut of ideas governing every phase of life—political and social organization, artistic and mechanical creation, religious concepts, and other divisions of human thought and endeavor—Dr. Laufer found in ancient records of other peoples parallels which had anticipated much of what is now regarded as new.

In greatest degree to the work of Dr. Laufer does Field Museum owe its fame as a repository of one of the most extensive and valuable of Oriental collections. As leader of important expeditions for this institution, Dr. Laufer was able to gather comprehensive collections of the finest treasures of China and Tibet, and from his profound knowledge he was able to arrange the display of these in the museum, and the labeling of them, in the most instructive and interesting manner.

A gentle, kindly, patient man, Dr. Laufer was beloved by the members of the staff of his Department. His interest in the younger men working under him was paternal in character, and his influence upon their researches and their writing was vastly felt and deeply appreciated.

Dr. Laufer was born in Cologne, Germany, on October 11, 1874. He was educated at a Cologne gymnasium, the University of Berlin, and the Seminary for Oriental Languages in Berlin. In 1897 he earned the degree of Doctor of Philosophy at the University of Leipzig. He came to the United States in 1898 and soon gained high reputation as an ethnologist and anthropologist. Between 1899 and 1904 he conducted expeditions among the native tribes of Siberia, and in China. For several years he served as a lecturer on anthropology and Asiatic languages at Columbia University. In 1907 he joined the staff of Field Museum and in a short time became Associate Curator of Anthropology. Since 1915 he had been Curator of the Department. In recognition of his important researches and other work he was the recipient of many honors from learned societies, universities, and other scientific organizations.

Dr. Laufer is survived by his widow, Mrs. Bertha Hampton Laufer, and a stepson, Ormond Hampton. Funeral services were held in a south side chapel on September 15, followed by cremation.

Arrow and Spear Heads

Many laymen who are interested in prehistoric arrow and spear heads believe that these implements were chipped or fashioned by heating a piece of stone and then dripping cold water on it. This conception is erroneous. Such treatment would only result in shattered pieces of rock, as any one can verify by experimentation. Such artifacts were chipped by means of pressure flaking, which is done with a bone tool, helped sometimes by a stone hammer. Many examples of stone chipping may be seen in Hall B.

A large black opal, unusually brilliant, about the size of a 25-cent piece in circumference, and weighing fourteen carats, is on exhibition in H. N. Higinbotham Hall (Hall 31).

A NEW COLLECTION OF CULTURE PEARLS

BY HENRY W. NICHOLS

Curator, Department of Geology

The pearl collection in H. N. Higinbotham Hall (Hall 31) has been substantially enlarged by the addition of a collection of culture pearls grown in Japan which was presented by Kokichi Mikimoto of Tokyo to whose years of experiment and study the commercial production of culture pearls is due.

A pearl is a growth in a pearl oyster or other shell fish caused by a persistent irritation of its mantle. There are a number of species of shell fish which produce pearls, but precious pearls are found only in mollusks with pearly shells. Most pearls come from either the pearl oyster of the tropic seas or the fresh water clam, common in the streams of the United States. The persistent irritation of the mantle which causes pearl formation is usually due to the presence of some foreign matter which has entered the shell. It need not be any particular substance, sometimes it is a grain of sand or a fragment of broken shell. Probably in most cases it is the larva of a parasite worm or a minute crustacean. Whatever may be its nature the mollusk endeavors to reduce the irritation by enclosing it in a layer of the same kind of mother-of-pearl or nacre of which the inside of its shell is made. Once started, the covering of nacre continues to grow by the addition of layer over layer until after a lapse of years the minute seed pearl first formed may have grown into a pearl of large size. If the mollusk which secretes the pearl is of a species, such as the pearl oyster or the fresh water clam, which has a brilliant mother-of-pearl shell, the pearl may be lustrous and of great value. But if the pearl is secreted by a mollusk such as the common oyster, which has a comparatively dull shell, the pearl is dull and worthless.

As a natural pearl is a consequence of the accidental introduction of an irritant it would seem that pearls could be cultivated by merely introducing the irritant by artificial means. But the successful cultivation of pearls has proved to be a complicated process accomplished by the Japanese only after years of study and experiment by Mr. Mikimoto. Earlier attempts, of which many had been made, had never succeeded in producing merchantable pearls.

The nucleus of the culture pearl is a small seed pearl or it may be a minute ball of mother-of-pearl or other substance. This is first enclosed in a sac made from the mantle of a pearl oyster. The sac is then carefully inserted in an incision made in the mantle of another oyster and the wound sterilized. This oyster, placed in a culture cage, is allowed to live for several years in the sea. It is then opened and the pearl which has grown around the nucleus removed.

In the new collection of culture pearls there is a pearl oyster with one shell removed which shows the mantle in which the pearl grows. This is followed by a group of five culture pearls illustrating a range in color and luster. Another group of six culture pearls is placed with a group of six natural oriental pearls for comparison. An interesting specimen is a large shell with a dark mother-of-pearl margin and light center. There is a black pearl on the dark portion and a white pearl on the light part to illustrate the influence of the color of the shell on the color of the pearl. Where the mollusk secretes dark nacre for the shell, it secretes dark nacre for the pearl. The collection

also contains two sections, one of a natural and the other of a culture pearl placed under a magnifying glass to show the nuclei and structure of the two kinds of pearl.

JABOTICABA

BY B. E. DAHLGREN

Curator, Department of Botany

An interesting addition to the exhibit of plants of the myrtle family in the Hall of Plant Life (Hall 29) is the jaboticaba, shown in the accompanying photograph.

The jaboticaba tree is a native of the southern states of Brazil, from Rio Grande do Sul to Minas Geraes. In this large area it not only grows wild, but is cultivated also. Its delicious grape-like fruit is pro-



Branch of Jaboticaba

Note how the grape-like fruit grows directly from the stem. An exhibit in the Hall of Plant Life.

duced abundantly in small clusters directly from the thin bark of the trunk and large branches. Rarely, during years of very unusual productivity, the trees may be loaded with fruit even to the smaller branches and twigs. The urchins of the neighborhood where it grows then enjoy a marvelous season. Even in ordinary years they swarm like ants over the jaboticaba trees where the fruit is ripening, and stomach-aches are the order of the day.

The globular fruit has a tough, rather thick skin, enclosing a juicy vinous pulp of excellent flavor and one or more large seeds. It is commonly offered for sale in the markets and is very popular.

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.

HANDBOOK ON THE TREES OF NORTH AMERICA

Under the title *North American Trees* Field Museum has just published a reference book which serves both as a guide to the collections in Charles F. Millsbaugh Hall (Hall 26) of the Department of Botany, and as a handbook for anyone interested in our native trees and their woods. The book contains data on eighty-four of the principal North American trees, including brief botanical descriptions, descriptions of their woods, and summaries of their most important economic uses.

The author is Professor Samuel J. Record, Research Associate in Wood Technology on the Museum staff, and Professor of Forest Products in the School of Forestry at Yale University. Professor Record is well-known as one of the foremost authorities on American woods. Dr. B. E. Dahlgren, Curator of the Department of Botany, is editor of the volume.

The description of each tree is accompanied by an illustration showing twigs, leaves, fruit, cones, seeds, needles, or other such features. The illustrations were furnished by the United States Forest Service. The book is printed by Field Museum Press.

While designed primarily to serve as a reference guide to the collection of North American trees and their woods on exhibition in Millsbaugh Hall, the book is equally suitable as a handbook for use apart from the Museum collections, and is offered as an aid to students, teachers, boy scouts, members of hiking clubs, amateur botanists and others interested in nature study. As far as possible, technical terminology in the text has been supplanted by common words.

The book is on sale at Field Museum for 50 cents per copy. Add 4 cents to cover postage on mail orders.

30,000 PHOTOGRAPHS OBTAINED OF PLANT TYPE SPECIMENS

Up to date more than 30,000 negatives of type specimens of plants preserved in European herbaria have been made under the joint project of the Rockefeller Foundation and Field Museum which has been in operation for the past five years. J. Francis Macbride, Assistant Curator of Taxonomy in the Department of Botany, who has been in Europe in charge of this work during the entire period, returned to this country last month for a visit. He will go back to Europe in January to continue the work of photographing the plant types. Through Field Museum these photographs are made available to botanists generally in the United States and other countries. With them botanists are enabled to make determinations of plants with almost as great ease as if the original type specimens were at hand, where formerly it was almost necessary to visit Europe to make exact identifications. Thus the practical work of systematic botany is greatly advanced by the Rockefeller-Field Museum project. The plants being photographed are chiefly South American in origin.

