Field Museum News

Published Monthly by Field Museum of Natural History, Chicago

Vol. 12 JANUARY, 1941 No. 1

NEW HABITAT GROUP SHOWS SEALS AT "UNCLE SAM'S FUR FARM" IN ALASKA

By WILFRED H. OSGOOD
CHIEF CURATOR, DEPARTMENT OF ZOOLOGY

Probably most women who wear beautiful and expensive sealskin coats have rather hazy ideas of the animal which produces them. They may think of sealskin as a very rare and unusual commodity coming from a distant and probably foreign country, perhaps from somewhere near the North Pole. Few suspect that sealskin is to a large extent an American product grown on Uncle Sam's own fur farm in Alaska.

There are many kinds of seals, but those that produce the highly prized fur all belong to one species and live in the north Pacific Ocean. Most of their time is spent on the high seas away from shore, but every summer they gather in immense numbers to rear their young on land, concentrating on a few small islands. There are three distinct herds, two relatively small ones belonging to Japan and Russia, and one very large one belonging to the United States. The summer home of the American herd is on the two small Pribilof Islands, which are only ten or twelve miles in length, and situated far out in the middle of Bering Sea west of the Alaskan mainland. The instinct of the seals to return to the same place year after year is so strong that it has never been violated and not one ever lands anywhere else. The American government, therefore, has made the islands a special reservation where the seals can be controlled almost like domestic animals. In fact, they have an advantage over domestic animals for they feed themselves without cost, living on small fishes and other marine life. Laws and regulations have been made regarding their care, and only the surplus not needed for breeding is taken for fur. Thus it is quite logical to speak of the Pribilof Islands as "Uncle Sam's Fur Farm."

The "home life" of the fur seal is illustrated in a new habitat group placed on exhibition last month in Field Museum's Hall of Marine Mammals (Hall N). The group shows how sealskin coats were intended to be worn—by the seals themselves. And, by the way, more than 2,000,000 seals now have them, that being the size of the present-day herd, whereas only 10,000 women per year are able to obtain real seal coats under the conservation measures in force. The annual permitted kill is 60,000 fur seals, and the average number of skins required for each woman's coat is six.

Containing forty animals, including huge "bulls" as the mature males are called, the much smaller "cows" as the females are known, and young seals called "pups," the group is undoubtedly the largest fur seal exhibit in any museum of the world, as well as being one of the largest groups of any kind of animal in this institution. In addition to the seals, the group contains twenty-four birds representing five species.

Reproduced in the exhibit is a scene representing the barren rocks of the Pribilofs where these animals establish their rookeries. The seals are mounted in life-like attitudes showing them just as they were studied "on location" by Staff Taxidermist C. J. Albrecht, who in 1937 conducted a special expedition to collect them. Since that time, Mr. Albrecht has been engaged in preparation of the group. The background was painted by Staff Artist Arthur G. Rueckert. Mr. Albrecht was enabled to visit the Pribilofs and collect the seals under permits granted by the United States Department of the Interior. He obtained fresh specimens without firing a shot or lifting a harpoon, by selecting what he needed from among the carcasses of those slain through the severe strife that exists among the large bulls during the breeding season. Mr. Albrecht then made necessary plaster casts for taxidermic work, skinned the seals on the spot, and preserved the pelts for mounting.

If their fur was the only interesting thing

"Home Life" of the Fur Seal

Forty animals—"bulls," "cows," and "pups"—are shown in this new group in the Hall of Marine Mammals (Hall N). The seals were collected on the Pribilof Islands by Staff Taxidermist C. J. Albrecht who, together with Staff Artist Arthur G. Rueckert, prepared the exhibit. Some 2,000,000 seals come to these islands each summer to breed.

about fur seals, their story would be a short one. But they have many very peculiar and interesting habits. Most of these are involved in three general characteristics: that of being exceedingly gregarious and gathering in tremendous herds; that of being migratory, making a long regular journey every year; and that of being polygamous to an extremely high degree.

Their gregariousness is evident all their lives, but especially on their breeding grounds where they crowd together by tens of thousands in practically solid masses on the beaches, forming the most stupendous exhibition of mammalian life in the whole world. There is no concealment, and the observer, looking out over the vast mass of great lumbering beasts, feels as if he might have been transported back into some prehistoric age. In early days the American herd was estimated at approximately two million seals. Later there was much wasteful and unregulated killing until, in 1911, the number had dwindled to scarcely more than two hundred thousand. Since then, by means of international treaties protecting the seals on the high seas and good administration on land, the herd has steadily increased until now it again contains about two million animals, and it is steadily increasing. Today there is no waste—even the remainder of the carcasses, after the skin has been removed, furnishes by-products such as penetrating oil, and "seal-meal" used to feed the fish in trout hatcheries.

SEALS MIGRATE TO FAR SEAS

The entire herd spends the summer on the Pribilof Islands, arriving in the spring and departing in the fall on a long migration thousands of miles to the south to spend the winter at sea in the latitude of southern California and Mexico. This is the most remarkable example of migration among mammals, and has all the mystery and fascination of bird migration. The seals go out of Bering Sea past the Aleutian Islands, and then strike south across the broad Pacific, plowing their course against wind, waves, and current with the unswerving directness of a ship guided by compass.

The male fur-seal is four or five times as large as the female, and weighs several hundred pounds. He is called a bull probably on account of his loud bellowing voice, as his size, and his shaggy silver-tipped coat, give him more resemblance to a short-legged waddling grizzly bear. On the breeding grounds his disposition is ferocious, blustering, and domineering. The female, or cow seal, on the other hand, is quite the reverse —small and slender, with a mild and gentle disposition and a manner sometimes almost coy and confiding.

Early in the spring the old bulls come to the islands and station themselves at intervals along the boulder-strewn beaches. For some days or weeks the solitary bulls wait. When the females come, a little later, they gather in groups quite appropriately called "harems," each of which is presided over by an old bull. These harems vary in size from four or five to forty or fifty and, sometimes, even seventy-five or one hundred females to one male. The average number is about forty. The bulls guard these harems most jealously and are kept busy day and night. They do not fight to get the cows, for these come to them voluntarily, but they certainly fight to keep them, and sometimes it is a struggle to the death. The bull who gets the most cows is not necessarily the best looking or strongest, but more likely the one that has the most favorable position on the beach as the cows come in. Therefore, it is the female who does the choosing among seals; but if she doesn't like her choice she is obliged to put up with it nevertheless, for if she tries to leave, the bull is instantly after her and likely to "treat her rough." The harems, when full, present a wonderful sight. Each big burly bull, thick-necked, shaggy, and defiantly dignified, sits surrounded by a company of sleek, soft-coated and liquid-eyed females, swaying their graceful bodies sinuously from side to side, slowly closing their eyes and dozing, or playfully snapping at each other. If a nearby bull sneaks in with the idea of segregating some of the cows for himself, this peaceful scene changes and a fight is on, but possession seems to be "nine points" in most cases.

A bull dares not leave his harem unguarded for it would immediately be appropriated by another, so he is obliged to remain in his place without food and practically without rest for the long period of six to nine weeks during which more cows continue to come in, young seals are born, and domestic affairs go on. His long-continued strength and vigor without food is unparalleled among mammals. At the beginning of the season, he is in magnificent physical condition, full-bodied, thick-necked, quick-moving, arrogant, and vigorous. Little by little he becomes thinner and thinner until, at the end, he is scarcely more than a shadow of his former self. He then retires to sleep continuously for several days, after which he goes to sea to feed and recuperate.

THE "PUPS" ARE PLAYFUL

Each of the cows has one young, and one only—twins are unknown. Although its sire is called a "bull" and its mother a "cow," the young fur-seal is called a "pup." It is only necessary to see one to appreciate the appropriateness of the name. The pup's hair is short, crinkly, and glossy black, quite different from the rich warm brown of older seals. Its face is wrinkled and its expression most serious, so, altogether, it suggests the young canine very decidedly. After the early part of the season, every seal rookery includes a very large number of pups. They are everywhere from the waterfront to the caves and crevices at the extreme rear of the rookery. Like the young of most mammals, they have cute ways, running from the ludicrous to the pathetic. They remain on land some five or six weeks, nourished by their mother's milk and growing rapidly. Then they begin to take to the water to swim, and when the herd goes south in the fall they shift for themselves. At this time they are killed in large numbers by a voracious, toothed whale known as the killer. These killers have been seen to dash into a school of small seals and literally cut them to pieces, tossing them into the air, and rushing about in a frenzy.

FUR COATS COME FROM "BACHELORS"

A very important class of fur seals includes the young males from two to six years of age, called "bachelor seals." They are celibates by force rather than from choice, for they are rigidly excluded from the breeding grounds by the ferocious old bulls. True to their gregarious instinct, the bachelors gather on land adjacent to the breeding grounds and play.

It is from these adolescent seals that our sealskin comes. About as many males as females are born but, on account of the polygamous habit, a large percentage of the males are unnecessary for breeding purposes. Therefore, these superfluous males are taken for their skins, and, since females are always preserved, this has no effect on the growth and continuance of the herd. Thus it is possible to manage the seals much as a stockbreeder does a herd of cattle or sheep.

Since the purchase of Alaska by the United States in 1867, some 4,000,000 fur seals have been killed on the Pribilof Islands for their skins. From these the government has received a revenue of nearly $15,000,000 in addition to the very large profits obtained by the private companies to whom for forty years the sealing privilege was leased.

KILLING IS STRICTLY SUPERVISED

The seals are killed in a humane manner, under supervision of government agents, by experienced "natives" (Eskimos, Indians, Scandinavians, and other inhabitants of the islands) who have grown up in the sealing business. The bachelor seals are naturally segregated in separate areas, and when they are desired for killing, the sealers simply run between them and the water. On being thus cut off from their retreat, they start up, huddle together, and then may be guided in any desired direction. Because they proceed more slowly, they are easier to manage than any domestic animal.

Removing the skin is a simple process accomplished by experienced hands in a few minutes. After cooling, the skins are taken to what is called the "salthouse," and here each is rolled in coarse salt and laid away. A week later, they are resalted, spread flat with folded edges, and packed in solid masses between thin layers of salt. In this condition they keep well indefinitely and are thus transferred to ships and sent to market in the United States and elsewhere.

DR. W. H. OSGOOD RETIRES FROM ACTIVE SERVICE; KARL SCHMIDT IS NEW ZOOLOGY CHIEF

Dr. Wilfred Hudson Osgood, for more than thirty-one years a member of the staff of Field Museum, and, since 1921, Chief Curator of the Department of Zoology, retired from active service on December 31. He will remain, however, as Chief Curator Emeritus, and the Museum will thus continue to enjoy the benefit of his broad knowledge and valued service. He plans to complete a number of important research projects in which he has long been interested.

Dr. Osgood is a graduate of Leland Stanford University, and took his Ph. D. degree

Blackstone photo
Dr. Wilfred H. Osgood

Moffett photo
Karl P. Schmidt

in 1918 at the University of Chicago. Before coming to Field Museum he was engaged as Assistant Biologist in the United States Biological Survey for twelve years, thus making a total of forty-three years in zoological work. Dr. Osgood joined the staff of Field Museum on July 1, 1909 as assistant curator, and became head of the Department of Zoology in 1921.

Recognized in scientific circles as one of the country's foremost zoologists, Dr. Osgood is in addition a well-known lexicographer and a contributor to encyclopedias.

Dr. Osgood has led many important expeditions for Field Museum, in South America, Africa, and Asia. Among the most important were the Marshall Field Expedition to Chile in 1922–23, the Magellanic Expedition of Field Museum which in 1939–40 explored and collected in the southernmost reaches of South America rounding out the explorations of 1923, and the *Chicago Daily News*–Field Museum Abyssinian Expedition in 1926–27. Dr. Osgood personally financed and conducted an expedition to French Indo-China in 1937 with resulting large and important additions to the Museum's zoological collections, and in recognition of this contribution the Board of Trustees elected him a Contributor. His researches and scientific publications are extensive, and are internationally known, and he is author also of several charming books for lay readers.

As a master of museum technique Dr. Osgood has few peers, and to his knowledge of zoology, and his "special sixth sense" of what constitutes an exhibit which will successfully accomplish its mission of education, may be traced much of the excellence which characterizes Field Museum's zoological halls today. In him are combined the qualities of the research scientist, the educator who can transmit knowledge to adult and child layman alike, and the critic, artist, and philosopher. He possesses the ability to direct others in the creation of such a work as a habitat group, and the highly sensitive qualities of perception which enable him to recognize unerringly when his or their work is (or is not) "just right." As an editor, his judgment and counsel in the preparation of scientific books and papers, and written material for the layman also, has benefited every member of the staff of his department and won their highest respect. This is particularly notable in regard to the preparation of the texts for exhibition labels, which is indeed a special and exacting separate art, not comparable to most other forms of written expression, since these labels must tell so much so exactly in so few words.

Beyond all that may be said of Dr. Osgood's inherent abilities, his wide knowledge and experience, and his accomplishments, there stand even more prominent his personal charm and his kindly and sympathetic nature, which have endeared him not only to the members of his own department, but to every man and woman on the staff of the entire Museum. It is a pleasure to all of them to know that, although he is passing the reins of active departmental direction to younger hands, he is still to remain among them as a scientist, as a Field Museum personality, and as a friend.

K. P. SCHMIDT IS SUCCESSOR

Successor to Dr. Osgood as Chief Curator of the Department of Zoology is Mr. Karl P. Schmidt, whose appointment to that post becomes effective January 1, 1941.

A graduate of Cornell University, Mr. Schmidt was connected with the American Museum of Natural History, New York, as Research Assistant and Assistant Curator of Herpetology from 1916 to 1922. In the latter year he joined the staff of Field Museum as Curator of Amphibians and Reptiles. He has attained an international reputation as one of the foremost specialists in the study of amphibians and reptiles. In addition, he has a broad background of knowledge in other branches of biology and geology, and has made significant contributions to the general field of animal geography. He has participated in many Field Museum expeditions, notably the Marshall Field Expeditions to Central America in 1923, and to Brazil in 1926, and he was leader of the scientific staff on the Cornelius Crane Pacific Expedition (1928–29), one of the largest expeditions in the history of the Museum. In 1939–40 he accompanied Dr. Osgood on the Magellanic Expedition. He is the author of many technical papers, and also of books for laymen.