The famous Harper dried collection of fleshy fungi is in the Herbarium of Field Museum.

The Museum's paleontological exhibits include a large collection of various kinds of fossil corals.

Many of the food and game fishes of Florida and the Gulf coast are exhibited in Albert W. Harris Hall (Hall 18).

AUTUMN LECTURES AT MUSEUM WILL BEGIN OCTOBER 6

The Sixty-second Free Lecture Course to be given at Field Museum will open on October 6. There will be eight lectures on travel and science, illustrated with motion pictures and stereopticon slides, all to be given on Saturday afternoons through October and November. All the lectures will be given 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 6**—In the Cellars of the World
Russell T. Neville, Kewanee, Illinois
- October 13**—Volcanoes of Hawaii
Ray Jerome Baker, Honolulu, Hawaii
- October 20**—New Zealand
M. P. Greenwood Adams, Hackensack, New Jersey
- October 27**—The Philippines Today
James King Steele, San Francisco, California
- November 3**—The Human Adventure
Talking picture sketching man's rise from savagery to civilization
Produced by the Oriental Institute of the University of Chicago with the technical assistance of Erpi Picture Consultants, Inc.
- November 10**—Islands of the Pacific
H. C. Ostrander, Jersey City, New Jersey
- November 17**—Life on the Ocean Bottom and Wonders of the Plant World
Arthur C. Pillsbury, Berkeley, California
- November 24**—The Conquest of Everest
Air Commodore P. F. M. Fellowes, D.S.O., A.D.C., London, England

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 PROGRAMS TO BE GIVEN FOR CHILDREN

The James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures will present nine programs of free motion pictures for children in its fall series which opens on October 6, and continues on Saturday mornings through and including December 1. These entertainments will be given in the James Simpson Theatre of the Museum. Each program 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 6**—Views of Our New Zoo; The Journeys of the Seeds; In the Land of Yaks; Two Cities of Old Cathay
- October 13**—Snake Myths; Columbus Sails West
- October 20**—In Sunny Guatemala; A Beaver Pet; The Story of Coffee
- October 27**—Feeding Time for the Hippos; Rollin' Down to Rio; Under the Southern Cross; Me and My Dog
- November 3**—By Dog-train and Snowshoes; In Canada's Fiords; The Bella Coola Indians; The Romance of Rubber

November 10—From Trails to Rails; The Octopus and Its Cousins; In a Caveman's Home

November 17—Our Animal Neighbors; The Cement Gnomes; Women Workers of Ceylon

November 24—An Arctic Visitor; The Story of the Pilgrims

December 1—The Fall Winds Blow; The Woodchuck Sleeps; A Friend to All the World; Winter Fun

PARKING AT THE MUSEUM

As announced in previous issues of FIELD MUSEUM NEWS, facilities have been provided for the parking of the automobiles of visitors to the Museum on the grounds at the west entrance of the building.* Attendants are stationed there and at the north side of the Museum to assist visitors. A small charge is made for the parking service.

LEAFLET ON CHICAGO WEEDS

The principal weeds of the Chicago region are pictured and described in a new leaflet, *Common Weeds*, just published by the Museum. Twenty-seven different species are covered, and each is illustrated by a photograph plate. The text is the work of Paul C. Standley, Associate Curator of the Herbarium.

This small book should be of special interest at this time of the year when weeds form such a conspicuous part of the vegetation. With it, most of the common weeds of our vacant lots, gardens, and the fields of the country surrounding the city, can be easily identified. The book is a companion volume to four previously published leaflets, namely *Spring Wild Flowers*, *Spring and Early Summer Wild Flowers*, *Summer Wild Flowers*, and *Autumn Flowers and Fruits*, all of which are concerned with the plant life of the Chicago area.

Common Weeds is designed for use as a handbook by those who have gardens, amateur botanists, teachers, students, boy scouts, hiking clubs, and others interested in plants local to the Chicago region. It is on sale at the Museum at 25 cents per copy, plus 2 cents for postage on mail orders.

Picture Portfolio Prices Reduced

Two notable publications, *Taxidermy and Sculpture—The Work of Carl E. Akeley in Field Museum of Natural History*, and *Abysinian Birds and Mammals*, from *Paintings by Louis Agassiz Fuertes*, are now available at Field Museum at drastically reduced prices. The first of these, a portfolio containing 47 photogravures of Akeley's work, which has been selling at \$1.00 per copy, and when originally published several years ago was sold at \$2.00, may now be purchased for 50 cents a copy. The other, a portfolio of 32 colored reproductions of Fuertes' paintings, originally sold at \$3.00 per copy, is now available at \$1.50; the deluxe edition in fabrikoid binding, formerly sold at \$5.00, is now priced at \$3.00. On mail orders the cost of postage must be added to the above prices; this varies according to destination and may be learned by inquiry to the Museum.

Chinese Imperial Robes

Gorgeous robes, head-dresses, beautiful belts with jade buckles, and other items of clothing once worn by emperors, empresses, princes and princesses of the Manchu dynasty in China, are on exhibition in Hall 32.

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 1: Monday—Migratory Birds; Tuesday—General Tour; Wednesday—Hall of Plant Life; Thursday—General Tour; Friday—South America.

Week beginning October 8: Monday—Races of Mankind; Tuesday—General Tour; Wednesday—Crystals, Economic and Decorative; Thursday—General Tour; Friday—Animal Life of North America.

Week beginning October 15: Monday—Egypt and Its Art; Tuesday—General Tour; Wednesday—American Archaeology; Thursday—General Tour; Friday—Africa and Madagascar.

Week beginning October 22: Monday—Pewter and Jade; Tuesday—General Tour; Wednesday—Marine Life, Past and Present; Thursday—General Tour; Friday—Chinese Art.

Week beginning October 29: Monday—Woods and Wood Products; Tuesday—General Tour; Wednesday—Moon and Meteorites.

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 Zachary Taylor—2 excellent examples of leather shadow-play figures, Siam; from Carl Buhl—203 herbarium specimens, Illinois, Indiana, Tennessee and Wisconsin; from Atlas Brewing Company—11 samples of beverages; from James Zetek—147 herbarium specimens, Canal Zone; from William A. Schupp—190 herbarium specimens, British Honduras; from Dr. E. E. Sherff—9 herbarium specimens, Hawaii; from Lionel Distilled Products, Inc.—12 samples of distilled and fermented beverages; from J. O. Shead—9 barite rose specimens, Oklahoma; from Carroll Lane Fenton—17 invertebrate fossils and geological specimens, Iowa; from Kokichi Mikimoto—a collection of culture and oriental pearls, Japan; from Gordon Pearnall—a lesser yellowlegs and 5 snakes, Illinois; from Mrs. Marie Fennema—a small brown bat, Illinois; from Eduardo F. Acosta y Lara—3 bat skins with 4 skulls, Uruguay; from Caribbean Biological Laboratories—a red bat, a muskrat, and a rabbit, Mississippi; from James McLaren—a red bat, Illinois; from R. Marlin Perkins—7 snakes, Brazil and Guatemala; from Bertha Cramer—a silver-haired bat skeleton, Illinois; from Leslie Wheeler—an eagle, 9 hawks, and 3 owls, Korea; from Walter L. Necker—a pilot black-snake, Indiana; from Henry Dybus and Floyd Wiercinski—a rattlesnake, Indiana; from William Neitzel—3 Fowler's toads, Michigan; from Chicago Zoological Society—a chimpanzee.

NEW MEMBERS

The following persons were elected to membership in Field Museum during the period from August 13 to September 15:

Associate Members

Lincoln R. Clark, Fred Y. Coffin, Mrs. Walter G. Moeling, John K. Prentice.

Annual Members

John F. Carlson, Alonzo J. Coburn, Barney Cushman, Leland E. Eaton, Mrs. William H. Emery, Miss Grace Gallagher, Edward E. Henderson, Mrs. Ernest H. Hicks, H. K. Humphrey, Mrs. Austin Jenner, Mrs. Robert O. Law, Hugh M. Melville, Henry G. Miller, William Reiss, Fred B. Snite, Edmund H. Taylor, Emory H. Wilder, Arlen J. Wilson, William Wilson.

Associate Curator Honored

Associate Curator Paul C. Standley has been elected an honorary member of the Sociedad Venezolana de Ciencias Naturales, of Caracas, Venezuela.

Wisconsin children collect small, round concretions in sandstone and use them for marbles. Examples are shown in Clarence Buckingham Hall (Hall 35).

Field Museum News

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BENGAL TIGERS, SHOT BY ROOSEVELTS, EXHIBITED IN NEW HABITAT GROUP

Two Bengal tigers, collected by the James Simpson-Roosevelts Asiatic Expedition during a hunt in which Colonel and Mrs. Theodore Roosevelt and Mr. and Mrs. Kermit Roosevelt were the principal participants, were placed on exhibition last month.

The animals are the central figures in a new habitat group which is one of the most spectacular exhibits in William V. Kelley Hall of Asiatic mammals (Hall 17). They appear amid a representation of a scene in central India. In the foreground is seen a large male tiger whose expression and attitude indicate that he has been startled just after a successful attack upon a wild boar lying near-by, the flesh of which he was apparently about to devour. A female tiger, presumably the killer's mate, which evidently had expected to share the prey, is seen likewise frightened and slinking off behind tall grass. The animals were mounted by Staff Taxidermist C. J. Albrecht, and the background is the work of Staff Artist Charles A. Corwin.

To obtain the tigers shown in this group, the Roosevelts had to organize a large hunting party with elephants, and with native beaters and hunters as aids—the usual

practice when on the trail of the great striped cats. With such a party the spot where the tigers are known to be is surrounded, and the animals are driven from cover by the native beaters into the range of the rifles of

Curator of Zoology. Still-hunting requires much skill and patience, since the tiger is much more elusive than the lion.

"In size, strength and power the tiger equals or even exceeds the lion, and could dispute the African animal's title as 'king of beasts,'" says Dr. Osgood. "Its stripes are distinctive, it being the only one of the larger cats having such markings. A large male tiger may reach a length of slightly more than ten feet and a weight of over 500 pounds.

"The several varieties of tigers probably are only geographic races of a single species. The Bengal tiger is the variety of India, of good size, rich color and short smooth coat. The northern or Manchurian tiger is large, pale and soft-coated. Another occurs in Persia, and smaller ones in Sumatra, Java and Bali.

"Tigers prey chiefly upon deer and pigs, but may kill animals as large as the buffalo. They also attack

domestic animals and not infrequently form the man-eating habit. This occurs among them more often than among lions, a fact which may be attributable to the circumstance that they inhabit regions more thickly populated."



Bengal Tigers

In this new habitat group in William V. Kelley Hall, these great cats of India appear to have been startled just after the killing of a wild boar. Specimens collected by James Simpson-Roosevelts Expedition.

the hunters on the elephants' backs. Sometimes tiger hunters use bait such as live donkeys or goats to lure the animals. Although not very sportsmanlike, this is in some places a generally accepted practice, it is stated by Dr. Wilfred H. Osgood,

the hour of the lecture, after which time all unoccupied seats will be offered to the public. The west entrance of the Museum will be open from 2 P.M. on.

A NEW ORCHID DISCOVERED IN THE CHICAGO REGION

Twenty-six species of orchids are known to grow wild in the Indiana Dunes, and about thirty in the whole Chicago region. The group has attracted the attention of many persons, and locally it is perhaps better known than almost any other plant family. Consequently it is surprising to learn that an addition to the local orchids was discovered recently.

E. C. Page of Evanston, who is interested in the cultivation of native orchids, discovered in early June near Pine, Indiana, several plants of *Spiranthes lucida*, one of the orchids known by the name "ladies-tresses." The two other species of *Spiranthes* known from the Lake Michigan region bloom late in autumn. Mr. Page's discovery, authenticated by a specimen which he deposited in Field Museum's Herbarium, represents the first record of this orchid for Indiana.

ACTING CURATOR APPOINTED

Dr. Paul S. Martin has been appointed Acting Curator of the Department of Anthropology, to fill the vacancy caused by the death of Dr. Berthold Laufer, Curator.

Dr. Martin has been Assistant Curator of North American Archaeology at Field Museum since 1929. During that time he has revised the Museum's collections representing the archaeology of North American Indian tribes, and, as leader of the Field Museum Archaeological Expedition to the Southwest, has conducted four seasons of excavations and research on the Lowry ruin, a prehistoric Indian site in Colorado. Prior to his connection with Field Museum, Dr. Martin was a member of the staff of the Public Museum in Milwaukee, and of the Colorado State Museum in Denver.

Change in Visiting Hours

Effective November 1, and continuing until March 31, winter visiting hours—9 A.M. to 4:30 P.M.—will be observed on weekdays at Field Museum; 9 A.M. to 5 P.M. on Sundays.

SPECIAL LECTURE FOR MEMBERS

In addition to the Saturday lectures now being presented, a special lecture for Members of Field Museum will be given in the James Simpson Theatre of the Museum on Sunday afternoon, November 25, by Air Commodore P. F. M. Fellowes, D.S.O., A.D.C., of London. Commodore Fellowes' lecture will be on "The Conquest of Everest," and will be illustrated with motion pictures of the Houston-Mount Everest Expedition on which he and other explorers flew above the summit of the world's highest and most dangerous peak. For the general public Commodore Fellowes is to give the same lecture on Saturday afternoon, November 24, and the Sunday appearance has been arranged to insure that all Members who so desire may have opportunity to hear this very remarkable presentation.

Members need only show their membership card to an attendant at the Theatre on the afternoon of the lecture. On presentation of the card a Member will be given tickets entitling him to two seats in a reserved section of the Theatre. Seats in this section will be available until 3 P.M.,

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:

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, 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.

STRAUS EXPEDITION RETURNS FROM WEST AFRICA

BY RUDYERD BOULTON
Assistant Curator of Birds

In January of this year Field Museum sent into the hinterland of West Africa an expedition to collect birds and mammals. One of the prime objectives was the assembling of material for bird habitat groups planned for the proposed new hall of exotic birds. The expedition was made possible by the generosity of Mrs. Oscar Straus, of New York, who accompanied the party on a large part of its journey. The personnel of the expedition included the writer, who acted as leader and was in charge of bird collecting; Frank C. Wonder of the Museum's taxidermy division, who collected mammals; and John F. Jennings of Chicago, who was in charge of photography. Mrs. Laura C. Boulton, working under a grant from the Carnegie Corporation, accompanied the expedition to study the music of native tribes.

The expedition left Dakar, Senegal, westernmost point of the African continent, early in February. Three Ford cars carried personnel, half a dozen native assistants, and equipment and supplies for three months. At Fatick, about a hundred miles inland on a brackish arm of the sea, the first camp was established. Here collecting was begun. In a small group of palm trees was found the daytime refuge of myriads of fruit bats with a wing spread of almost two feet. In late afternoon, when they fared forth for the evening, the air was filled with queer shapes like Chinese kites.

After a short stay in this vicinity the expedition moved on about seven hundred miles to Bamako, capital of the French Sudan. The road, extremely difficult in places, passed through various vegetational zones as the semi-humid influence of the Senegal and Niger Rivers resisted the encroaching aridity of the Sahara to the north.

While Messrs. Boulton and Wonder reconditioned cars and collected specimens, the Governor of the French Sudan made available facilities for the other members of the expedition to obtain valuable material.

Mr. Wonder remained in the Sudan and Senegal to collect mammals and birds while the rest of the expedition moved on to Mopti where collections and motion pictures of birds on the Niger River were made. Although not so well known, the abundance of water birds here exceeds even the famous aggregations of birds on the upper Nile.

At Sangha, home of the cliff dwelling Habbe, there was encountered as primitive, or rather, as "uninfluenced" a society of people as exists anywhere in Africa. It was interesting to note, therefore, that among them, before harvest time a cowrie shell (their medium of currency) is worth more than it is later—thus, even in the life of so-called primitive peoples the principles of monetary fluctuation are in operation.