C. H. POPE IN HERPETOLOGICAL POST

Mr. Clifford H. Pope, appointed Assistant Curator of Amphibians and Reptiles during the past year, takes Mr. Schmidt's place as Curator of that division. He has had a notable career as scientific collector and traveler in China, and is especially well-known for popular books on reptiles which rank among the "best sellers" of scientific literature. He is recognized as the principal authority on Chinese amphibians and reptiles.

PERMANENT APPOINTMENT TO DR. DROUET

Dr. Francis Drouet has been given a permanent appointment as Curator of Cryptogamic Botany, following his completion of a two-year temporary appointment begun in 1938. During the first two years of his association with the Museum, Dr. Drouet has begun reorganization of the collections of cryptogamic plants in the Department of Botany, and has conducted an expedition to the American Southwest and Mexico.

D. D. DAVIS PROMOTED

Mr. D. Dwight Davis, has been promoted, effective from January 1, from Assistant Curator to Curator of Anatomy and Osteology. He joined the Museum staff in 1930

Clifford H. Pope

Francis Drouet

as an Assistant in Osteology. He has conducted numerous research projects, and was a member of an expedition to the Chisos Mountains in southwestern Texas in 1937, and of the Leon Mandel Caribbean Expedition in the early part of 1940.

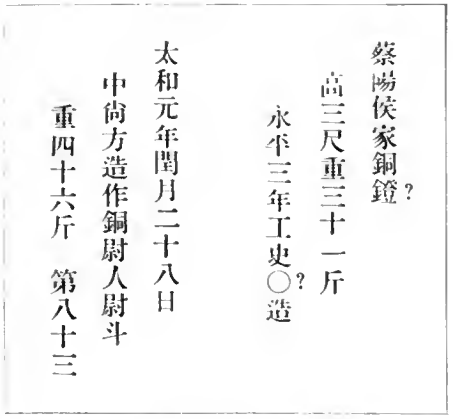
OTHER PERSONNEL CHANGES

Mr. Loren P. Woods, who joined the staff as a guide-lecturer in the Raymond Foundation in 1938, has been transferred to the Department of Zoology where he will be Assistant Curator of Fishes. Mr. Paul O. McGrew, an Assistant in Paleontology since 1938, has been promoted to Assistant Curator of Paleontology.

HIDDEN INSCRIPTIONS—Discovery Leads into Ancient Politics, Tax Frauds, Even Clothes Pressing

BY C. MARTIN WILBUR
CURATOR OF CHINESE ARCHAEOLOGY AND ETHNOLOGY

In Peking, just before returning from the Blackstone Expedition to China (1910), the late Dr. Berthold Laufer, former Curator of Anthropology at Field Museum, secured four bronzes reported to have been excavated that very year in the prefecture of Honan. Two were nearly identical stands, each having a heavy, semi-globular base and a tall stem surmounted by a squatting bear; underneath one bear was a three-word inscription meaning "Number 18." In his notes Dr. Laufer wrote: "Unique; nothing



These Tell the Story

Two inscriptions (here shown in modern Chinese characters) which were discovered on ancient Chinese bronzes at Field Museum during reinstallation of exhibits. The earliest (A.D. 60) begins at the upper right. In the originals, each inscription was a single column of characters. Translations, and an analysis of their significance, will be found in the accompanying article.

like them illustrated in Chinese archaeological books. Han." The Museum has exhibited these rare stands for thirty years.

Bronzes excavated in China often have a crust of earth adhering with such cement-like firmness as to be almost a part of the patina. Because some bronzes removed from exhibition to make room for a lacquered wooden grille (described in the last issue of FIELD MUSEUM NEWS) seemed never to have been entirely cleaned of this crust, Mr. Darwin Hanson, a preparator, volunteered to make them more presentable. By lucky chance, on the very second day of scraping and picking, he discovered an inscription cut into the base of the supposedly uninscribed bear-head stand, and a hasty translation showed it to be dated.

While this discovery was being studied, Mr. Hanson examined the other bronzes to see whether any of them, too, had unsuspected writing. He soon found evidence of a second inscription on another of the four Honan bronzes, this one purportedly a lamp. This inscription was also incised, but its very thin line was almost imperceptible, due to the heavy crust of earth and coarse patina. So shallow was the cutting that there was danger of destroying the inscription during cleaning. Mr. Robert Yule, Assistant in the Department of Anthropology, whose native language is Chinese, undertook this delicate task. Constantly using a magnifying glass, he carefully scraped off patina with dilute acid and a scalpel, and slowly cleaned out the lines of the Chinese characters, frequently stopping to consult with the writer and Mr. Charles Hu, an expert on forms of ancient Chinese writing. By comparing doubtful characters with similar ones in published rubbings of Han bronze inscriptions, strokes were detected which might otherwise have been missed.

Only a few Chinese bronzes are inscribed, and of Han inscriptions not many are dated. Specimens with genuine dates are guideposts for dating uninscribed pieces of similar style. Field Museum, by discovering two dated inscriptions, has thus added to the data upon which antiquarians build their stylistic chronology. The inscription on the second and older piece translates as follows: "Bronze sacrificial stand [or lamp?] of the household of the Marquis of Ts'ai-yang. Height, three [Chinese] feet; weight, 31 *chin*. Made by workman Shih in the third year of *Yung-p'ing*." This tells what the object is, its height and weight in Chinese measure, who owned it, who made it, and when it was made.

ANCIENT POLITICAL SLOGANS

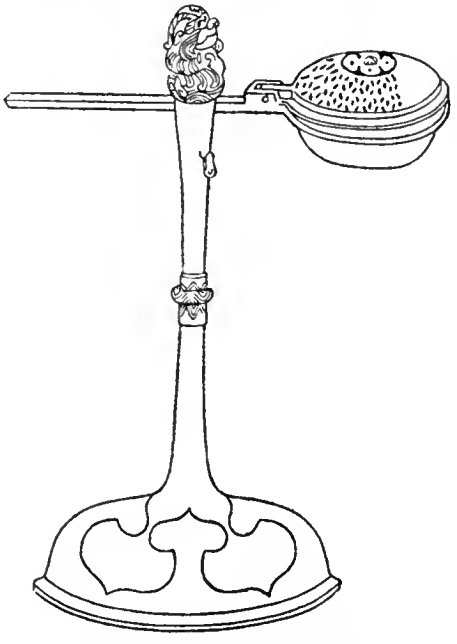
Yung-p'ing is the name of a "reign period." From Han times on, each emperor selected a name to typify his reign. If some happy event worth commemorating occurred, or if things were going badly, he quickly adopted a new name. If in America we reckoned by a chronology based on campaign slogans such as "A chicken in every pot," "Every man a king," or "The New Deal," the situation would be analogous. During the 2,000-odd years under this system there were some 800 reign periods in China. However, favorite titles were chosen over and over, and unless the name of the dynasty is given it is not always possible to say what date is represented. The term *Yung-p'ing*, "Everlasting Peace," was adopted three times: in A.D. 58, 291, and 508. Since there was no third year for the second reign, the alternative dates are A.D. 60 and 510. Two things indicate the earlier of these. The style of characters is "archaic," like that of Han times, but different from that of the sixth century; and the measures of height and weight tally closely with known Han measures.

Chinese weights and measures were standardized in A.D. 9, about the middle of the Han period (206 B.C. to A.D. 220). Some of the standards still exist, and we know the system on which they were based. Consequently, Dr. Homer H. Dubs, translator of the *History of the Former Han Dynasty*, has been able to compute Han measures in Occidental terms. The inscription says the stand is 3 feet high. In A.D. 9 the "foot" was 9.094 English inches, so our stand should measure 27.282 inches—it is actually 27.937, a discrepancy of less than three-quarters of an inch. The Han *chin* weighed approximately 8.6 ounces, so a piece weighing 31 *chin* should be about 266.6 ounces. The present weight is 260 ounces. The loss could be accounted for by the destructive effects of long burial.

HOW TAX INCREASES WERE HIDDEN

This close correlation between the inscribed height and weight and the actual measures helps confirm the earlier date in the following way. Chinese weights and measures were increased slowly after A.D. 9 until now the Chinese foot is 14.1 English inches, while the *chin* weighs one and a third pounds, instead of 8.6 ounces. One of the reasons is interesting. Taxes in grain were paid in measures of capacity, and those in silk were paid in bolts of established length and width. By the expedient of officially increasing standard measures, customary taxes could be increased without altering the tax structure. This is the opposite of "short weighting," but the principle of fraud is the same. The standard measures of the sixth century are not known, but it is most unlikely that they still conformed so closely to the middle Han standards as do the measures which appear on the bronze.

Since the names of both maker and owner are given, the sacrificial stand (or lamp) was probably made on order for the Marquis by workman Shih. There is no hope of learning more about workman Shih, but in



Pressing Stand and Brazier

Copy, from a woodblock in a Chinese antiquarian's book, of the only illustration so far found of a complete set. The brazier resembles modern Chinese "irons" for pressing clothes. Heat is provided by burning charcoal placed in the cup. The stand holds the dangerously hot working part when not in use.

the unindexed *History of the Latter Han Dynasty* there may be a reference to that Marquis of Ts'ai-yang who lived in A.D. 60.

The inscription discovered on the bear-head stand reads: "On the twenty-eighth day of the intercalary month of the first year of *T'ai-ho*, the Central Imperial Atelier made this bronze pressing man [i.e., stand] and pressing brazier. Weight 46 *chin*. Number 82."

The Imperial Atelier made furniture of all kinds for palaces. *T'ai-ho*, "Great Harmony," was used four times in Chinese history, the dates of adoption being A.D. 227, 366, 477, and 827. The first three each had an intercalary month during the first year, so only the last can be eliminated for lack of one; but judging from historical facts, style and content of the script, decorative treatment of the stand, and the opinion of Chinese antiquarians, the first date is the more probable. If this is correct, the stand was made on February 21, A.D. 228 (the intercalary month came at the end of 227, or actually in the next year by our solar calendar). The weight is of no value in checking, because it probably referred to the combined weights of stand and brazier, and the latter is missing.

USED TO PRESS CLOTH, OR WARM BED

What do the terms "pressing stand and pressing brazier" signify? A possible answer is provided by the accompanying illustration, which is the only one so far found of a complete stand and brazier set. It appears in the *Liang lei hsien i ch'i t'u shih* by Wu Yün, an antiquarian of the last dynasty; the original bore an inscription with a date probably corresponding to A.D. 229.

In this drawing the long handle of a brazier rests in the hole cut through the stand just below the ornamental bear. This brazier resembles modern Chinese "irons" for pressing clothes, except that the latter have shorter handles. For heat, burning charcoal is placed in the cup. Long handled objects of the sort, but without covers, from Han times, are figured in many Chinese antiquarian works and often called by the modern term for irons. Full of burning charcoal, a Chinese iron gets very hot, and when not in use it must be set on something that will not scorch. One with as long a handle as shown in the illustration would tip over easily; therefore a stand with a broad heavy base would be a suitable holder. Our stand was certainly made to hold a long-handled pan or brazier, but was the pan actually used for ironing? Judging purely from appearance, the brazier could have been used equally well as an old-fashioned radiator or a bed-warmer.

Chinese paintings of every-day life help to visualize the past. One of the earliest known, now in the Boston Museum of Fine Arts, is an eleventh century copy of an eighth century original. It pictures Chinese women preparing silk. One of them is pressing cloth with a long handled brazier, while nearby a small girl fans a charcoal stove. Close to it is a stand with a broad, semi-spherical base and long stem, corresponding almost exactly in shape to Field Museum's inscribed one. It seems significant that a brazier for ironing and a stand closely similar to Field Museum's much earlier one appear together in a scene largely devoted to pressing cloth.

Dr. Laufer correctly recognized this stand as rare. The great Chinese antiquarian Jung Keng, who has probably handled more ancient Chinese bronzes than any other authority, had up to 1933 apparently never seen a complete set. In connection with his own brazier cover, exactly like that figured by Wu Yün, he mentions Wu Yün's illustration. He cites also a stand figured in the *Hsu k'ao ku t'u*, two upper halves of stands in the Eumorfopoulos collection, and another he once saw on the Peking market. Add to his list a few more illustrations, one actual stand which might be the piece he saw in Peking, and now Field Museum's two stands, and you have the approximate total of known specimens. This rarity is perhaps surprising since the Museum's specimens were respectively the eighteenth and eighty-third of the sets in which they were made. Such is the mortality rate on ancient Chinese bronzes.

Curator S. K. Roy Returns from Geology Expedition

The physical geology exhibits at Field Museum will be greatly augmented in scope as the result of specimens obtained by Mr. Sharat K. Roy, Curator of Geology, who returned in December from an expedition of more than three months, collecting in both western and eastern states. Various localities in Wyoming, Colorado, South Dakota, Virginia, New Jersey, New York, Massachusetts, and Connecticut were combed by Mr. Roy in his search for rock specimens demonstrating the subject of structural and dynamic geology. During part of the expedition's work Mr. Roy was accompanied by Assistant Curator Henry Herpers.

Another Contribution Received from Mrs. James N. Raymond

In December, for the third time during 1940, Mrs. James Nelson Raymond made a contribution of $2,000 to the Museum for the support of the activities of the James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures, which she founded and endowed in 1925. The Foundation is constantly increasing the scope of its services to the schools and the children of Chicago, and the continued generosity of Mrs. Raymond makes possible extensions of activities which would not otherwise be possible.

THINGS YOU MAY HAVE MISSED

A What-is-it Puzzle From Ancient Kish

Among the bronze rein rings excavated, with other relics of chariots, from tombs at the ancient city of Kish by the Field Museum-Oxford University Joint Expedition, and now on exhibition at the Museum in the Hall of Babylonian Archaeology (Hall K), is one decorated with the unusual figure of an antlered ruminant. It dates to about 2900 B.C. Just what animal the ancient Sumerian artist modeled is today a puzzle equally to archaeologists, paleontologists, and zoologists, and remains open to wide speculation. Museum visitors may find diversion in studying it and offering their own answers.

Bronze Rein Ring (Kish—2900 B.C.)

One suggestion that has been made is that it may represent a deer (possibly a species of the family Cervidae unknown to modern zoologists), shown hobbled as it was allowed to graze in the private zoological park of some Kish noble. Another theory, supported by the presence of two sets of horns, is that the figure depicts a survival of a genus of giraffe now extinct, known to paleontologists from fossils associated with the Pleistocene period (which began one to one and one-half million years ago), and designated by the name *Sivatherium*. Individuals of this giraffe group might have persisted in the Kish area after passage over their migration route from India to Africa, it is reasoned, and thus may have become known, or even captured and domesticated, by the Sumerians. Again, the rein ring may be an attempt by the artist to depict a giraffe merely from hearsay. The giraffe (*Giraffa camelopardalis*) was known in prehistoric Egypt, and a Sumerian sculptor, hearing about it, might have utilized the familiar deer for a model, adding the frontal horns. In this case, a plausible explanation of the short neck of the animal in the rein ring would be that the artist doubted the veracity of his informant, as well he might if he had never seen the animal in life.—R.A.M.

A model illustrating what is known of the internal structure of the earth is exhibited in Clarence Buckingham Hall.

Field Museum of Natural History
FOUNDED BY MARSHALL FIELD, 1893
Roosevelt Road and Field Drive, Chicago
TELEPHONE: WABASH 9410

FLORIDA TREE-SNAILS

BY FRITZ HAAS
CURATOR OF LOWER INVERTEBRATES

The strikingly colored snails of the genus *Liguus* are a most conspicuous feature in the fauna of southern Florida. Although represented there by numerous species and races, they are not aboriginal inhabitants of the area they now occupy, but are immigrants (rather recent, in a geological sense) from Cuba, where the genus may have originated.

An exhibit of these odd snails has been added to the Hall of Lower Invertebrates (Hall M). The specimens were collected by the Field Museum Florida Expedition (1939), conducted by Staff Taxidermist Leon L. Walters and the writer. Mr. Frank H. Letl, Preparator of Accessories, modeled the soft parts and accessories for the exhibit.

The *Liguus* snails are especially interesting, not only because of the almost unbelievable variation of colors and patterns shown by their shells, but also because of their quite unusual way of living. The beauty of the shells, which may be observed in the Museum exhibit, has attracted many Florida amateur biologists into specializing on the collecting and study of *Liguus*. They have even created a new word for their hobby—they call the collecting of these snails "ligging." This "ligging" is quite different from ordinary shell collecting, for the *Liguus* do not live on or beneath the ground, as most of our native snails do, but on trees. The Museum exhibit shows them in characteristic habitat on a branch of gumbo limbo tree.

The haunts of these snails are principally in the Everglades—not the low swampy parts, but the dry and mostly wooded higher hills called "hammocks." Since these hammocks are usually widely separated from each other, and since the tree-snails, even if they come down to the bottom, cannot migrate from one hammock to another, isolation has created different races of *Liguus* on almost every one. Due to the lumber industry, part of the hammocks have lost their trees, and with the disappearance of trees, various races of tree-snails which had dwelt on them have been exterminated.

Though an arboreal animal, the tree-snail does not feed on the leaves of its host tree, but exists by devouring the mushrooms, lichens and other outgrowths on the tree's bark. It never leaves the tree it has chosen, but late in August or in September it crawls to the ground, burrows into the leaf mould or moss, and deposits its eggs which occur in clusters of from four to eight. A tree-snail must have attained an age of at least three years to perform this act of propagation. It is not known whether, after having laid its eggs, a snail returns up the tree again to live there another year and then repeat the act of egg-laying, or if it inevitably dies after the first time. The eggs themselves, slightly kidney-shaped and of pea-size, remain hidden in the mould for about six months, until the warm rains of spring cause them to hatch. Once out of their egg-shell, the young tree-snails crawl on the ground until they select a tree for a home. Climbing up the trunk, they settle there or on a branch to complete their growth and ultimately continue the cycle of life. But the *Liguus* are not active over all this time, for during the hot and dry months they retire into their shells which they glue to the bark or the leaves by means of a quickly hardening slime. When moistened by the fall rains, the slime softens quickly and releases the snails.

COLOMBIAN PLANTS STUDIED

Field Museum received recently on loan 200 sheets of plants belonging to the coffee or quinine family, gathered ninety years ago in the mountains of Colombia by José Triana, pioneer collector of plants of that country. The collection, now the property of the Instituto Botánico of Bogotá, was sent by courtesy of Dr. José Cuatrecasas of that institution, formerly director of the Botanic Garden of Madrid. The series was studied and determined by Mr. Paul C. Standley, Curator of the Herbarium, who is particularly interested in this large family of plants. The specimens proved to be of exceptional scientific interest because many of them were collections from which new species have been described. A very large number of new Colombian species was described from the Triana collections, the largest representation of which is at Paris, where they were studied and described by Triana and the French botanist Planchon.

With the Triana collection, there was received from Bogotá, for deposit in the Herbarium of Field Museum, a fine series of plants of the same family (Rubiaceae), obtained in the course of the extensive botanical explorations now being conducted in various remote parts of Colombia by investigators for the Instituto Botánico.

NEW MAMMAL EXHIBIT

The desert portions of Mongolia are inhabited by an interesting species of wild ass, a specimen of which has just been placed on exhibition in Hall 15. The desert vegetation of scattered bunches of grass and various bushes supplies food, but water is scarce and these animals may live for some time without it.

The Mongolian wild ass gathers in herds of thousands just before the young are born, later on splitting up into smaller bands. The goitered gazelle often associates with the wild ass to form curiously mixed groups.

The Museum's specimen was received from the Asiatic Expedition of the American Museum of Natural History, New York, as part of Field Museum's share in the collections. Dr. Roy C. Andrews, leader of the expedition, writes that a wild ass pursued in a car averaged thirty miles an hour for sixteen miles, and was not caught until it had run twenty-nine miles. The specimen was prepared for exhibition by Staff Taxidermist Julius Friesser.—C.C.S.

One of the most important "strategic materials" today is rubber. In Hall 28 of the Department of Botany is an exhibit including many of the principal varieties of the crude material, showing how those from widely separated localities differ.

A FEW FACTS ABOUT FIELD MUSEUM

Field Museum is open every day of the year (except Christmas and New Year's Day) during the hours indicated below:

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

Free courses of lectures for adults are presented in the James Simpson Theatre on Saturday afternoons (at 2:30 o'clock) in March, April, October, and November.

A Cafeteria serves visitors. Rooms are available also for those bringing their lunches.

Chicago Motor Coach Company No. 26 busses provide direct transportation to the Museum. Service is offered also by Surface Lines, Rapid Transit Lines (the "L"), interurban electric lines, and Illinois Central trains. There is ample free parking space for automobiles at the Museum.

IN MEMORIAM

Edmond Narcis Gueret

1859–1940

In science, as in other walks of life, it is the lot of many to be laborers in the vineyard. No revolutionary discovery or novel idea focuses attention upon them. Theirs is the less spectacular, but scarcely less important, job of providing with delicately trained fingers the materials without which clumsier hands would be helpless.

One of these was Edmond N. Gueret, who for sixty-five of his eighty-one years had one unvarying goal—the preparation of animal skeletons and special osteological dissections that layman and scientist alike would recognize as the best that human fingers could devise. The teaching materials in a dozen medical schools, the halls of osteological exhibits in many museums and especially in Field Museum, and innumerable preparations in Field Museum's research collections will be a lasting monument to his skill.

Photo by J. Bayalis
Edmond N. Gueret

Mr. Gueret was born at Saumur, France, in 1859—the year made notable by the publication of Charles Darwin's revolutionary *Origin of Species*. He came to this country as a child, and at the age of fifteen began a career that was to last for twenty-five years at Professor H. A. Ward's Natural Science Establishment in Rochester, New York. "Ward's" was one of the first biological supply houses in America, and became an incubator for a whole brood of men who later dominated an astonishing variety of fields. Mr. Gueret was one of the last survivors of this extraordinary group. It is curious that his entire career was determined by one of Professor Ward's many eccentricities—his firm conviction that only a Frenchman had the makings of a thoroughgoing osteologist.

Mr. Gueret accompanied the enormous collection exhibited by Professor Ward at the World's Columbian Exposition in 1893, and assisted in installing it. In 1900, after the collection had been purchased as a nucleus for the newly-organized Field Museum, he joined the staff of this institution as osteologist. Thus he was associated with the Museum throughout most of its entire existence to date.

From the 45-foot right whale to the tiny ruby-throated hummingbird, nearly every skeleton exhibited in Hall 19 was mounted by Mr. Gueret. Scientists for generations to come will thank him for dozens of beautiful preparations in the research collections of the Division of Anatomy.

His colleagues will long remember Mr. Gueret for his unfailing good humor, his extraordinary kindness, and his devotion to his chosen work. In truth, he had no enemies and every man was his friend.

—D.D.D.

Staff Notes

The degree of Doctor of Philosophy was conferred on Mr. Alexander Spoehr, Assistant Curator of American Archaeology and Ethnology, by the University of Chicago at its quarterly convocation held December 17.

Dr. B. E. Dahlgren, Chief Curator, Department of Botany, has returned to his post at the Museum after an extended trip to Brazil.

Mr. Emmet R. Blake, Assistant Curator of Birds, has been appointed chairman of the field committee of the Chicago Ornithological Society, and is conducting groups of members on field trips during weekends to study the local birds of the Chicago area.

Mr. Rudyerd Boulton, Curator of Birds, recently lectured before the Zoology Club of the University of Chicago on "Problems in West Indian Ornithology." Staff Taxidermist John W. Moyer lectured on "Making the Dead Appear to Live," before the School Assembly Service. Mr. Bryant Mather, Assistant Curator of Mineralogy, spoke before the Chicago chapter of the American Gem Society on "Diamonds in the United States." Dr. Julian A. Steyermark, Assistant Curator of the Herbarium, lectured on "Introducing American Plants into American Gardens" before the Midwest Horticultural Society, and on "Exploring Guatemala for Plants" before the Men's Garden Club of Chicago.

Gift from Chief Curator Nichols

Mr. Henry W. Nichols, Chief Curator of the Department of Geology, has presented the Library of the Museum with a valuable collection of scientific journals from his personal library. In most cases the files of the periodicals are complete. Among the publications included are *Chemical Abstracts, Mining and Metallurgy, Journal of the Western Society of Engineers, Technology Review, Mining Technology, Transactions of the American Institute of Mining and Metallurgy, Journal of Industrial and Engineering Chemistry,* and *Scientific Monthly.*

Michigan Librarians Visit Museum

Sixty-five librarians from various cities and towns in Michigan, recently brought to Chicago for a week's visit by the W. K. Kellogg Foundation, spent part of one day at Field Museum. They expressed a keen interest in the Museum's activities, especially the work being done for children.

1,200 RADIO EDUCATORS STUDY MUSEUM PROGRAM METHODS

In recognition of the excellence of the radio follow-up work of the James Nelson and Anna Louise Raymond Foundation of Field Museum, in co-operation with the Radio Council of the Chicago Public Schools, the Museum was invited to present a demonstration of its type of program before the Fourth Annual Broadcast Conference held in Chicago on December 5. Twelve hundred delegates from all over the country attended. Miss Miriam Wood, Chief of the Raymond Foundation, represented the Museum, and gave the demonstration.

"4-H" Club Farm Boys and Girls On Annual Visit to Museum

During the week of December 2 many of the thousands of people from all over the country attending the International Live Stock Exposition also visited Field Museum. Some came singly, some in groups, large and small. As in past years, selected representatives of the rural boys and girls, brought to Chicago by the National Congress of 4-H Clubs, visited the Museum. On December 3 more than 770 girls were conducted on Museum tours by members of the staff of the James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures, and on December 5 some 750 boys were given similar service.

The N. W. Harris Public School Extension of the Museum also co-operated by installing several of its traveling exhibits at the Live Stock Exposition.

Guatemala Expedition Progresses

Mr. Paul C. Standley, Curator of the Herbarium, reports favorable results thus far from the botanical expedition which he is conducting in Guatemala. Since arriving in that country in October, Mr. Standley has collected in various portions of the Oriente, including the Departments of Zacapa, Chiquimula, Jutiapa, Jalapa, and Santa Rosa. In less than two months' collecting almost 5,000 numbered collections have been obtained. These will form a most important supplementary series for comparisons and additions to specimens previously brought from Guatemala by Curator Standley and Assistant Curator Julian A. Steyermark.

Trustees Honor Mrs. F. S. Fish

Mrs. Frederick S. Fish, of South Bend, Indiana, and New York, was elected to the Museum's list of Contributors at a recent meeting of the Board of Trustees. This honor was in recognition of a notable gift of carved marble lions from China, presented by Mrs. Fish, and now on exhibition in George T. and Frances Gaylord Smith Hall (Hall 24, Chinese Archaeology).

CAVE MAN IS THE SUBJECT OF SUNDAY LECTURES

"Digging Up the Cave Man's Past" is the subject of the Sunday afternoon lectures to be presented at Field Museum during January by Mr. Paul G. Dallwig, the Layman Lecturer. The lecture will be illustrated with the life-size dioramas of various types of prehistoric man in the Hall of the Stone Age of the Old World. Mr. Dallwig will trace for his audiences the physical evolution of man, and his cultural development through the Old and New Stone Ages. Special attention will be given to prehistoric art. Dramatizing various phases of his story, Mr. Dallwig will conduct his audience on an intimate visit to the Neanderthal family in their cave home. The mode of living, and various incidents typical of the lives of these and other early races of man, will be outlined in vivid style, and Mr. Dallwig will reconstruct the story of a romantic tragedy deduced from study of the skeleton of a Magdalenian woman.

To meet the demands for accommodations, the same lecture will be presented on each of the four Sundays of the month (January 5, 12, 19, and 26). Lecture audiences assemble promptly at 2 P.M. Because the number that can be conducted among the exhibits under comfortable circumstances on a lecture of this type is limited, it is necessary to make reservations for all Sunday lectures well in advance. This may be done by mail or telephone (WABash 9410). Children cannot be accommodated. The lectures last until 4:30 P.M., but midway there is a half-hour intermission. During this interval those who desire to smoke or obtain refreshments may do so in the Cafeteria, where special tables are reserved for the group.

In February Mr. Dallwig's lectures will be on "Nature's 'March of Time'," dealing with prehistoric animals, and will be illustrated by the exhibits in the Hall of Historical Geology (Ernest R. Graham Hall). Reservations for February are currently being taken.

GIFTS TO THE MUSEUM

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

Department of Anthropology:

From University of Illinois, College of Dentistry, Chicago—a skull of male white American; from Stanley Field, Chicago—17 photographs of the Ward African bronzes in the United States National Museum.