The expedition then moved on to Gao where it was decided to cross the Sahara to the Mediterranean, thus enabling Mrs. Straus, whose time available to the expedition had expired, to return to New York. Loading fifteen hundred pounds of gas, oil, water, food and baggage, in addition to four persons, onto a Ford sedan, we set out across an 800-mile stretch of desert where there was neither human habitation nor drop of water. The journey to Oran and the return to Gao, three thousand odd miles, was safely concluded, although not without considerable effort. After a trip to Timbuctoo the expedition journeyed south through Dahomey and Nigeria to Mt.

Cameroon. After collecting in the rain forests at the 6,000-foot altitude we climbed to Cameroon's 13,300-foot peak, making ecological and zonal studies on the way. Field work was concluded in the lowland forests of southern Nigeria.

Results accruing to Field Museum from the expedition include materials for two bird habitat groups—one of a weaver's nesting colony, and one of plantain-eaters in the mountain forest of Cameroon; and collections of about 650 birds, 600 mammals, 1,000 fishes and reptiles, 2,000 insects, 1,000 still photographs, and 15,000 feet of motion pictures.

EXTINCT "SEA SERPENTS"

BY BRYAN PATTERSON
Assistant in Paleontology

In dealing with cases of murder, courts of law usually require that the body of the supposed deceased, or at least parts of it, be produced in order to substantiate the charge. Analogously, the reports of sea serpents which have become common in the press during the past year or so cannot be seriously considered in the absence of definite physical evidence of the "monsters." To date, so far as the writer is aware, but one corpse of a "sea serpent" has come to light, and this was pronounced by competent authorities to be nothing more than a mutilated basking shark. The existence of sea serpents in the modern world remains unproven and most improbable.

In the ancient world, however, millions of years ago, two groups of marine reptiles existed which would serve admirably as sea serpents were they living to-day. These were the plesiosaurs and the mosasaurs. The plesiosaurs inhabited the seas in the Jurassic and Cretaceous periods of the earth's history. They were broad and flat in the body and propelled themselves mainly by their long, powerful paddles. Some of them had extremely long necks and small, rather snake-like heads. Such a neck and head protruding from the water would have appeared indeed serpentine.

The mosasaurs flourished in the upper Cretaceous, being particularly abundant in the shallow sea then covering what is now the state of Kansas. Closely related to the modern lizards, they attained great size, the largest kinds reaching lengths of nearly thirty feet. They had long pointed heads, short necks, long fairly slender bodies, and very long tails. Swimming was accomplished chiefly by movements of the tail, the paddles being used for steering. These creatures, far more than the plesiosaurs, were the ideal "sea serpents" of the past. Unfortunately for the seeker after sensation, however, they have been extinct for more than 60,000,000 years.

Fossil specimens of both mosasaurs and plesiosaurs may be seen in Ernest R. Graham Hall (Hall 38). Paintings by Charles R. Knight which show a representative of each group as it probably appeared in life, may be seen on the walls of the same hall.

Museum Honors Danish Scientist

Dr. Carl Christensen, retired curator of the Botanical Museum of Copenhagen, has been made a Corresponding Member of Field Museum in recognition of his valuable services to this institution in enabling J. Francis Macbride, conducting the Joint Botanical Project of the Rockefeller Foundation and Field Museum, to make photographs of important type specimens of plants. Dr. Christensen is one of the two foremost authorities on ferns in the world.

EIGHT NEW SCULPTURES OF RACIAL TYPES ADDED TO CHAUNCEY KEEP MEMORIAL HALL

Sculptures of eight more racial types were added last month to the exhibits in Chauncey Keep Memorial Hall (Hall of the Races of Mankind), bringing the series practically to completion. Altogether the hall now contains ninety studies (including several groups, which bring the number of individuals portrayed up to one hundred) of representative types of the races of the world. Nothing further remains for addition to the series except a head of a Beduin which the sculptor, Malvina Hoffman, will finish in the near future.

One full length figure, that of a Navaho



Navaho

which stands unique among museum achievements the world over, was made possible by an initial legacy bequeathed by the late Chauncey Keep, and by generous contributions from Marshall Field, Mrs. Stanley Field, and Mrs. Charles H. Schweppe. The Unity of Mankind group occupying the center of the hall, and consisting of heroic figures representing the three major racial divisions of mankind—white, yellow and black—is a gift from Mrs. Schweppe.

The hall is divided into three sections, one containing the full length figures, family groups, busts and heads of the peoples of Africa and Oceania, another containing those of the Asiatic races,

while the central one has the racial representatives of Europe, the Americas, and additional parts of Asia. The comprehensive nature of the survey of mankind offered in this hall is indicated in the following list, by geographical divisions, of the sculptures:

AFRICA: Bushman family group, of the Kalahari Desert, South Africa; aged Bushman; Bushman woman; Negro dancing girl, Sara tribe, Lake Chad district; Abyssinian woman; Hamite of Abyssinia, east Africa; Negro drummer of Senegal; Batwa boy with filed teeth, Belgian Congo; Sudanese woman; Negro of Dahomey, West Africa; Shilluk warrior, Upper White Nile, East Africa; Berber of



Berber

Morocco; Mangbetu woman of Belgian Congo; Somali of northeast Africa; Zulu woman of South Africa; Nubian of the Nile Valley, Egypt; group of pygmies of the Ituri Forest, Belgian Congo; Ubangi duck-billed woman, French Equatorial Africa (exhibited as an example of bodily deformation).

EUROPE: Mediterranean type of northern Italy; Mediterranean type of France; Mediterranean type represented by Sicilian fisherman; Lapp of northern Scandinavia; Anglo-Saxon, Great Britain; Breton woman, Brittany, France; Alpine type of central Europe; Nordic type of Europe and United States; Basque, of northern Spain; Georgian, of the Caucasus.

ASIA: Vedda of Ceylon; Singhalese of Ceylon; Rajput woman of India, belonging to the low caste of "untouchables"; Arab of Kish, Iraq; Turk; Kashmiri in attitude of meditation, India; Kashmiri; Bengali, India; Bengali woman; woman of Jaipur, India; Brahman, Benares, India; Afghan, Peshawar, India; Burmese, Burma; Toda, Dravidian group, southern India; Tamil tree



Toda

climber, Dravidian group, southern India; Andaman Islander; Cantonese woman, southern China; woman of Lhasa, Tibet; merchant of Lhasa, Tibet; Korean; Chinese scholar, central China; Chinese woman scholar, southern China; Chinese scholar, southern China; Chinese student; jinriksha man, northern China; Manchu, of Peiping, China; Mongol, of Outer Mongolia; Chinese man of Shanghai; Japanese of Tokyo; Japanese woman; young Ainu, island of Yezo, northern Japan; old Ainu, island of Yezo, northern Japan; Padaung giraffe-necked woman, Karen group, Upper Burma (exhibited as an example of bodily deformation).



Carib

AMERICA: Eskimo woman; Eskimo man; Navaho Indian, New Mexico; San Ildefonso, New Mexico; Jicarilla Apache Indian, New Mexico; Tehuelche, Patagonia; Sioux Indian; Blackfoot Indian; Carib, Amazon Basin; Maya of Yucatan.

OCEANIA AND AUSTRALIA: Hawaiian riding surf board; Hawaiian; Samoan; Igorot, Philippine Islands; Solomon Islander climbing tree; Malay, Malay Peninsula; Dyak of Borneo; Sakai of Tapah, Malay Peninsula; Semang pygmy of Malay Peninsula; Jakun of Malay Peninsula; Jakun girl, of Malay Peninsula; Javanese boy; Javanese girl; woman of Bali; Australian aboriginal man; Australian aboriginal woman and boy; group watching cockfight—types of Madura, Borneo, Java and Bali.



Igorot

A revised edition of the leaflet, *The Races of Mankind*, dealing with the exhibits in this hall, and with the subject of racial problems in general, has just been published by the Museum. It contains 44 pages of text and nine photogravure plates, and is available at 25 cents per copy. On mail orders, 3 cents additional should be sent for postage.

Few Copies of "Jade" Left

Only a very limited number of copies of *JADE, A study in Chinese Archaeology and Religion*, by Berthold Laufer, published by Field Museum in 1912, remain on hand. This cloth-bound book, containing 370 pages of text, 68 plates (of which six are colored), and 204 text-figures, has, because of its unique character and the extremely attractive manner of presenting its subject, long since become a collector's item. Although sold at \$50 a copy for several years, the price was reduced to \$25 in 1932. Now,

because of the death of the author, the dwindled supply available, and the unlikelihood of a second edition being issued within the next few years, it has become necessary to restore the price to \$50, effective November 1.