Department of Botany:

From Dr. P. A. Munz, Claremont, Calif.—41 herbarium specimens, South America; from Bill Bauer, Webster Groves, Mo.—201 herbarium specimens, Missouri, Illinois, and Kentucky; from Julian A. Steyermark and Paul C. Standley, Chicago—125 herbarium specimens, Illinois; from W. A. Daily, Cincinnati—68 specimens of Myxophyceae, Ohio and Kentucky; from University of Texas, Austin—125 herbarium specimens, Mexico.

Department of Geology:

From Henry Herpers, Chicago—3 microslides of minerals, Pennsylvania; from R. R. Becker, Gainesville, Fla.—18 groups of fish teeth and one echinoid, Florida; from Henry W. Nichols, Chicago—2 mica condensers; from William E. Menzel, Chicago—a specimen of brown "mahogany" onyx marble, Mexico.

Department of Zoology:

From Charles H. Seevers, Chicago—12 flies, Colombia and Panama Canal Zone; from Dr. Harry Mock, Evanston, Ill.—a mountain lion skeleton, New Mexico; from Chicago Zoological Society, Brookfield, Ill.—7 birds and 9 mammals; from Henry S. Dybas, Chicago—733 insects and allies, United States and Colombia.

The Library:

Valuable books from Dr. Henry Field, Chicago; Rev. George Link, Grafton, Ill.; and Carnegie Institution, Washington, D.C.

Raymond Foundation:

From National Broadcasting Company, Chicago—45 recordings of Field Museum's "How Do You Know?" radio broadcasts.

JANUARY GUIDE-LECTURE TOURS

Conducted tours of exhibits, under the guidance of staff lecturers, are made every afternoon at 2 o'clock except Saturdays, Sundays, and certain holidays. Following is the schedule for January:

Wednesday, January 1—New Year holiday, *no tour;* Thursday—General Tour; Friday—Designs in Wood (Miss Marie B. Pabst).

Week beginning January 6: Monday—Minerals in Trades and Professions (Mr. Bert E. Grove); Tuesday—General Tour; Wednesday—The Races of Man (Mrs. Leota G. Thomas); Thursday—General Tour; Friday—Plants in Primitive Societies (Miss Marie B. Pabst).

Week beginning January 13: Monday—The Geology of Our National Parks (Mr. Bert E. Grove); Tuesday—General Tour; Wednesday—The World's Housing Problem (Miss Elizabeth McM. Hambleton); Thursday—General Tour; Friday—An Evolutionary Story of Animal Life (Mrs. Leota G. Thomas).

Week beginning January 20: Monday—The Shaping of the Earth's Surface (Mr. Bert E. Grove); Tuesday—General Tour: Wednesday—How the World Amuses Itself (Miss Elizabeth McM. Hambleton); Thursday—General Tour; Friday—The Geologic Record of Plants (Miss Marie B. Pabst).

Week beginning January 27: Monday—The Shaping of the Earth's Surface (Mr. Bert E. Grove); Tuesday—General Tour; Wednesday—Animals in Art (Miss Elizabeth McM. Hambleton); Thursday—General Tour; Friday—The Relationship of Animals to Environment (Mrs. Leota G. Thomas).

Persons wishing to participate should apply at North Entrance. Tours are free. By pre-arrangement with the Director, special tours are available to parties.

NEW MEMBERS

The following persons became Members of Field Museum during the period from November 16 to December 16:

Contributors

Mrs. Frederick S. Fish

Associate Members

Richard J. Finnegan, Dr. Earle Gray, Mrs. Jacob G. Joseph, Joseph B. Pierson, Edward S. Rogers, Louis Sisskind, Gardner H. Stern.

Annual Members

William N. Achenbach, George D. Allman, William R. Barker, Paul W. Brandel, L. Perkins Bull, H. W. Collins, Dr. Clinton A. Elliott, Mrs. John D. Farnham, James G. Fisher, A. H. Gairns, E. R. Geagan, Albert L. Gottschalk, Henry F. Hagemeyer, Dr. Helen Hersh, Mrs. W. B. Katzenberger, Dr. Elizabeth Thompson Koppenaal, Charles E. Larson, George C. Lazear, Joseph B. Mudd, Mrs. Helen C. Murphy, William M. Murray, J. Stanley Ness, Emery Robinson, David F. Rosenthal, Mrs. W. F. Schick, Mrs. Clifton M. Utley, John B. Whitelock, Miss Marie Witham.

Geologists Meet at Museum

The Mid-West Federation of Geological Societies recently met at Field Museum. Mr. Bryant Mather, Assistant Curator of Mineralogy, acted as host.

MEMBERSHIP IN FIELD MUSEUM

Field Museum has several classes of Members. Annual Members contribute $10 annually. Associate Members pay $100 and are exempt from dues. Sustaining Members contribute $25 annually for six consecutive years, after which they become Associate Members and are exempt from all further dues. Life Members give $500 and are exempt from dues. Non-Resident Life Members pay $100, and Non-Resident Associate Members $50; both of these classes are also exempt from dues. The Non-Resident memberships are available only to persons residing fifty miles or more from Chicago. Those who give or devise to the Museum $1,000 to $100,000 are designated as Contributors, and those who give or devise $100,000 or more become Benefactors. Other memberships are Honorary, Patron, Corresponding and Corporate, 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.

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 for federal income tax purposes.

Endowments may be made to the Museum with the provision that an annuity be paid to the patron for life. These annuities are guaranteed against fluctuation in amount, and may reduce federal income taxes.

PRINTED BY FIELD MUSEUM PRESS

Field Museum News

Published Monthly by Field Museum of Natural History, Chicago

Vol. 12 FEBRUARY, 1941 No. 2

HOUSING, FOOD, CLOTHING AND RELIGIOUS PRACTICES OF PREHISTORIC INDIANS

By PAUL S. MARTIN

CHIEF CURATOR, DEPARTMENT OF ANTHROPOLOGY

Life in North America about A.D. 1000, or nearly 500 years before the "discovery" of this continent, is graphically depicted in a new exhibit recently added to the Hall of Southwestern Archaeology (Hall 7) at Field Museum.

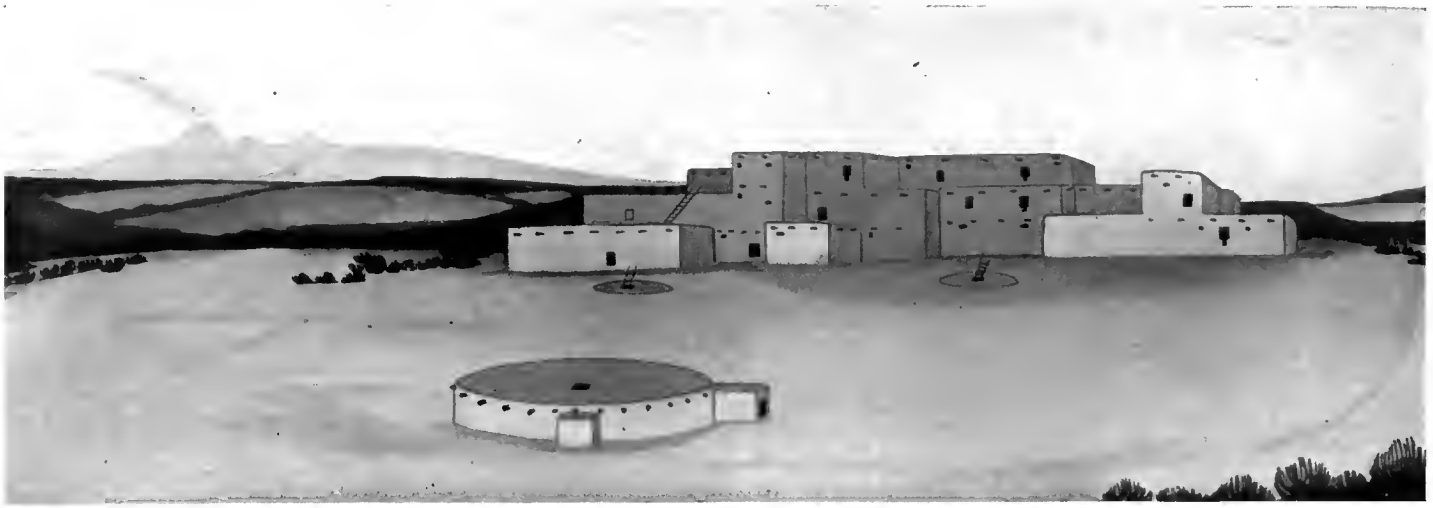
In its desire to make its collections tell their story in a more realistic and vivid manner, Field Museum devotes much effort to the creation of elaborate habitat groups of animals, and restorations of prehistoric Pueblo, Colorado, recently excavated by the Field Museum Archaeological Expedition to the Southwest. In this room, shown as being furnished simply and in accordance with materials found at the Lowry Ruin, a woman is seen kneeling on the floor and grinding corn with a grinding stone (*mano*) and a large stone hollowed out like a trough (*metate*). A man is shown stepping over the high threshold, bringing the dinner meat, a rabbit which he has just killed.

This ancient kitchen is a far cry from the present day housewife's labor-saving electrically equipped kitchen with shelves stocked with boxed cereals and canned goods, and a delivery boy bringing in a package of lamb chops. But at least there were no salesmen pestering the lady of the Pueblo house to buy expensive articles on the installment plan. She had the satisfaction of working with tools fashioned by herself or her husband, and life did not attain the modern dizzy pace. She no doubt tried to "keep up with the Joneses," but it was a simpler and less frantic procedure than today's. She and the others of her time made their own sandals, bows and arrows, and pottery, grew their own food, and hunted for game. Their pottery and tools were made to suit their own needs and to satisfy their own artistic sense. Feeding and clothing themselves and their children was not a matter of buying groceries and clothing from a store. The nearest they came to that was when they bartered products with their neighbors.

Arranged about this painting of a room interior are some of the familiar, homely, everyday objects which the Indians used in hunting game and growing and preparing other foods. These include digging blades used in planting seeds, a stone used for grinding corn, arrowheads used in hunting, a flaker used to make arrowheads, and a turkey-call whistle used in hunting game.

The "clothing panel" features a sketch of a Pueblo man and woman wearing twelfth century summer clothing. They remind one of the current fads for suntan and abbreviated sun suits. Yucca fiber and cotton were used to make their summer clothing, and in winter they used rabbit fur blankets. From colorful stones and turquoise they made pendants and beads without the aid of modern machinery. Hairdress is also illustrated —the men wore bangs, with the side hair cut short, and the back hair long. Unmarried women parted their hair in the middle, rolled it up at the sides, and fastened it with yucca cord.

Grouped about this sketch of a Pueblo man and woman are tools and implements which were used in weaving, sewing, and making clothes. Most of these tools are unfamiliar to us today. For example, there are fleshers used in removing the flesh from hides; awls and pins used to punch holes in the hides in order to fashion them into clothing; bodkins and long needles used to guide



"Apartment Building" in Southwestern Colorado, Eleventh Century A.D.

Lowry Pueblo as it is believed to have appeared when at the height of its occupancy by prehistoric Basket Maker Indians. The reconstruction is in the form of a painting, by Miss Anne Harding, based upon data obtained by Dr. Paul S. Martin, Chief Curator of Anthropology, under whose supervision a Field Museum expedition excavated the ancient site during a period of several years. The original painting, in colors, forms part of a new exhibit recently added to the Hall of Southwestern Archaeology (Hall 7).

animals and early man amid their natural surroundings. However, much important material is not susceptible to such treatment. Therefore, to avoid monotony in cases filled only with small objects, pictures form a welcome addition, especially if they show the relationship of the objects to their everyday or ceremonial use.

The effectiveness of such pictures is emphasized in the new exhibit representing early Pueblo Indian culture. One side of the case is devoted to carefully selected, related specimens, interspersed by colorful sketches graphically humanizing the story of the objects—sketches simple in tone, but realistic, and more exciting than photographs.

There are four vertical panels grouping objects connected respectively with food, clothing, housing, and religion. In the center of the "food panel" is a painting of a reconstruction of the interior of a room at Lowry

American Home Life, Eleventh Century A.D.

Interior of room or apartment at Lowry Pueblo in southwestern Colorado, as represented in a new exhibit now installed in the Hall of Southwestern Archaeology (Hall 7). The restoration, a painting by Miss Anne Harding, is based upon data furnished by Dr. Paul S. Martin, Chief Curator of Anthropology. Pictures of this type are used to make more vivid the story told by artifact exhibits.

the horizontal thread in weaving; a lap stone which also served as a pattern in weaving sandals, and some disc beads.

The "housing panel" centers about a colorful sketch of an accurate reconstruction and a diagram of Lowry Pueblo, Colorado, excavated by the writer's expeditions for Field Museum from 1930 to 1934. This pueblo has no windows and no glass brick, but its terracing could well be taken for the sundecks which present-day architects build into "modern" houses. Instead of stairways there were ladders. Their doorways, as is shown in the "food panel" sketch, did not reach fully to the floor but necessitated climbing over part of the wall. In place of windows they had small ventilators high up in the walls. The doorways in some of the upper sections appear to open out into space, but were reached by ladders. The pueblo construction was of stone, plastered with adobe. They had no problem of exterior paint, shutters, or angled roofing, to say nothing of screens and windows. One house served for the whole community and was not unlike what we call an apartment house. Fortunately for them—at least, so a weary cynic might say—the Pueblo Indians had no player-pianos, radios, or cornets. However, in this pueblo these Indians lived in contentment, loved, brought up their children, fed and clothed them adequately, and sheltered them from the elements. They entertained each other in various ways and really enjoyed life.

Surrounding the painting of Lowry Pueblo are tools and materials which were used in constructing this great pueblo: a portion of a roof log showing marks of the stone ax used in hewing it down and shaping it properly; stone axes with grooves provided for twisting pliable but strong branches about them for handles; other stones used as hammers and similarly grooved for handles, and some elk horn chisels.

The "religion panel" has as its focal point a sketch of a ceremony being performed in a *kiva*, the Indian equivalent of the Mayan temple or the present-day church. However, these kivas also served as fraternity chapter rooms. The younger men met there and swapped stories, or did weaving and other handwork. A few of them even slept there. Some kivas were built right into the Pueblo; some were separate structures. Fire, a universal element in religious ceremonies, is shown in a square fire-pit in the center of the kiva. Two men are seated on mats and smoking clay pipes (ceremonial pipes, not used for general smoking as pipes are used today). Beyond the fire are shown two prayer sticks standing in round stone bases. In the background are ceremonial masks—colorful and fantastic but not as grotesque as many Indian masks.

With the sketch of a *kiva* are shown ceremonial pottery, clay pipes, a lightning stone (i.e., a stone, shaped like an egg, which when rubbed with another like stone was said to produce lightning) and a prayer stick to which is attached a piece of corn husk and a feather. The latter two specimens indicate the importance which these Indians naturally attached to persuading the gods to give good weather for the crops.

The sketches are the work of Miss Anne Harding whose talents combine anthropological training with artistic skill. Her sketches entailed a great deal of study in order to have the details true to fact, and Miss Harding's effective use of color and contrast add much to their appeal.

A CHRONOLOGICAL CHART

The other side of the case is devoted to an exhibit less colorful but of considerable interest to archaeologists as well as to artisans. It is a chart, using actual specimens for illustrations, of various tools and ornaments used by the Pueblo Indians from earliest times up to the introduction of European metal work. On this chart one can see, by following horizontal panels, just what artifacts or tools were used at a certain time; or, by following the vertical panels, one can trace developmental changes that occurred from early to later times. Sometimes objects appear only at one time level. Sometimes decided changes in shape and skill are evident. Sometimes the same workmanship and design continue unchanged.

This latter exhibit is the result of painstaking research by Mr. John Rinaldo, Associate in Southwestern Archaeology, and presents a unique collection and arrangement of material not available in any other museum or anywhere else. It would be difficult to gather the same information from books or to visualize the objects from photographs. Here the actual artifacts are arranged in such a way that they can be seen in the original and compared easily because of their arrangement. Mr. Rinaldo has made here a very real contribution to our knowledge of Pueblo Indian tools and ornaments.

A Bit About Grapes

The Old World European grape (*Vitis vinifera*) is, as far as can be determined historically, a native of the Caspian region, although legendary history describes its birthplace in various other localities. It was cultivated in Egypt and is said to have been introduced into Europe by the Romans. Its early history has been preserved in the Homeric poems. In the *Iliad*, the shield of Achilles is described as figured with various scenes including a vineyard in which the vintage is being gathered. The wise god Bacchus, it is told, taught his worshipers to crown themselves with grape leaves when they drank deeply of wine, to prevent frenzy.

North America is rich in Vitis, and although *Vitis vinifera* produces the prevailing vineyard kinds in California, characteristic American vineyard grapes are the Labrusca, Aestivalis and Rotundifolia groups described in terms of their supposed original species. Other species have yielded varieties for cultivation, but most of them are of minor importance from a commercial standpoint.

EXPEDITION TO GALAPAGOS ON LEON MANDEL YACHT

Through the generosity of Mr. Leon Mandel, of Chicago, who for several years has been prominent on the list of Contributors to the Museum, a party of Field Museum zoologists is conducting an expedition in the Galapagos Islands, and will subsequently engage in collecting along the coast of Peru. The expedition sailed early in January from Havana aboard Mr. Mandel's yacht *Carola*, a 247-foot twin-screw Diesel-powered vessel. On board are Mr. and Mrs. Mandel, and the latter's mother, Señora Elvira Pañerai, of Havana.

The Museum party includes Dr. Wilfred H. Osgood, Curator Emeritus, Department of Zoology; Mr. Rudyerd Boulton, Curator of Birds; Mr. Loren P. Woods, Assistant Curator of Fishes; Staff Taxidermist Leon L. Walters; Mr. Melvin A. Traylor, Jr., volunteer worker in the Division of Birds, and Mr. Peter Lambert, of Zion, Illinois, an experienced amateur diver.

From Havana the yacht proceeded by the Panama Canal directly to the Galapagos Islands which lie some 600 miles off the coast of Ecuador. Collections will be made there of the colorful fishes which inhabit the adjacent waters, and of the few reptiles, mammals, and endemic birds to be found on various islands in the group. Life studies in still and motion pictures will be made, including under-water photography by means of a diving bell and other equipment devised and furnished by Mr. Lambert. Important among the endemic birds of the islands is a genus of finches called *Geospiza*, whose variations from island to island, and in different localities within the larger islands, as observed by Charles Darwin, supplied an important stimulus in the development of the theory of evolution, when, something over a hundred years ago, that famous scientist visited the Galapagos and noted the different species of this group of birds.

"RECEPTACLES FOR MEN'S SOULS"

The idea of the spirit or soul leaving the dying or dead body of a human being is very old and widespread, and characteristic of most religions, past and present, including Christianity. Conceptions of the occurrence of this event are usually expressed in the vaguest of terms, particularly by Christians. The manner of its taking place is seldom definitely visualized, although in a few paintings and other forms of expression attempts have been made to convey a picture of the departure of the soul as conceived by various authors.

Seeming tangibility is lent to the idea among the tribes of Malekula, in the New Hebrides islands of the South Pacific, by their production and use of "spirit receptacles." These are hollow wooden cones which the spirit of the deceased is supposed to enter at the time of death. Examples of them are on exhibition in Field Museum's comprehensive Melanesian collections in Joseph N. Field Hall (Hall A).

SPECIAL HOUSE FOR "TRAPPED SPIRITS"

When a man is dying among these people, one of these cones, very carefully wrapped so that no one can see it, is placed near or over the mouth of the expiring man. By this means it is believed that his spirit leaves his body and is received within the cone. When death has taken place, the cone containing the "captured spirit" is taken into a special house used only for the purpose. There it is placed on a platform with other similar cones. No uninitiated person is permitted to enter this house.

The spirits of the deceased are thus believed to remain present in this house, and the priesthood of the tribe is not above practising a little deception to bolster the faith of the followers, however sincere the leaders may be in the belief themselves; for on certain ceremonial occasions they cause the voices of the imprisoned spirits to come forth to gatherings of the believers. The "voices of the spirits" are produced by a shaman who talks through a bamboo tube into the cone, so that a peculiar muffled sound is produced. This subterfuge is, of course, carefully concealed from the ordinary tribesmen who must remain on the outside.

VOICE EQUIPMENT EXHIBITED

Included in Field Museum's exhibit is one of these "spirit talkers." It consists of a coconut cup which in use was half filled with water. The eerie sound representing the voice of the spirit was produced by talking through a short bamboo tube which conducted the sound into and through the water. This equipment, naturally, was kept closely hidden whether in use or not, and specimens are rare and difficult to obtain. Likewise, the cones, because they are held in veneration by the natives, and believed actually to contain the souls of men, are not easily obtained. The visiting anthropologist must resort to the utmost in persuasive arguments to induce the natives to part with them. He must convince them that the cones will be properly cared for, as well as that no harm will befall those who allow them to be taken.

SOUTH AMERICAN PRIMATES

By COLIN CAMPBELL SANBORN
CURATOR OF MAMMALS

The comical actions and wistful faces of monkeys always attract attention, and some of the South American monkeys, because of their prehensile tails, have an added special interest, as may be observed from a new exhibit in Hall 15 of Field Museum.

The prehensile tail is most highly developed in the purely arboreal spider monkeys and in the closely related woolly monkey. The latter lives exclusively on fruit, a diet that produces a very prominent abdomen.

The howler monkeys have a bony sound box which is a modification of the larynx. This gives them exceptionally loud voices that carry more than a mile when a troop is calling. They also have prehensile tails, as have the black and white and the brown capuchin monkeys. The brown capuchin is the monkey commonly seen with street organ grinders. These groups are the only monkeys in the world with prehensile tails.

Two very short-tailed types of monkeys are the sakis and ouakaris. The sakis live in the valleys of the Amazon basin, have black crinkly fur, and one has a white head. The ouakaris are almost bald, and the three known species live in very restricted areas in northern Brazil. Besides these there are the squirrel, titi, and night monkeys. The night monkeys live in holes in trees during the day. All these American forms have thirty-six teeth, whereas the Old World monkeys have only thirty-two.

Often confused with the true monkeys are the marmosets and tamarins. These have but thirty-two teeth and, with the exception of the big toe, have claws instead of flattened nails on the digits. The tail is often ringed and is not prehensile. There are many species of small size and with squirrel-like habits. They also show a great variety of colors, some being black and others white or golden, and many have a combination of colors. Like many of the primates they make interesting and attractive pets.

Woolly Spider Monkey

Striking example of the prehensile-tailed monkeys of South America, included in a new exhibit recently added to the systematic collection of mammals in Hall 15.

All these may be seen on two screens in the recently installed exhibit. Seven new specimens, prepared by Staff Taxidermist W. E. Eigsti, were added to those formerly on exhibition. All but one of the genera of South American primates are now represented on these screens.

BONES OF RARE FOSSIL SLOTH, FIRST NAMED BY THOMAS JEFFERSON, FOUND IN ILLINOIS

By BRYAN PATTERSON
ASSISTANT CURATOR OF PALEONTOLOGY

In addition to being the third President of his country and a statesman whose stature has increased over the years, Thomas Jefferson was one of the foremost naturalists of his time. Actively concerned with promoting the sciences in the infant nation, he served for many years as president of the American Philosophical Society, a position comparable in the scientific world of the day to that of chief executive in the political. Jefferson was particularly interested in the bones of the large extinct mammals which were, and still are, to be found in the bog and cave deposits of the eastern part of the country, his activities in this field justly entitling him to be regarded as America's first paleontologist. His collection of these remains was an extensive one for those days, and was for a time deposited in a room of the White House.

In 1796 Jefferson received some large fossil bones, including an enormous claw, from a cave in what is now West Virginia. To these he gave the name of *Megalonyx*, meaning "Great Claw," supposing that he was dealing with "... an animal of the lion kind." It was his expressed belief that the beast might still be living in "... the immense country to the west and northwest." These conclusions were eminently reasonable, considering the state of knowledge of paleontology and geography at the time, but they were speedily disproved by the progress of research and exploration. Within a few years it was known that *Megalonyx* was a relative of the sloths, and the explorers of the west found no trace of it in their wanderings. Since 1796 additional fossil remains of *Megalonyx* have been found in various parts of the country, sufficient to give an adequate idea of the general form of the animal, although no complete skeleton has ever been found.

MOST COMPLETE ILLINOIS SPECIMEN

Finds of such animals in Illinois have been very few—some teeth near Alton, part of a vertebra near Charleston, a claw at Urbana, and a bone of the hand in the Galena region. Considerable interest was therefore aroused in the Museum when Mr. Forrest L. Boden, of London Mills, Illinois, sent in a letter, accompanied by drawings, describing some fossil bones which he had found near that town. It was immediately recognized from the drawings that the animal was a ground sloth, probably *Megalonyx*. The owner of the land on which the specimen was located, Professor Arnim D. Hummell, very kindly extended permission to excavate. Chief Preparator James H. Quinn and the writer therefore visited the locality in December. The bones occurred in a deposit of blue clay, underlain by gravel, exposed in the side of a gully developed in a pasture. The greater part of, if not the entire, skeleton had once been present, but unfortunately by the time the find was made most of it had eroded away. Excavation revealed a few bones, but these, together with the ones recovered by Mr. Boden, were far from sufficient to permit the mounting of a skeleton. Nevertheless the specimen, consisting of a good part of a hind leg, portions of the pelvis, bones of the forefoot, various elements of the vertebral column, and a molar tooth, is by far the most complete ever found in the state, and adds a few details to our knowledge of the anatomy of the animal. The Museum has on exhibition skeletons of various ground sloths from other countries, but none of this kind.

South American Ground Sloths

Skeletons of *Scelidodon*, collected in Bolivia by the Marshall Field Paleontological Expedition (1927), as now exhibited in Ernest R. Graham Hall. The Illinois *Megalonyx*, subject of the accompanying article by Assistant Curator Bryan Patterson, was very similar to these animals in general appearance, but had a shorter, deeper head. Thomas Jefferson, who was eminent as a acientiat as well as President of the United States, gave *Megalonyx* its name.

The blue clay in which the fossil was buried, as well as the gravel underlying it, appears to be an outwash deposit from the terminal moraines left by the glaciers of the Illinois glacial advance. This was the third of the four major glacial advances that covered a large part of North America during the Pleistocene or Glacial epoch, the time in geologic history preceding the Recent. Our sloth evidently lived, therefore, in the early part of the so-called Sangamon interglacial stage, the age of which may roughly be reckoned at about 200,000 years.

Megalonyx was about eleven feet long and some four feet high. In general appearance it was similar to other ground sloths, of which skeletons and restoration paintings are exhibited in Ernest R. Graham Hall. The head was small in proportion to the large and heavy body. The limbs terminated in exceedingly strong, clawed feet, so constructed that the animal walked on the knuckles of the forefoot and on the side of the hind foot. The tail was long and massive, serving as the third support of a tripod on which the animal could stand erect. Strictly vegetarian, *Megalonyx* and the other ground sloths used their claws primarily for digging up roots and tubers or for pulling down leafy branches, and only secondarily as defensive weapons.

CONTEMPORARY WITH EARLY MAN

The ground sloths were a rather successful group, their known history extending over a period of some twenty million years. Their actual history went back still further, but we have no record of their beginnings. Natives of South America, they made their way northward into what is now the United States in the Pliocene and Pleistocene epochs. The elevation of the Isthmus of Panama, which took place in the Pliocene, brought them into contact with new enemies but, although clumsy and slow moving, they were able to hold their own. Their size and thick hides assured their safety against all but the largest carnivores, and against these the adults at least were undoubtedly able to defend themselves successfully. When their great strength and sharp claws are taken into consideration, it becomes evident that an embrace from a sloth would have made a bear's hug look like child's play. They would have been quite helpless, however, against men armed with weapons and, since there is good evidence that they were contemporaneous with the early inhabitants of both North and South America, it is quite possible that man was a contributory if not a major factor in their extinction. The fact that sloth remains have been found with remains of the skin still adhering to the bones suggests that they survived until comparatively recent times. When Jefferson suspected that *Megalonyx* might still be living in the interior of the continent he may not have been wrong by more than a few thousand years.

LONG LOST TRAVEL RECORD PUBLISHED BY MUSEUM

To the many travel books about South America, a unique addition was contributed recently by Field Museum Press with the publication of *Travels of Ruiz, Pavón and Dombey in Peru and Chile.* This is the first appearance in English of the long lost narrative of a famous botanical expedition made to western South America in 1777–88. The author, Don Hipólito Ruiz, and his companions, were commissioned by King Charles III of Spain to explore his South American dominions and collect their flora. They spent ten years traveling among the mountains and valleys of western South America. Then for many years thereafter, in fact until their deaths, they were occupied with preparing their reports.