Work by Standley Published

There has recently been published by the New York Botanical Garden a 70-page part of the *North American Flora*, devoted to the family Rubiaceae and prepared at Field Museum by Associate Curator Paul C.

Standley. The two earlier parts treating this family appeared in 1918 and 1921. Two or three further parts will be needed to complete the treatment of the North American plants of this group, which is one of the largest families of tropical plants.

Invertebrate Fossils Collected

Assistant Curator Sharat K. Roy, invertebrate paleontologist, recently returned to the Museum from a field trip upon which he collected Pennsylvanian fossils in Nebraska, and Cambrian fossils in Pennsylvania.

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FOUR MORE LECTURES IN AUTUMN COURSE

During November the final four lectures in the Museum's Sixty-second Free Course will be given on Saturday afternoons. 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 listed the dates, subjects, and speakers:

November 3—The Human Adventure

Talking picture sketching man's rise from savagery to civilization

Produced by the Oriental Institute of the University of Chicago with the technical assistance of Erpi Picture Consultants, Inc.

November 10—Islands of the Pacific

H. C. Ostrander, Jersey City, New Jersey

November 17—Life on the Ocean Bottom and Wonders of the Plant World

Arthur C. Pillshury, Berkeley, California

November 24—The Conquest of Everest

Air Commodore P. F. M. Fellowes, D.S.O., A.D.C., London, England

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 PROGRAMS FOR CHILDREN CONTINUE

Five more of the free motion picture programs for children, presented by the James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures, remain to be given on Saturday mornings from November 3 to December 1 inclusive. These entertainments are given in the James Simpson Theatre of the Museum. Each program is presented twice, at 10 A.M., and 11 A.M. Children from all parts of Chicago and suburbs are invited. Following is the schedule of dates and the films to be shown on each:

November 3—By Dog-train and Snowshoes; In Canada's Fiords; The Bella Coola Indians; The Romance of Rubber

November 10—From Trails to Rails; The Octopus and Its Cousins; In a Caveman's Home

November 17—Our Animal Neighbors; The Cement Gnomes; Women Workers of Ceylon

November 24—An Arctic Visitor; The Story of the Pilgrims

December 1—The Fall Winds Blow; The Woodchuck Sleeps; A Friend to All the World; Winter Fun

MEETING OF ORNITHOLOGISTS HELD AT THE MUSEUM

Field Museum was host last month to the American Ornithologists' Union, which held its fifty-second stated meeting in the James Simpson Theatre and the Museum lecture hall on October 23, 24 and 25. Nearly 200 leading ornithologists from all parts of the country attended. This was the second time the Union had held such a meeting at Field Museum, the last one here having been twelve years ago.

Both technical and general sessions were held. Important contributions and discussions on scientific aspects of ornithology were presented at the technical sessions. At the general sessions, which were open to the public, lectures on various phases of ornithology were heard, and motion pictures were shown, including films made on the Straus West African Expedition of Field Museum.

In Hall 20 of the Museum a special display was arranged for the visitors of about one hundred original paintings of Abyssinian birds and mammals made by the late Louis Agassiz Fuertes, noted naturalist and artist, during the course of his work as a member of the *Chicago Daily News*-Field Museum Abyssinian Expedition. Also placed on exhibition were a series of enlarged photographs of previous meetings of the American Ornithologists' Union, loaned by the Library of Congress from the collection, on deposit there, made by the late Ruthven Deane, a Chicagoan.

Members and their guests were entertained at the Zoological Gardens of the Chicago Zoological Society at Brookfield, at the Century of Progress Exposition, and elsewhere. A tea was given for them in the trustees' lounge of the exposition by Miss Margaret Conover with Mrs. Rudyerd Boulton assisting. Among local organizations which cooperated in making the meeting a success were the Illinois Audubon Society, Chicago Academy of Sciences, Chicago Ornithological Society, and the Inland Bird Banding Association.

MEXICAN STONE SCULPTURE

By J. ERIC THOMPSON

Assistant Curator of Central and South American Archaeology

The finest examples of Mexican sculpture are found in the Totonacan region of Veracruz and adjacent territories. The best stone work from this area is more like Maya than Aztec work. This, perhaps, is to be expected, since the Totonacan area is close to the northern fringes of the Maya country.

Some of the most excellent examples of stone work in this region are the so-called *palmas*. These are slender stones, from one to three feet in height, carved on the front with human, animal, or curvilinear designs. The back also is usually carved, except for a short section near the base. The sculptures are rarely seen outside of Mexico, and Field Museum is fortunate in possessing a representative series, recently placed on exhibition in Hall 8.

One of the best of the Museum's examples was found at Tetela del Oro, Puebla, and is made of a scoriaceous basalt. Carved on it is a human face which reveals much character. A projection above this represents the conventionalized upper jaw of a feathered serpent—a common Mexican art motive. A circular ear-plug is inserted in the lobe of the man's ear.

We have no information as to what purpose these stones served. The cusp-shaped base, which nearly all possess, would suggest that they were placed on horizontal poles. As the backs are usually carved, the stones must have stood free of any background except a short support, against which the uncarved strip at the base rested. Possibly they adorned the fronts of ceremonial litters, in which idols representing gods were carried in procession, or perhaps they stood on the wooden racks in front of temples in which the skulls of sacrificial victims were kept.

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:

Thursday, November 1—General Tour; Friday—Habitat Groups.

Week beginning November 5: Monday—Men of the Stone Age; Tuesday—Plants Native to the Americas; Wednesday—Asiatic Animal Life; Thursday—General Tour; Friday—Life in the Far North.

Week beginning November 12: Monday—Turpentine, Lacquer and Amber; Tuesday—Prehistoric Life; Wednesday—Mammal Families; Thursday—General Tour; Friday—Indians of Plains and Deserts.

Week beginning November 19: Monday—Gems and Jewelry; Tuesday—Animals of the Chicago Region; Wednesday—Primitive Musical Instruments; Thursday—General Tour; Friday—Fruits and Nuts and Their Uses.

Week beginning November 26: Monday—Roman and Etruscan Exhibits; Tuesday—Snakes and Lizards; Wednesday—Ancient Burials; Thursday—Thanksgiving holiday, no tour; Friday—Story of Coal and Iron.

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 Benjamin B. Felix—48 Chinese and 2 Japanese coins; from Homer E. Sargent—a blanket, Algeria; from Edward Hines Lumber Company—a board of Ponderosa pine, Oregon; from James Zetek—156 herbarium specimens, Barro Colorado Island; from School of Forestry, Yale University—23 herbarium specimens, Ecuador; from Rev. Brother Elias—50 herbarium specimens, Colombia; from Dr. Martin Cardenas—93 herbarium specimens, Bolivia; from Mrs. T. R. Jones, Jr.—2 specimens of dendrite on novaculite, Arkansas; from Robert Sloane and A. R. Renner—a wood opal specimen, Oregon; from Paul H. Mitchell—a specimen of stigmara, Illinois; from Eldorado Gold Mines, Ltd.—3 specimens of radium and silver ore, Canada; from Edward C. Sylvanus—a polished slab of Mexican onyx, Wisconsin; from Douglas Sullivan—a black widow spider, Missouri; from G. S. Pearsall—3 mole crickets, Illinois; from William C. Wood—20 tiger beetles, United States; from Maurice L. Bristol—3 cicadas, Illinois; from Chicago Zoological Society—an echidna in the flesh, Australia, and a chimpanzee in the flesh, West Africa; from Professor Theodore H. Hubbell—6 camel crickets, Michigan and Ohio; from L. C. Cole—2 lizards, Arizona; from F. J. W. Schmidt—a painted turtle, Wisconsin; from Mrs. E. Walton—2 black-throated green warblers, Illinois; from Boh Cutler—a green snake, Illinois; from Thomas A. Carney—4 wood opal specimens, Washington.

NEW MEMBERS

The following persons were elected to membership in Field Museum during the period from September 17 to October 15:

Corresponding Members

Dr. Carl Christensen

Associate Members

George J. Avery, Miss Lillian D. Bargquist, Mrs. Alfred S. Burdick, Mrs. D. Mark Cummings, Mrs. Everett J. Granger, Mrs. Bertram M. Winston.