At a time when the then British colonies in North America were in the midst of the revolution which produced the republic of the United States, the scientific activities of the Spaniards in their American domains were at their height. Expeditions were dispatched to Venezuela, Mexico, the west coast of North America, Colombia, Peru, and Chile to obtain collections, write descriptions, make pictures in the field, and send seeds and living plants to botanical gardens at home.

Because of good management and successful scientific results, the most notable of these expeditions was that to Peru, in charge of Ruiz. With José Pavón as second botanist, Isidro Galvez and José Brunete, artists, and José Dombey, a French botanist permitted at the request of the King of France to accompany the Spaniards, Ruiz sailed from Cadiz in October, 1777, for Callao, Peru.

MANUSCRIPT LOST UNTIL 1930

The narrative of their travels, written by Ruiz after his return to Spain in 1788, was not published at the time. Forgotten and unknown for almost a century and a half, it was finally discovered in private hands, and recovered. It was printed only as recently as 1930, even in Spain, by a commission of the Academy of Sciences in Madrid.

Field Museum, which has been active in the recent botanical exploration of Peru, is publishing a flora of that country, much more comprehensive though less elaborate than that of Ruiz and Pavón. Permission was obtained from the Spanish Academy to publish an English version of the narrative of Ruiz. The translation is by Dr. B. E. Dahlgren, Chief Curator of the Department of Botany.

BANDITS AND OTHER PERILS

While much of the text is concerned with the description of botanical specimens collected by the explorers, it is also a notable tale of adventure, in which Ruiz describes sufferings and misfortunes, travels over dangerous and horrible trails, encounters with bandits, and other perils to the lives of the collectors, and loss of collections from shipwreck and fire. The interest is heightened, rather than diminished, by the matter-of-fact, unadorned style of its narration, which has been preserved in translation. In it, a traveler exposed to hardship, danger, and high adventure, tells his story with the solemnity and unimaginativeness of a factory production manager's daily reports.

THINGS YOU MAY HAVE MISSED

The Rosetta Stone

It is a curious fact that in many cases modern archaeologists can do a better job of reading ancient Egyptian records on rocks, tablets, and papyri, than could the ancient Egyptians themselves. That is, Egyptians of one period—for example, 500 B.C.—could not read the hieroglyphics of their ancestors of 2500 B.C. because writing had changed so much, just as the changes which occurred in the transition from mediaeval to modern English have made the old language unintelligible to most of our contemporaries.

Ancient Proclamation

Facsimile of the famous Rosetta Stone, included among exhibits in Field Museum's Hall of Egypt (Hall J).

Archaeologists themselves learned to decipher ancient Egyptian writings only about one hundred years ago. They learned from study of bilingual stelae which, in effect, were comparable to a two-language dictionary, since they contained inscriptions in both the Egyptian and Greek languages.

A stele is a rock with an inscription, resembling a tombstone. Such rocks, rather than papyri, were generally used for recording important royal events. The most famous of all stelae is the Rosetta Stone, the original of which belongs to the British Museum. A facsimile of this stone is on exhibition in Field Museum's Hall of Egypt (Hall J).

The original was found at Rosetta, near the western mouth of the Nile, by a Frenchman named Bouchard who was engaged in work to strengthen Fort St. Julien during Napoleon's unsuccessful expedition to conquer Egypt in 1798. Placed in the custody of a General Menou, it was later seized by the victorious British, and thus found its way into the British Museum. About 1815 the method of deciphering it was found almost simultaneously by two scholars—a great English physicist, Thomas Young, and a Frenchman, Jean Francois Champollion. From its threefold rendering of one and the same document—in two Egyptian scripts, hieroglyphic and demotic, and also in Greek—Young deduced the values of several hieroglyphic letters. Champollion, comparing it with other texts, achieved the fundamental understanding of ancient Egyptian writing on which our modern knowledge is built.

PURPOSE OF THE STONE

The story of the Rosetta stone itself, and its purpose to its authors, is as follows:

Ptolemy V (Epiphanes), who ruled Egypt after its conquest by Alexander, had shown special favors to the priesthood. In return the priests held a convention at Memphis in his ninth year (he reigned 205–182 B.C.) and passed a resolution to set up a statue of the king in every sanctuary alongside that of the local god, to celebrate monthly the king's birthday and his accession to the throne, to hold an annual five-day festival in his honor, and to add to their titles that of "priests of Epiphanes." They resolved also that their action should be recorded on hard stone tablets in triplicate—in the ancient Egyptian hieroglyphic writing, in the cursive Egyptian demotic writing then current, and in Greek, and that such a tablet should be set up in every first, second, and third class temple throughout the land. No other copy of this resolution has been found, but fragments of a few other stelae containing similar documents are known.

The Albatross

Have you ever seen an albatross? This bird, which constantly recurs in a ghostly role throughout "The Rime of the Ancient Mariner," forms a conspicuous feature of a group of sea-birds on exhibition in Hall 20. The birds are shown in a reproduction of their nesting grounds on Laysan Island in the mid-Pacific.

An interesting study in plant geography is furnished by the exhibit of spices and nuts in Hall 25 of the Department of Botany.

A specimen of lapis lazuli, believed to be the largest in existence, is on exhibition in the mineral collection in Hall 34.

Field Museum of Natural History
FOUNDED BY MARSHALL FIELD, 1893
Roosevelt Road and Field Drive, Chicago
TELEPHONE: WABASH 9410

BOARDMAN CONOVER A TRUSTEE; ALL OFFICERS RE-ELECTED

Mr. Boardman Conover, of Chicago, who for many years has evinced the greatest interest in Field Museum's progress, and has been intimately associated with its work, was recently elected a Trustee of this institution, to fill a vacancy on the Board which had existed for a year. Mr. Conover has long been deeply interested in birds, and is highly qualified as an ornithologist. He has been a Research Associate in Ornithology, serving on the Museum's staff without compensation, since 1924. He has been assigned a laboratory in the Division of Birds, and spends a great deal of his time in active research work and in building up the collections in his special field of game birds, to which he has made many valuable contributions. In 1920 Mr. Conover accompanied Dr. Wilfred H. Osgood, former Chief Curator of the Department of Zoology, on an expedition to Venezuela which obtained a large collection of birds and mammals. In 1922 he participated in another expedition, to Chile, with Dr. Osgood and Mr. Colin C. Sanborn, Curator of Mammals. Shortly after his return from Chile, he undertook by himself an expedition to Alaska which was notably successful in the resulting large collection of birds secured. Mr. Conover's most important expedition was in 1926–27 when, together with Mr. R. H. Everard, of Detroit, he financed and led the Conover-Everard Central African Expedition of Field Museum. Accompanied by former Assistant Curator John T. Zimmer, Messrs. Conover and Everard spent many months in the field, and their hunting yielded especially important results, including a specimen of the extremely rare so-called white rhinoceros, as well as extensive collections of other mammals, birds, and reptiles. The white rhinoceros is now on exhibition in Carl E. Akeley Memorial Hall (Hall 22). In recent years Mr. Conover has traveled to many other places, and has made many other important collections for the Museum. He has further contributed funds toward expeditions made by other members of the Museum staff, and for the purchase of special desiderata. In recognition of his many services and contributions, the Trustees had previously honored Mr. Conover by electing him at various times as a Patron of the Museum, a Contributor, a Corporate Member, and a Life Member.

Boardman Conover

At the annual meeting of the Board of Trustees, held January 20, all Museum officers who served in 1940 were re-elected for the ensuing year. Mr. Stanley Field thus now begins his thirty-third consecutive year as President. The other re-elected officers are: Colonel Albert A. Sprague, First Vice-President; Mr. Silas H. Strawn, Second Vice-President; Mr. Albert W. Harris, Third Vice-President; Major Clifford C. Gregg, Director and Secretary, and Mr. Solomon A. Smith, Treasurer and Assistant Secretary.

Name of New Plant Genus Honors Museum Trustee

Among the thousands of Guatemalan plants added to the Herbarium of Field Museum by the 1939 Sewell Avery Botanical Expedition to Guatemala was one which has been found to represent a genus new to science. The plant is a small herb with cream-colored flowers and belongs to the Acanthus family. It was collected in the Department of Retalhuleu by Mr. Paul C. Standley, Curator of the Herbarium. The plant has now been named *Averia serrata* by Mr. Emery C. Leonard, of the Division of Plants, United States National Museum. Mr. Leonard recently described and figured the plant in the *Journal of the Washington Academy of Sciences* for December, 1940, placing it in a new genus, *Averia*, named in honor of Mr. Sewell Avery, Museum Trustee, who sponsored the Expedition. —J.A.S.

Important Peruvian Plant Collection

A collection of 2,300 specimens of plants of Peru and Bolivia has been received for determination by the Department of Botany of Field Museum. They were obtained by the University of California's recent Second Botanical Garden Expedition to the Andes, through its Director, Dr. T. H. Goodspeed.

The study and naming of so large an amount of material obviously will require much time and effort, but good progress already has been made, and several hundred of the plants have been determined. The fine specimens of Peruvian plants are a particularly welcome acquisition, of immediate practical use in preparation of the Museum's *Flora of Peru*, of which seven parts already have been published.—P.C.S.

Guide-Lecturer Appointed

Miss Elizabeth Best has been appointed as a guide-lecturer on the staff of the James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures, and will begin her duties on February 1. Miss Best was graduated from Mount Holyoke College with a bachelor of science degree, and later took a master of science degree at the University of Chicago. For some time past she has been a volunteer assistant in Field Museum's Department of Zoology, where she has been engaged in important research, with particular reference to the origin and relationships of the giant panda, in co-operation with the work of the Division of Anatomy.

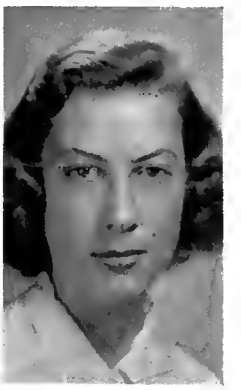


Photo by Lord's, Evanston

Miss Elizabeth Best

A FEW FACTS ABOUT FIELD MUSEUM

Field Museum is open every day of the year (except Christmas and New Year's Day) during the hours indicated below:

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

Free courses of lectures for adults are presented in the James Simpson Theatre on Saturday afternoons (at 2:30 o'clock) in March, April, October, and November.

A Cafeteria serves visitors. Rooms are available also for those bringing their lunches.

Chicago Motor Coach Company No. 26 busses provide direct transportation to the Museum. Service is offered also by Surface Lines, Rapid Transit Lines (the "L"), interurban electric lines, and Illinois Central trains. There is ample free parking space for automobiles at the Museum.

MARCH 1 MARKS OPENING OF SATURDAY LECTURES

Beginning March 1, Field Museum will present its seventy-fifth free course of illustrated lectures on science and travel for adults. Lectures will be given each Saturday afternoon, at 2:30 o'clock, during March and April, in the James Simpson Theatre of the Museum. Well-known scientists, explorers, and naturalists have been engaged for the series, and all lectures will be illustrated with motion pictures or stereopticon slides, in many cases in natural colors.

The opening lecture on March 1 will be "Headhunters Still Live," and the speaker will be Mr. Douglas Oliver, well-known anthropologist on the staff of Harvard's Peabody Museum. In his lecture he will relate his experiences among the extremely primitive natives of forbidding Bougainville Island in the far Pacific—people in a Stone Age state of development.

The March issue of FIELD MUSEUM NEWS will contain a complete schedule of all nine lectures in the course.

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. Requests for these seats should be made in advance by telephone (WABash 9410) or in writing, and seats will be held in the Member's name until 2:30 o'clock on the day of the lecture. All reserved seats not claimed by 2:30 P.M. will be made available to the general public.

SUMMARY OF 1940 ACTIVITIES AT FIELD MUSEUM

The opening of the large and important Hall of Babylonian Archaeology (Hall K) constituted a major accomplishment of Field Museum during 1940. The material on display includes the most interesting of thousands of objects excavated from ancient Kish during ten years' operations of the Field Museum-Oxford University Joint Expedition to Mesopotamia, and represents the cultures of Babylonia from the fourth millenium B.C. to the fourth century A.D.

Many other new exhibits were installed in all departments during the year. Among these are habitat groups of kiwi, red grouse, and fur seals, a diorama illustrating the spring flora of the Chicago area, a series of large mural paintings by Mr. Julius Moessel telling the story of the world's food plants, and a new type of analytical-biological exhibit graphically answering the question "What is a bird?" All of these, and others, have been described in detail in FIELD MUSEUM NEWS.

At the Museum's time of closing on December 31, the number of visitors for 1940 totaled 1,450,685, exceeding the 1939 attendance by more than 40,000. Only 80,888 visitors paid admission, the overwhelming majority either coming on free days or belonging to classifications such as children who are admitted free on all days. Many additional hundreds of thousands were reached by such extra-mural activities as those conducted for school children by the N. W. Harris Public School Extension, and the James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures; and many others by lectures for adults, guide-lecture tours, the "Layman Lectures" by Mr. Paul G. Dallwig, a series of radio broadcasts, a series of television programs, publications, newspaper and magazine articles, etc.

Field work was conducted by a number of Museum expeditions, of which accounts have appeared in the NEWS.

The membership rolls on December 31 included 4,225 names, a small increase over the number of persons supporting the Museum in this manner as compared with the previous year.

The output of Museum publications was continued on a large scale by Field Museum Press. Twenty-five technical publications were issued and distributed internationally among scientific institutions and individual scientists. In addition, two new popular leaflets, new editions of guidebooks and handbooks, and a vast amount of miscellaneous matter were produced.

Notable additions were made to the Museum Library's collection of scientific books and pamphlets, now numbering approximately 120,000 volumes.

The Work Projects Administration of the federal government continued its project in the Museum, giving employment to an average of 165 men and women. The highest number of these workers at any one time was 200, and the aggregate man-hours worked by the entire force was approximately 257,400.

Staff Notes

Mr. Bryant Mather, Assistant Curator of Mineralogy, has been elected Vice-Chairman of the Marquette Geologists Association. He has also been appointed Technical Counselor to the Chicago Chapter of the American Gem Society, before which he lectured recently on "Gems and Crystalline Matter."

Dr. Julian A. Steyermark, Assistant Curator of the Herbarium, was recently appointed to the Board of Directors of the Midwest Horticultural Society. He lectured last month before the Chicago Aquarium Society on "Exploration in Guatemala."

Mr. Rupert L. Wenzel, Assistant Curator of Insects, is in the east where he will spend about a month conducting research on parasitic bat flies and histerid beetles, particularly type specimens, in the collections of principal museums in New York, Philadelphia, Washington, Pittsburgh, and Boston.

600 MILLION YEARS OF LIFE IN SUNDAY LECTURES

During February the Sunday afternoon lectures presented by Mr. Paul G. Dallwig, the Layman Lecturer, will be on "Nature's 'March of Time.'" In this lecture Mr. Dallwig will carry his audience through the principal stages of animal life from the earliest fishes, reptiles and mammals to the first man—a span of about 600,000,000 years. To illustrate his subject, Mr. Dallwig will use the extensive exhibits of prehistoric animals in Ernest R. Graham Hall. Mr. Dallwig vividly dramatizes all of his subjects, and a special feature of this lecture will be his enactment of a fight, typical of the ceaseless struggle for existence, between the huge flesh-eating Tyrannosaurus and the plant-eating horned Triceratops, two of the largest known dinosaurs.

Copyright Field Museum

Restoration of Stegosaur

(Painting by Charles R. Knight, in Graham Hall.)

To meet the demands for accommodations, the same lecture will be presented on each of the four Sundays of the month (February 2, 9, 16, and 23). Lecture audiences assemble promptly at 2 P.M. Because the number that can be conducted among the exhibits under comfortable circumstances on a lecture of this type is limited, it is necessary to make reservations for all Sunday lectures well in advance. This may be done by mail or telephone (WABash 9410). Children cannot be accommodated. The lectures last until 4:30 P.M., but midway there is a half-hour intermission. During this interval those who desire to smoke or obtain refreshments may do so in the Cafeteria, where special tables are reserved for the group.

Plant and Insect Life of the Dunes

The Indiana Dunes rank among the most popular of playgrounds for Chicagoans. The insect life of the Dunes region may be studied in a habitat group in Albert W. Harris Hall (Hall 18). The *Flora of the Dunes*, an illustrated handbook by Donald Culross Peattie, published by Field Museum Press, treats exhaustively of the plant life.

Habitat groups of South American mammals in Hall 16 include the tapir, guanaco, marsh deer, anteater, jaguar, and capybara.

MOTION PICTURES FOR CHILDREN TO BEGIN THIS MONTH

The James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures will present two special motion picture programs for children during February, and will open its regular spring series of programs on Saturday morning, March 1.

The first special program will be given on Wednesday, February 12, and will be devoted to the dual purpose of presenting films commemorating Abraham Lincoln's birthday and marking the activities connected with National Boy Scout Week which occurs at that time.

The second special program will be given on Saturday, February 22, and will feature films on the life of George Washington, and also on "The Conservation of Our Country," the latter being concerned with present-day needs which are rapidly becoming more acute in many regions.

The first of the regular spring series of programs, on Saturday, March 1, carries the title "Cloudy and Colder, Probably Snow." This program will be devoted to films presenting the story of weather, and will cover such subjects as the mysteries of snow, dew fall, clouds, and flood weather. There will also be an animated cartoon, "Fun On Ice." A full schedule of the programs to be presented each Saturday morning during March and April will appear in the next issue of FIELD MUSEUM NEWS, due March 1.

All programs, those on the holidays, and those in the regular Saturday series, will be given in the James Simpson Theatre of the Museum, with two showings of each, one at 10 A.M., and one at 11. Children from all parts of Chicago and suburbs are invited. The Museum is prepared to receive large groups from schools, and other centers, as well as individual children coming either alone or accompanied by parents or other adults. Teachers are urged to notify their classes about these programs. No tickets are needed for admission.

GIFTS TO THE MUSEUM

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

Department of Anthropology:

From Henry J. Bruman, State College, Pa.—51 ethnological specimens representing the Huichol Indians, Mexico.

Department of Botany:

From Donald Richards, Chicago—51 specimens of miscellaneous cryptogams, Minnesota, Indiana, and Illinois; from Dr. G. W. Prescott, Albion, Mich.—44 specimens of algae, Wisconsin; from W. A. Daily, Cincinnati, Ohio—68 specimens of Chroococaceae, Ohio and Kentucky; from Illinois State Museum, Springfield, Ill.—84 herbarium specimens, Illinois; from Dr. Julian A. Steyermark, Chicago—2,520 herbarium specimens, Missouri; from Bill Bauer, Webster Groves, Mo.—90 herbarium specimens, Illinois.

Department of Geology:

From O. A. Gentz, Chicago—a very fine specimen of thomsonite, Minnesota; from Arnim D. Hummel, Richmond, Ky.—partial skeleton of *Megalonyx* in the ground, Illinois; from Mrs. Abe Friedman, Rapid City, S. D.—2 specimens of calcite crystals, South Dakota.

Department of Zoology:

From Dr. Thomas Poulter, Chicago—a penguin, Antarctica; from Lincoln Park Zoo, Chicago—a snake; from E. Fred Bromund, Mt. Pleasant, Mich.—108 lots of shells; from E. Wyllys Andrews, Cambridge, Mass.—966 snakes, lizards, frogs, salamanders, and turtles, Mexico; from Chicago Zoological Society, Brookfield, Ill.—an alligator, 3 mammals, and 23 birds.

The Library:

Valuable books from Mrs. Stanley Field, Lake Forest, Ill.; Carnegie Institution, Washington, D. C.; and Dr. Henry Field, Miss Marie Pabst, Dr. Wilfred H. Osgood, and William J. Gerhard, all of Chicago.

FEBRUARY GUIDE-LECTURE TOURS

Conducted tours of exhibits, under the guidance of staff lecturers, are made every afternoon at 2 o'clock except Saturdays, Sundays, and certain holidays. Following is the schedule for February.

Week beginning February 3: Monday—Fur-Bearing Animals (Mrs. Leota G. Thomas); Tuesday—General Tour; Wednesday—Burying the Dead (Miss Elizabeth McM. Hambleton); Thursday—General Tour; Friday—Naturalized Plant Citizens (Miss Marie B. Pabst).

Week beginning February 10: Monday—How Rocks and Minerals Are Identified (Mr. Bert E. Grove); Tuesday—General Tour; Wednesday—(*Lincoln's Birthday*) Plants and Animals of Illinois (*including those with which Abraham Lincoln must have been familiar*) (Miss Marie B. Pabst); Thursday—General Tour; Friday—The Earth's Green Mantle (Miss Marie B. Pabst).

Week beginning February 17: Monday—Conservation and the Geologist (Mr. Bert E. Grove); Tuesday—General Tour; Wednesday—From Invertebrates to Primates (Mrs. Leota G. Thomas); Thursday—General Tour; Friday—Reading, Writing and 'Rithmetic (Miss Elizabeth McM. Hambleton).

Week beginning February 24: Monday—Animals of the Past and Present (Mr. Bert E. Grove); Tuesday—General Tour; Wednesday—Primitive Beauty Shops (Miss Elizabeth McM. Hambleton); Thursday—General Tour; Friday—The Mystery of the Animals (Mr. Clarence L. Brown).

Persons wishing to participate should apply at North Entrance. Tours are free. By pre-arrangement with the Director, special tours are available to parties.

NEW MEMBERS

The following persons became Members of Field Museum during the period from December 17 to January 15:

Associate Members

John C. Bagby, Mrs. Charles C. Haffner, Jr., Allin K. Ingalls, Edward H. Ravenscroft, John M. Simpson.

Annual Members

John D. Black, Thomas M. Borrowdale, Mrs. Raymond I. Caspers, Robert A. Cavenaugh, Mrs. Leonard B. Ettelson, Francis A. Flaks, Seward C. Frazee, William H. Haynes, E. C. Herthel, Dr. Walter H. O. Hoffmann, Mrs. W. Robert Johnston, A. J. Joyce, Charles F. Krametbauer, Michael J. Layden, Josias Leao, Charles A. Leatzow, John M. Lee, Mrs. William George Lee, Charles E. Lewis, Mrs. Lloyd Lewis, Philip Lee Musick, Miss Minnie L. Patterson, Daniel Peterkin, Jr., Joseph Richard Pick, George A. Schmidt, D. D. Thirkield. Frederick W. Vodoz, Mrs. Allen B. Wrisley.

A complete set of masks used by the Navaho Indians in their Night Chant Ceremony is exhibited in Hall 6.

Birds of foreign lands which have been introduced into America by man are exhibited in a special case in Hall 21.

MEMBERSHIP IN FIELD MUSEUM

Field Museum has several classes of Members. Annual Members contrioute $10 annually. Associate Members pay $100 and are exempt from dues. Sustaining Members contribute $25 annually for six consecutive years, after which they become Associate Members and are exempt from all further dues. Life Members give $500 and are exempt from dues. Non-Resident Life Members pay $100, and Non-Resident Associate Members $50; both of these classes are also exempt from dues. The Non-Resident memberships are available only to persons residing fifty miles or more from Chicago. Those who give or devise to the Museum $1,000 to $100,000 are designated as Contributors, and those who give or devise $100,000 or more become Benefactors. Other memberships are Honorary, Patron, Corresponding and Corporate, 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.

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 for federal income tax purposes.

Endowments may be made to the Museum with the provision that an annuity be paid to the patron for life. These annuities are guaranteed against fluctuation in amount, and may reduce federal income taxes.

PRINTED BY FIELD MUSEUM PRESS

Field Museum News

Published Monthly by Field Museum of Natural History, Chicago

Vol. 12 MARCH, 1941 No. 3

MUSEUM RESTORES GIANT FOSSIL BIRD THAT TERRORIZED LARGE MAMMALS

By BRYAN PATTERSON
ASSISTANT CURATOR OF PALEONTOLOGY

After some years of work in Field Museum's paleontological laboratories a skeletal restoration of *Mesembriornis*, one of the most spectacular of all birds either living or extinct, has recently been mounted and placed on exhibition in Ernest R. Graham Hall (Hall 38). This mount, the first of its kind ever to be exhibited in any museum, is based on two specimens collected in the Pliocene deposits of the Province of Catamarca, Argentina, by the Second Marshall Field Paleontological Expedition to Argentina and Bolivia under the leadership of Mr. Elmer S. Riggs, Curator of Paleontology.

Mesembriornis was a carnivorous, terrestrial bird, standing almost five feet in height, unable to fly but capable of running at great speed. The large head, the enormous hooked beak, and the powerful feet and claws testify eloquently to its carnivorous habits. The greatly reduced wings were obviously useless for flight, but were doubtless used for balancing purposes while the bird was running. The trim, narrow body, straight pelvis, and long, powerful legs are the marks of a swift runner. This bird may have been as fast as the ostrich, which is credited with the ability to outdistance a galloping horse in a straight run. A bird of such size, ferocity and speed was certainly a most formidable engine of destruction.

Giant Carnivorous Bird of a Past Age

Mesembriornis as it is believed to have appeared in life. Drawing by John Conrad Hansen, based on a skeletal restoration recently added to Ernest R. Graham Hall. One of the most spectacular of all birds, either living or extinct, it stood some five feet in height. During about 20,000,000 years of the Age of Mammals, birds of this type were often the victors in battles with large four-legged creatures whose remains they then devoured. There was terrific striking power in their great feet, and they could tear flesh viciously with their sharp claws and long beaks.

The extinct group to which *Mesembriornis* belonged, the Phororhacoidea, was exclusively South American in distribution. It was composed of three closely related families, the Phororhacidae, of which *Mesembriornis* is a typical representative, the Psilopteridae, and the Brontornithidae. The psilopterids resembled the phororhacids rather closely in proportions and general skeletal structure, but were relatively small, not exceeding three feet in height. The brontornithids, on the other hand, were gigantic birds which must have attained heights of eight feet or more. More heavily built and with relatively shorter lower leg bones than the members of the other two families, they were undoubtedly less speedy. Members of all three families are found in deposits ranging from Oligocene to Pliocene age, i.e., from about 22,000,000 to 2,000,000 years ago. The earliest forms are practically as specialized as the latest, a fact which indicates a long pre-Oligocene history which is at present entirely unknown.

So large and varied a group of flesh-eating birds certainly preyed on a wide variety of animals from creatures of mouse size to the larger herbivorous mammals. That ground-living birds should have played so important a role in the economy of nature is most unusual. A comparable situation does not exist anywhere in the world today, nor is it known to have existed in the past except in South America. The reason for its occurrence there is of extraordinary interest. Toward the end of the Age of Reptiles, South America became isolated from the rest of the world and remained so until near the end of the Age of Mammals. As a result of this isolation, a fauna almost as peculiar as that of Australia developed. This fauna included no true carnivorous mammals. The place of these predators was partially taken by flesh-eating relatives of the opossum which evolved to fill this essential niche in the ecologic structure. Some of these forms became extraordinarily similar to totally unrelated true carnivores living elsewhere. By far the most striking of them was the marsupial saber-tooth *Thylacosmilus* which was amazingly like the saber-toothed cats of North America and the Old World. Despite skin-deep similarities in appearance, however, these animals were no more efficient than inadequate substitutes usually are. They failed to become the dominant predators of the region, and as a result the evolution of the phororhacoids became possible. The extinction of these birds, shortly after coming into contact with the cats, dogs, and other Carnivora which entered South America after the reunion of that continent with North America in the Pliocene epoch, significantly suggests that they could never have arisen had they been faced with effective competition from the start.

MODERN RELATIVES ARE NOTABLE BIRDS

In view of the decidedly carnivorous habits of the phororhacoids, it is rather surprising to find that they were related to neither of the two great orders of preda-

Extinct Bird Dwarfs Modern Eagle

Skeletal restoration of the flightless *Mesembriornis*, now exhibited in Graham Hall, compared with the skeleton of a golden eagle, one of the larger modern flying birds of prey. The ancient giant from South America, like the present-day ostrich, used its proportionately small wings only for purposes of balancing while running. Indications are that this formidable engine of destruction may have been able to attain the speed of a galloping horse.

tory birds, the hawks and eagles, and the owls. For some time after their discovery there was considerable controversy among paleontologists and ornithologists over their true position in the bird class, a dispute that was settled in 1899 by the late Dr. C. W. Andrews of the British Museum. As a result of an exhaustive investigation, based on excellent specimens of the Miocene genus *Phororhacos*, Andrews came to the conclusion that the phororhacoids were more closely related to the peculiar cariama and chuña of Brazil and Argentina than to any other birds living or extinct. Research carried out at Field Museum on the splendid material collected by the Marshall Field Expedition has amply substantiated this conclusion. The cariamas are members of the crane order.