Sustaining Members

Mrs. Maurice Berkson

Annual Members

Miss Jane Adams, Mrs. S. W. Bertram, P. W. Bielfeldt, Mrs. George Bolla, Mrs. Robert C. Borwell, Mrs. J. E. Boyer, George H. Daugherty, Jr., Mrs. Lewis J. Day, H. O. Edmonds, Arnold H. Exo, W. L. Fenner, Mrs. W. A. Fisher, Allen Grawoig, P. S. Howard, Mrs. Louis T. Jacques, Porter F. Leach, Thomas J. Morris, Miss Hedwig H. Mueller, Mrs. Gertrude L. Osborn, Willard B. Pillsbury, A. J. Raackin, Louis T. Sayre, Mrs. E. A. Smith, Carroll H. Sudler, Jr., W. E. Van Deventer, Mrs. George A. Whipple, Mrs. Farwell Winaton.

Peat is used for many purposes other than burning, as is demonstrated in an exhibit in Hall 36.

Field Museum News

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NEW GROUP SHOWS THE SLOTH BEAR, ONE OF ASIA'S STRANGEST ANIMALS

BY WILFRED H. OSGOOD
Curator, Department of Zoology

One of the most unusual members of the bear family is the sloth bear of India and Ceylon. Although of good size and sufficiently like northern bears to pass as one in a nursery classification of big, little, and middling sized, it differs widely from the better known species with which most people are familiar. In general appearance

it borders on the grotesque, for it is bow-legged, flat chested, shaggy-haired, and long-snouted, besides having numerous less obvious peculiarities not found in other bears. Therefore it provides an interesting subject for a group recently completed and exhibited among other Asiatic mammals in William V. Kelley Hall (Hall 17).

While northern bears range over a wide territory and may be divided into numerous closely related varieties, the sloth bear is very restricted, being found nowhere else except in India and Ceylon. In this region, however, it is fairly common and well-known. Every writer on natural history and sport in India has much to say about it, usually dwelling especially upon its interesting feeding habits. These are as specialized as those of the polar bear, but in a different direction.

Nearly all bears relish a few insects in their diet and most of them are willing at times to do some grubbing and digging, but the sloth bear makes all the rest of them look like amateurs. Its food is varied with fruit, birds' eggs, honey and other miscellany, but its main dependence is upon insects, especially ants and termites. For securing such food it is equipped with a long mobile snout, an extensible tongue, and powerful digging claws. It tears open the termites' nests, blows out the dust, and literally sucks the inhabitants from the winding galleries in which they are concealed. An excellent account of this by A. A. Dunbar Brander may well be quoted, as follows:

"In searching for insects he displays great ingenuity. In attacking a white ants'

nest he burrows into the base until he reaches the core; the finer dust is then expelled by blowing, and possessing great powers of suction, the termites, as well as a considerable amount of earth, are then drawn along the galleries into his mouth. In carrying out this performance the sound produced by the violence of his inhalations can be heard at a considerable distance. It has even been stated that he can suck out

add, however, that sheer hunger may not have been the only motive, and he cannot escape the accusation of being something of a gourmet."

The sloth bear is a good climber and he commonly ascends trees for fruit and especially for honey. His strategy in the latter case is to knock the bees' nest to the ground where he returns to feast on the comb while the infuriated owners remain

buzzing about the treetop. Where natives put out small pots to catch palm sap the bears often find it to their liking and work much havoc, apparently sometimes becoming partly intoxicated from the fermented sap. Sugar cane also attracts them to the disadvantage of the planter.

Owing to its southern distribution, the sloth bear does not hibernate, but it is partial to caverns in the rocks, where it finds a cool retreat during the heat of the day. It is active mainly at night and is shot by hunters usually by chance encounter, although it can be pursued with dogs and by various other methods. Its teeth, especially the molars, are much reduced in size, in conformity with its diet, but its powerful claws and its canine



Sloth Bears

New habitat group in William V. Kelley Hall. These animals represent one of the most peculiar of all species of bears. They are found only in a limited area comprising part of India and Ceylon.

a grub from a piece of timber. It is common to come on huge holes dug by bears often on a jungle road. I once witnessed a bear digging a hole of this nature. The bear stopped, and after sniffing the ground intently for perhaps half a minute, he suddenly set to as if his very life depended upon it, and the earth simply flew out, in a manner that suggested the use of some mechanical contrivance. In an incredibly short time his head and fore-quarters were out of sight. He presently raised his head, and having evidently accomplished his task, I shot him. He still held in his mouth the broken shell of a dung beetle's cocoon which contained a large white grub. Considering the labour entailed merely to procure this toothful some idea can be formed of the amount of energy expended by a bear in keeping himself alive. It is necessary to

teeth make it a dangerous antagonist. Large males may reach a weight of over three hundred pounds. In rare instances they have been known to attack man without apparent provocation.

The Museum's group shows a pair busily engaged turning stones and grubbing among roots along a dry stream bed. A small cub rides, as is quite habitual, on its mother's back where the long, shaggy hair makes it easy to cling. The adult bears in the group were collected by the late Colonel J. C. Faunthorpe of Bombay, and the cub by Dilipat Singh of the same city. The group was prepared by Taxidermist Arthur G. Rueckert, assisted by Wilmer E. Eigsti. The painted background is by Staff Artist Charles A. Corwin, from field studies made in India through the co-operation of the Bombay Natural History Society.

Last Children's Program December 1

The final program in the autumn series for children presented by the James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures will be given in the James Simpson Theatre of

the Museum on Saturday morning, December 1. The motion pictures to be shown are "The Fall Winds Blow," "The Woodchuck Sleeps," "A Friend to All the World," and "Winter Fun." There will be two showings, one at 10 A.M., and one at 11.

Gold and Silver Alloys

An exhibit of alloys used with gold and silver, explaining the properties resulting from the varying proportions used, is included in the Department of Geology (Frederick J. V. Skiff Hall, Hall 37).

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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WILFRED H. OSGOOD.....	Curator of Zoology
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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, 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.

FIELD MUSEUM NEEDS SPECIMEN OF EXTINCT GREAT AUK

At an auction held in London on November 14 there were placed on sale two specimens (male and female) of the extremely rare great auk, and six eggs of this extinct bird. Opportunities to obtain such material are most infrequent, as of the 79 or 80 skins of the great auk known to be in existence all but about twenty are in the collections of permanent public institutions and therefore probably never again will reach the market. The total number of eggs of this bird known to be in existence is 75.

The great auk is the only extinct American bird of which Field Museum lacks a specimen. Unfortunately, the Museum, because of the strict limitations of its budget at the present time, was in no position to avail itself of the opportunity to bid on one of the auctioned specimens. In 1929 a great auk specimen was sold for \$3,300; on the present market it is believed that one might be obtained for perhaps one-half of that amount.

Among American cities with museums which possess great auk specimens are



Great Auk

A replica of the extinct bird, made from feathers of other birds. An original specimen would be a highly desirable addition to Field Museum's collections.

New York, Washington and Philadelphia. No museum west of Philadelphia has one. Even if funds should be made available to Field Museum for the purchase of a great auk specimen, it is not certain whether one could now be located that is for sale, although it is believed that it would be possible to obtain one within a reasonable time. If any person interested in filling this gap in Chicago's principal natural history collections should place funds at the disposal of the Museum for this purpose, the Museum would accept the funds with the understanding that it would undertake to negotiate such a purchase, and in the event of failure to locate a satisfactory specimen obtainable at a price within the funds furnished, the money would be returned to the donor. Likewise, should a purchase be made at a cost less than the amount of the funds furnished, any surplus funds above the price of the specimen and the expenses incidental to consummating the transaction would be returned to the donor.

"The acquisition of an original specimen

of a bird or other animal so rare as a great auk is of as much importance to a scientific museum as the acquisition of a genuine old master is to an art museum," says Dr. Wilfred H. Osgood, Curator of Zoology.

The great auk, also known as the gare fowl, once ranged the North Atlantic coasts of both America and Europe. On this continent it was normally found from Newfoundland south to Massachusetts, but occasionally in winter was seen as far south as Florida. It was exterminated through the ruthlessness of codfishermen who chopped the birds up to use them as bait. In America it has been extinct since 1840; in Iceland since 1844. In historic times the great auk had only five known nesting places—Funk Island, Newfoundland, which was its principal headquarters; and Iceland, the Faroe Islands, St. Kilda and the Orkneys. The great auks, which were flightless creatures with small penguin-like wings, averaged about 30 pounds in weight, and stood about two and one-half feet tall in normal sitting position.

A PLAN THAT WILL SIMPLIFY CHRISTMAS GIFT PROBLEMS

In accordance with its annual custom, Field Museum is again offering its Members assistance in the solution of some of their Christmas gift problems, by making available a plan whereby with maximum convenience they can present Museum memberships to friends.

A folder describing the Christmas gift membership plan, a handy application form, and a postage-prepaid addressed envelope for mailing the application to the Museum, will be found enclosed with this issue of FIELD MUSEUM NEWS.

The task of selecting gifts is reduced to the simplest possible proportions by this means. Time and effort which would be devoted to shopping are saved, and the burden of preparing and sending packages is eliminated.

In fact, to use Museum memberships as gifts, you have nothing whatever to do but write the name and address of the friend to whom the membership is to be presented, and your own name and address, and mail the application to the Museum with remittance for the membership fee. The Museum will take care of all other details for you. It will send an attractive Christmas card to the proposed recipient, upon which will be indicated the fact that the membership is a gift from you. It will also inform the recipient as to what the privileges of membership are.

Should you wish to make a number of Christmas presents of this type, additional application forms may be obtained by telephoning (Wabash 9410) or writing to the Museum, or names may be merely sent in a letter.

It is advisable to send in applications before December 17 to assure delivery of the greeting and notification cards to the recipients of your gifts by Christmas Day. The \$10 annual membership is the most popular for this purpose, but other classes of memberships are also available.

A Museum membership is a distinctive gift indicating to the recipient that you estimate him as a person of intellectual qualities. It is a gift that will bring reminders of your thoughtfulness many times a year, through the monthly issues of FIELD MUSEUM NEWS, through reserved seats for the two courses of Museum lectures, and through other privileges in which the recipient of your gift will participate.

EXPEDITION EXCAVATES ONE OF LARGEST AND OLDEST KIVAS OF PREHISTORIC INDIANS

What is probably the oldest, and certainly one of the largest, of Great Kivas or underground ceremonial chambers, built by prehistoric Indians 1,000 years ago or more, has been excavated by the Field Museum Archaeological Expedition to the Southwest. Only five other such great kivas are known. The one now laid bare is of a much more primitive type than any of the others, and apparently was constructed at a very much earlier date.

Dr. Paul S. Martin, Acting Curator of the Department of Anthropology, and leader of the expedition, returned to the Museum recently at the conclusion of the 1934 season of excavations on the Lowry ruin, which is located on a mesa near Ackmen, Montezuma County, in southwestern Colorado. Due to the assistance given by a force of workmen furnished by the Montezuma County Emergency Relief Administration, under FERA authority, greater progress was made than in any of the three previous seasons of the expedition's work.

The newly discovered kiva, which has an inside diameter of 47 feet, has a feature never before encountered. Around the outside of it, and connected with it, were peripheral rooms the walls of which were constructed of poles and brush instead of masonry such as has characterized other structures associated with the early Pueblo Indians. Beneath the kiva is a smaller one of earlier date.

A mystery about the ruins of this ancient community of subterranean homes and chambers, which had puzzled Dr. Martin in past seasons, was the lack of evidences of burials of the inhabitants. This was cleared up during the past summer, with the discovery of human skeletal remains buried under some of the ancient walls. Fourteen such burials were uncovered. It appears that the ancient people of this place had a curious practice of partly dismembering the dead, burying one part, as for example the head, in one place, and the rest of the body elsewhere. No complete skeletons were found, but there were uncovered separate sets of bones which seemed to match up with other sets so as to form complete skeletons. Such dismemberment may or may not be significant of some tribal rites. Associated with the skeletal remains in the graves were found 44 pieces of pottery.

The collection brought back to the Museum includes the human remains and

pottery, as well as some 4,000 potsherds, and great quantities of arrowheads, beads, axes, bone implements, and other artifacts.

"Lowry Ruin today, to the casual eye, would seem to be a homogeneous development of one type, but the researches of this expedition have uncovered evidences of a history going back more than 2,000 years, and involving an origin in the most simple semi-subterranean houses," states Dr. Martin. "Twenty-five feet below the surface and under the foundations of the buildings now exposed we have found

ruins, and added pottery making to their industry of basket weaving. Later these people responded to their nomadic inclinations and again the site was abandoned.

"After a hundred years it was repopulated by a group from a highly civilized tribe designated as Chacoan because they inhabited what today is called Chaco Canyon in New Mexico. Following their cultural heritage, the newcomers built a highly complex home terraced to a height of three stories and divided into many separate family rooms. Their masonry and their

pottery were excellent. Although the pueblo was later to grow to larger dimensions, the cultural peak was reached in this period from A.D. 900 to 1150. These people originated the special chambers or kivas for ceremonial usage. Like the kivas in the inhabited Indian pueblos of the present day, it is assumed that these chambers were used for meetings of secret societies of the men, dormitories for unmarried men, and as the center of men's amusements as well as for tribal policy discussions of serious import. The present day Indians allow no woman to enter these meeting places, and probably this ban existed also in the ancient kivas.

"The Chacoan people lived on this site for about 250 years, and then they too abandoned the town site. About A.D. 1200 the final occupation of the site occurred when a group of Mesa Verde Indians moved upon it.

They were culturally on a lower level than their predecessors, for while they enlarged the pueblo to nearly double its former size, their pottery and their masonry were of very inferior quality. The old rooms they re-used for storage, and the bins they placed in them are still there. Either warring nomads or inclination determined these last occupants to move, and since then the site has been left to the mercy of the elements.

"The dates cited are fairly accurate, and are obtained by comparing roof beams found in the ruin with an annual tree ring calendar, developed by Dr. A. E. Douglass of the University of Arizona" (see FIELD MUSEUM NEWS, July, 1934). "This calendar registers the weather peculiarities extending from the present time back to the beginning of the Christian era."

The expedition this year, as in its past three seasons, was made possible by funds provided by the late Julius Rosenwald and Mrs. Augusta N. Rosenwald.



Great Kiva of Prehistoric Americans

Photograph taken from a 50-foot tower, showing huge underground ceremonial chamber built by Indians about 1,000 years ago, as laid bare by excavations of the Field Museum Archaeological Expedition to the Southwest. This is probably the oldest, as well as one of the largest, of Great Kivas.

remnants of the homes of the first Indians that lived there, about the year A.D. 100. At that time the ground was covered with unspectacular mounds of earth, each characterized by a smoke hole and a tunnel entrance, invariably facing southeast. These were houses encircled with stockade walls and brush roofs covering oval pits averaging fourteen feet across and three feet in depth. In them are found charred sandals and baskets, dog burials, and wooden implements. These most primitive Indians we call Basket Makers, because their most marked characteristic is that they made only baskets, whereas all later Indians made both baskets and pottery.

"Being of nomadic origin, these people wandered away, and the community was deserted for about 100 years. When their wandering finally led them back to this spot they had changed their cultural traits by intermixture with more advanced Indians. Those of this period we designate as pre-Pueblo people. They built above the old

are arranged in overlapping circles around the center like the petals of a double rose. They are exhibited in Hall 36.

Professor Record Honored

Two new genera of trees have been named recently in honor of Professor Samuel J. Record of Yale University, who is Research

Associate in Wood Technology for Field Museum. *Recordoxylon amazonicum*, proposed by Dr. Adolpho Ducke of the Botanic Garden of Rio de Janeiro, is a leguminous tree of the Amazon forest. *Recordia boliviana*, named by Dr. Harold N. Moldenke of the New York Botanical Garden, is a member of the Verbena family, and native in Bolivia.

Barite Roses

A recent gift from J. O. Shead of Norman, Oklahoma, has substantially increased the Museum's supply of the curious crystal formations called barite roses. They are groups of barite crystals enclosing sand, and are red in color. Each crystal has the shape of an angular plate, and the plates

CHILDREN'S BOOK ON ANIMALS BY KARL P. SCHMIDT

A beautifully illustrated book on the lives of mammals of North America, entitled *Homes and Habits of Wild Animals*, is now on sale at Field Museum. While it is written in style and language especially suitable for reading by children, it will be found informative and enjoyable by adults also. Karl P. Schmidt, well-known biologist, who is Assistant Curator of Reptiles at the Museum, and holder of a Guggenheim Foundation fellowship in zoology, is the author.

The page size, 10 by 12 inches, makes possible exceptionally large and beautiful color plates, of which there are twelve. These, as well as attractive sketches illustrating various phases of wild animal life which decorate the borders of the sixty-four pages of text, are the work of Walter Alois Weber, an artist formerly on the staff of the Museum.

The book, published by M. A. Donohue and Company, is printed in large clear type, and bound in stiff heavy covers. The multi-colored jacket in which the book comes is strikingly attractive. Copies are available at the Museum at \$1.00 each plus 15 cents for postage if ordered by mail.

Descriptions of Peruvian Plants

In the recently published Volume 5 of *Candollea*, issued by the Botanical Conservatory of Geneva, there appears an article of 57 pages by J. Francis Macbride, Assistant Curator of Taxonomy at Field Museum. It is devoted chiefly to descriptions of new species of Peruvian plants collected by the Marshall Field Expeditions.

Publication of the article in *Candollea* was made possible by the courtesy of Dr. B. P. G. Hochreutiner, Director of the conservatory, whose kindly interest and practical assistance have aided greatly in the joint project of the Rockefeller Foundation and Field Museum for facilitating the study in American herbaria of tropical American plants. The article is dedicated to John L. Albaret, President of the Administrative Council of Geneva, as a tribute to his sympathetic support of the Conservatory, whose rich herbarium holds a unique place among botanical institutions of Europe.

—P.C.S.

THE JUJUBE

By B. E. DAHLGREN
Curator, Department of Botany

The jujube is a fruit almost unknown in the United States. It is produced by a small tree of the buckthorn family, native in northern India and China. It has been in cultivation in Asia for thousands of years, especially in China where it exists in dozens of distinct varieties described by the well-known agricultural explorer Meyer. From India its cultivation has spread to the east coast of Africa and as far as Zanzibar, and to the Mediterranean region where it has been grown for at least two thousand years.

The trees grow best in regions with hot and dry summers and moderately cold winters, such as may be found in the southwestern United States. The best of Oriental jujubes are greatly superior to those grown in the south of Europe.

The fruit is about the size of a small plum. It has a glistening, smooth, light green skin which takes on a characteristically mottled brownish coloring with maturity. The flesh of the ripe fruit is firm and juicy, apple-like in texture but with only a faint suggestion of an apple-like flavor. The

single pit is large and oblong as in the date, and in some varieties is said to be so soft that it may be eaten without being perceived as distinct from the flesh of the fruit. Dried jujubes resemble dates, but are less sweet. The Chinese preserve them by repeated boiling in syrup or honey and drying, or, in the case of certain varieties, by smoking, perhaps the only instance known of fruit being preserved in that way.

The fruiting branch, of which a small part is shown in the accompanying illustration,



Jujube Fruits

Part of a new exhibit in the Hall of Plant Life. The tree from which these edible fruits come is of Asiatic origin.

is of the Chinese variety "sui mem," grown at Davis, California, and reproduced in the Museum for the botanical exhibits. It has recently been installed with other material of the buckthorn family in the Hall of Plant Life (Hall 29).

Spring Blossoms in Autumn

The exceptionally mild weather experienced this autumn in the Chicago region resulted in the flowering of many plants that normally blossom only in spring. This fact has been noted in numerous Chicago newspaper articles, for some of which members of the Department of Botany have supplied details. Associate Curator Paul C. Standley reports that at Gary, Indiana, spiraea bushes were covered with flowers as late as November 11. Large fields of yellow mustard, still flourishing in spite of frosts, were observed in full bloom upon the same date.

Arabian Cleansing Clay

Arabian women in their beauty treatments seem to be up-to-date. The Marshall Field Anthropological Expedition to the Near East collected in Amarah specimens of bentonite, a "cleansing clay," which the women perfume and use to wash their hair, sometimes adding henna. Bentonite has remarkable cleansing powers, but its use for cleansing is, in this country, of comparatively recent origin. It is now used in large quantities in toilet soaps and various other cleansing preparations. The specimen collected by the expedition is shown in Hall 36.

An Illusion

The tall fulgurite or lightning tube shown in Hall 36 appears to many visitors to have the form of a long irregular spiral, which actually it has not. The curve really is so irregular that it reverses itself in places.

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:

Week beginning December 3: Monday—Crystals; Tuesday—Birds of Many Lands; Wednesday—Man Through the Ages; Thursday—General Tour; Friday—Egyptian Exhibits.

Week beginning December 10: Monday—Mexican Archaeology; Tuesday—African Animal Life; Wednesday—Chinese Art; Thursday—General Tour; Friday—North American Indians.

Week beginning December 17: Monday—Looms and Textiles; Tuesday—Native Philippine Life; Wednesday—Races of Mankind; Thursday—General Tour; Friday—Hall of Plant Life.

Week beginning December 24: Monday—The Horse Family; Tuesday—Christmas holiday, no tour; Wednesday—Prehistoric Life; Thursday—General Tour; Friday—Palma and Cereals.

Monday, December 31—Animal Groups.

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 Captain Dache M. Reeves—2 large aerial photographs of Hopewell Mounds, Ohio; from Mrs. Adele L. Grant—77 herbarium specimens, South Africa; from Jesús G. Ortega—223 herbarium specimens, Mexico; from Dr. C. A. Purpus—160 herbarium specimens, Mexico; from the Firestone Tire and Rubber Company—a specimen of rubber latex and a sample of Jelutong rubber; from Charles Merriott—48 clay stones, Michigan; from Edward M. Brigham—an agate geode, New Mexico; from United States Potash Company—a specimen of refined potash, one of malpais lava, and four of silvite, New Mexico; from Missouri Commission to a Century of Progress Exposition—2 barite, 2 hematite, and five blossom rock specimens, Missouri; from Luray Caverns Corporation—2 stalactites, 3 stalagmite deposits, and 6 colored transparencies, Virginia; from Dr. M. A. Perlstein—a garter snake, Illinois; from C. A. Slevin—a tarantula, Arkansas; from Edward Brundage, Jr.—a millipede, 3 centipedes, and 17 insects, United States; from Robert H. Crandall—4 beetles, Arizona; from J. G. Kreer—7 beetles, Arkansas; from Leon L. Pray—a mole, Illinois; from Mrs. Homer Dixon—a horned rabbit; from Henry Dybas—5 earwigs and 33 beetles, Illinois; from Leslie Wheeler—33 birds, Mexico; from H. B. Conover—a green-winged teal, Illinois; from Frank Buck—an East Indian monitor and 2 common iguanas; from Gustav Swanson—8 frogs, Minnesota; from Frank Miller—a green snake, Wisconsin.

NEW MEMBERS

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

Associate Members

Mrs. Charles S. Kiessling, Peter Masterson, Benjamin E. Minturn, Miss Josephine A. Wendell.

Annual Members

Mrs. Frank Baginski, Mrs. Jay Bowman, Mrs. Everett C. Brown, Dr. Eugene Joseph Chesrow, Edward T. Clissold, Secor Cunningham, H. W. Guettler, James Hennessy, Edmund C. Henschel, Dr. Ben H. Huggins, R. Charles Jicha, Mrs. Grace Mathews, Neil McIntosh, W. S. Nicholson, Mrs. Lucius C. Pardee, Mrs. T. D. Payne, Miss Anna Peruchietti, Miss Gayle Pond, Mrs. Michael Pontarelli, Mrs. Carl A. Raulf, C. E. Redfield, Miss Lucy F. Righimer, Ross D. Rynder, Samuel E. Thomason, E. J. Warner, Jr., Algot A. Wickland, Howard L. Willett, Mrs. Margaret Yorkey.

Magnesium

The light weight of the metal magnesium, which is the principal component of down-metal stratosphere balloons, is strikingly shown in Hall 36 where a small piece of iron in one pan of a scale balances a bar of magnesium a foot long.