Stating to North American readers that the phororhacoids are related to the cariamas is rather like saying that x is related to y. Some information on x has been given in this article, but y is also well worthy of attention. The cariamas are exceedingly interesting not only because of their affinities with the spectacular phororhacoids, but also in themselves. They are long-legged, long-necked birds which stand about two feet in height. Capable of speeds of 25 miles per hour, they run when disturbed and take to the air only as a last resort. Their food generally consists of insects and other invertebrates and the smaller reptiles and mammals, but they will attack larger game when opportunity offers, and they have been known to raise havoc among domestic fowls. Oddly enough, they can be domesticated, and in this condition are reported to act as guardians of the poultry they might otherwise prey upon. They roost and nest in bushes and low trees, activities of which their phororhacoid relatives were incapable. The cariamas have been aptly described as birds which are in transition toward a completely ground-dwelling mode of life. This is perfectly true, but if fragmentary fossil evidence may be relied upon they have remained more or less "fixed" in this transitory condition for millions of years. A logical explanation of this interesting state of affairs at once suggests itself. Cariama, with its marked tendency toward ground-dwelling habits, its insectivorous-carnivorous diet, and its weak powers of flight, is an almost ideal structural descendant for the phororhacoids in which such characters and tendencies were carried to an extreme. It is, in fact, almost certain that the phororhacoids did evolve from an ancestral cariamid which probably was quite similar to the living bird. Once this had taken place, the diversification of the phororhacoids effectively prevented any further offshoots along the same lines from the parent cariamid stock. The latter was thus held down in a state of "suspended transition."

EVOLUTION FAVORS UNSPECIALIZED ANIMALS

The cariamas afford an example of what has come to be known as the "law" of the survival of the relatively unspecialized. They were able to survive the great faunal changes that took place in South America following the elevation of the land bridge at Panama, whereas their much more highly specialized relatives, the phororhacoids, were not. It is probable that in spite of their long history they have lost none of their evolutionary potentiality, and that if all carnivorous mammals were to vanish from the southern continent they would again give rise to a group of carnivorous ground birds whose members might well develop into forms strikingly similar to *Mesembriornis* and its allies.

The preparation of the specimens and the mounting of the skeletal restoration were carried out by Mr. James H. Quinn, Chief Preparator, Division of Paleontology.

Special thanks are due to Dr. Martin Doello-Jurado and Professor Alejandro F. Bordas, of the Museo Argentino de Ciencias Naturales, Buenos Aires, for their courtesy in supplying data on a specimen of *Mesembriornis* in their charge.

THE WORSHIP OF METEORITES

Few natural objects have more generally been worshiped by the human race than meteorites. Instances of the worship of meteorites by the aborigines have been found in the New World. The oldest are probably those revealed by the discovery of meteorites in association with the remains of the Mound Builders. In 1836 white men first saw, in what is now Wichita County, Texas, a mass of meteoritic iron weighing 320 pounds. The meteorite was an object of worship of the Comanche Indians. It was set up at a junction of several trails, and Indians who passed by made a custom of leaving beads, pipes, and tobacco as an offering. A specimen of this meteorite may be seen in Hall 34 of the Department of Geology.—S. K. R.

Fierce Tuareg Fighters

The Tuareg tribes of the Sahara have recently appeared in the war news with hints that they might intervene in some of the strategic struggles in Africa. Field Museum has an exhibit in Hall E illustrating the life of these camel-keeping fighters who are noted for their ferocity.

The Herbarium of Field Museum now contains more than 1,000,000 specimens of plants from all over the world.

SATURDAY AFTERNOON LECTURES ON SCIENCE AND TRAVEL FOR ADULTS TO OPEN MARCH 1

Central and South America—little known islands in the South Pacific—the Arctic regions, the tropics of southeastern Asia, and Africa—all will be subjects of free illustrated lectures in the annual Spring Course on science and travel for adults, to be presented at Field Museum on Saturday afternoons during March and April.

The Museum has engaged noted scientists, naturalists, and explorers who will tell of their achievements in a wide variety of fields, and will show motion pictures (in many cases in natural colors) and stereopticon slides to illustrate their narratives. In one case, the lecturer—Captain C. W. R. Knight, famous British authority on birds of prey, who appears on March 22—will be accompanied by a live eagle.

All the lectures will begin at 2:30 P.M., and will be presented in the James Simpson Theatre of the Museum. The demand for seats makes it necessary to restrict admission to adults; but on the mornings of the same Saturdays the James Nelson and Anna Louise Raymond Foundation will present free motion pictures especially for children.

Following are the dates, subjects, and speakers for the adult programs:

March 1—HEADHUNTERS STILL LIVE.

Dr. Douglas Oliver.

Dr. Oliver, a member of the anthropological staff at the Peabody Museum of Harvard University presents in this lecture the astonishing story of an archaic Stone Age race preserved—like fossils in rock—in a remote and isolated South Sea island, Bougainville. This island is inhabited by the earliest and blackest migrants into the Pacific islands—people who were driven inland onto the forested slopes of active volcanoes by later, stronger races. No trace of the higher civilizations of the Polynesians penetrated into the interior of Bougainville, where natives continued to fell trees and remove human heads with their crude stone axes. Dr. and Mrs. Oliver remained among these people for a year and a half, and observed all phases of their lives.

March 8—BLUE-GREEN WATER.

Wesley Mueller.

By means of undersea photography made possible by special diving equipment, Mr. Mueller illustrates his lecture with natural color films of marine creatures which live their lives far from the eyes of man. These remarkable pictures were made in the waters surrounding the Florida Keys and the Bahama Islands. Many strange types of plant and fish life, and such interesting phenomena as the octopus changing its colors, are shown. In his lecture Mr. Mueller will tell the story of seven months which he and Mrs. Mueller spent last year aboard their yacht *Luray* making these undersea motion pictures.

March 15—MALAY-UTAN.

Joseph Tilton.

Mr. Tilton, who has been a sailor, prospector, miner, newsreel cameraman, and explorer, describes his lecture as "the story of topsy-turvy land, the country of the unbelievable, where lizards fly, where fish climb trees, where deer come in pocket sizes, and the thirsty adventurer finds drinking fountain vines at hand to supply his needs." In motion pictures he presents a fascinating record of the Malay Peninsula in Upper Perak, with its practically virgin jungles almost unknown to white men, but inhabited by pygmies and other wild jungle folk.

March 22—THE LEOPARD OF THE AIR.

Captain C. W. R. Knight.

Captain Knight, former British army officer and internationally known authority on birds of prey, will present the story of his South African Expedition for the National Geographic Society. In Africa, Captain Knight filmed the life story of the crowned hawk eagle, one of the most ferocious of all birds. To obtain his motion pictures of the eagles in their nests, Captain Knight built a hut in a tree and lived in it. The live eagle that he brings to the Museum takes an active part in the program.

March 29—NORTHWEST PASSAGE PATROL.

Richard Finnie.

From the little-known eastern Canadian Arctic, Mr. Finnie brings a documentary film record of an epic voyage to some of the most northerly islands in the world. His films illustrate the folkways of the most primitive living Eskimos. There are many close-ups of Arctic foxes, musk-oxen, and other animals. The films also show Royal Canadian Mounted Police, fur traders, and explorers performing their daily tasks, and Eskimo colonists establishing new trading posts. As official historian and cameraman to the Canadian government, Mr. Finnie has been recording life and events in the far northern reaches of the Dominion for more than fifteen years.

April 5—PERU TODAY—LAND OF THE INCAS.

William B. Holmes.

From the mountains and jungles of Peru Mr. Holmes has brought a spectacular documentary study, in natural color motion pictures, of the country's diversified life. Traveling on foot, on wheels, and by air, Mr. Holmes covered modern and industrial Peru, and the magnificent ruins of buildings representing the past glories of the Inca civilization. Among his adventures was a six hundred-mile automobile trip, traveling in the wrong direction over a dangerous one-way mountain road (by special government permission). This seemingly reckless trip was necessitated by shortness of time in which to reach a great Sunday festival that makes one of his most colorful film sequences.

April 12—ANCIENT AMERICA'S MOST CIVILIZED PEOPLE.

J. Eric Thompson.

Mr. Thompson, for several years a member of the staff of Field Museum, and now connected with the Carnegie Institution of Washington, will present a short outline of the history of the Mayas. The art, architecture, and hieroglyphic writing of this remarkable people will be emphasized. Mr. Thompson will give an account of the present-day Mayas, as well as their ancient ancestors who were the original builders of this civilization. In slides he will show what remains of their early architectural achievements, as well as the contrasting forest and mountain regions the modern Mayas inhabit. The lecture will embody data obtained by various archaeological expeditions to the Maya area for Field Museum.

April 19—TROPICAL RAIN-FOREST OF BARRO COLORADO ISLAND, PANAMA.

Dr. Ralph Buchsbaum.

In his lecture, Dr. Buchsbaum will give an account of the rain-forest of Barro Colorado Island which is situated in Gatun Lake, Panama. This island, where a famous scientific experiment station has been established, has been found by scientists to be an ideal place for the study of tropical plants, animals, rainfall, and climatic conditions. Some of the animals to be shown in the films are exceedingly rare, and have never before been recorded in motion pictures.

April 26—AN ALASKAN ADVENTURE.

Bradford Washburn.

"An Alaskan Adventure" is the tale (illustrated with both motion pictures and slides) of an expedition to the summits of two of Alaska's great unclimbed peaks. The explorers were led by Mr. Washburn for Harvard University and The National Geographic Society. After a reconnaisance of the remote and difficult approaches to Mount St. Agnes (13,250 feet) and Mount Sanford (16,200 feet)—the highest unclimbed peak in North America—these great mountains were attacked during June and July, 1938, by two experienced climbing parties. Airplanes, sledge dogs, and a pack train were combined to make the carefully planned assaults on the peaks.

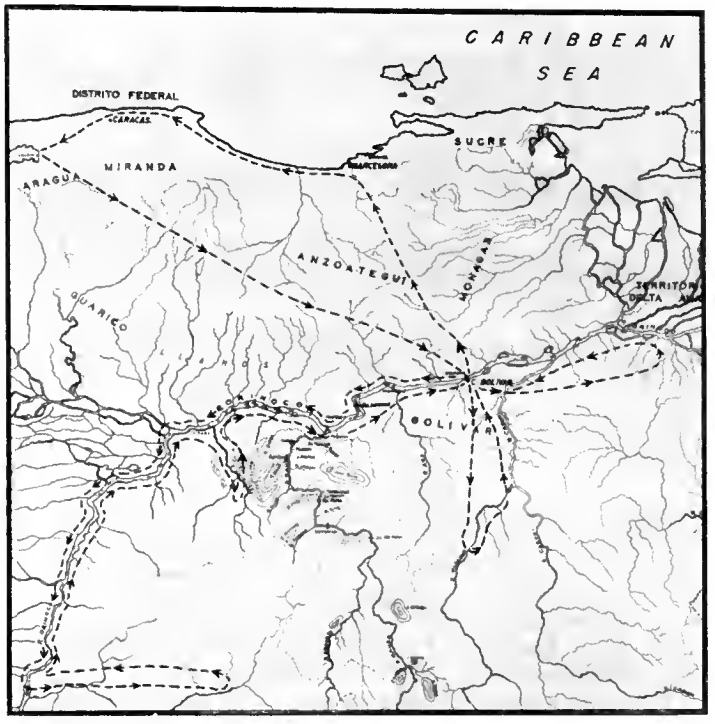
No tickets are necessary for admission to these lectures. A section of the Theatre is reserved for Members of the Museum, each of whom is entitled to two reserved seats. Requests for these seats should be made in advance by telephone (WABash 9410) or in writing, and seats will be held in the Member's name until 2:30 o'clock on the day of the lecture. All reserved seats not claimed by 2:30 P.M. will be made available to the general public.

PAGES FROM THE FIELD NOTES OF A BOTANICAL EXPLORER IN THE VENEZUELAN GUIANA

By LLEWELYN WILLIAMS
CURATOR OF ECONOMIC BOTANY

(Editor's Note:—Curator Williams recently returned from Venezuela where, for more than two years, he was engaged in a botanical survey with Dr. Henry Pittier, the government botanist. Field Museum shared in the resulting collections. Mr. Williams' field notes picture vividly experiences typical of those that befall scientists on expeditions.)

February 28, 1940—We leave Caracas, capital and metropolis, passing the Silla (Saddle) peak that rises 9,000 feet, over a winding road to Los Teques (named after an extinct tribe of warlike Indians). Down a long steep hill we plunge to the valley of Aragua or "garden of Venezuela," livid with green fields of sugar cane.



Peregrinations of a Botanist in Venezuela

Curator Williams' route on collecting and exploratory journey is indicated by dotted line. Traveling by airplane, boat, motor truck, muleback, and on foot, he started from Caracas in upper left hand corner of map, came southeast to Ciudad Bolívar, followed southerly loop on map, then easterly and westerly, and finally returned northward to Caracas via Barcelona. The looping and zig-zagging was strategical, necessitated by various seasonal and topographical considerations.

February 29—Aboard plane leaving Boca del Río, on Lake Valencia. We pass over the high, bare cliffs of San Juan de los Morros, at the entrance to the Llanos, extensive plains flat as a table. The vegetation is stunted ashy-gray, burned by long drought. The climate is malarial; habitations few and far between; population sparse. A winding silvery thread below—my first view of the Orinoco River. Red roofs on the horizon—we are approaching Ciudad Bolívar, commercial center of the Orinoco basin. We have come five hundred miles in two hours.

March 6—After several days' trek overland into the interior of the Venezuelan Guiana, camp is erected—four posts with curata palm leaves for thatch, in an open savanna. Our associates are the amicable members of the Venezuelan Frontier Commission surveying the Brazilian border.

FIRE IN THE FOREST

March 9—It is as dry as a desert—not since 1926, say the local people, has there been such a drought. The distant forest to the north has been burning for days. Fanned by a northeast wind the conflagration is drawing nearer. A pall of blue gray haze and smoke hangs constantly along the edge of the forest; visibility is reduced to about a mile. A note from Ciudad Bolívar reveals that we have been extremely lucky—the establishment in which our equipment had been stored burned down the night after our departure.

March 12, 2 A.M.—Cries of "Fire, fire!" awake us from sound sleep—an Indian is warning us of approaching danger. Not more than 200 yards away an unbroken curtain of fire is sweeping across the prairie, advancing steadily toward our hut. Until dawn we battle against it lustily with cutlasses and tree branches.

March 14—The entire forest seems to be ablaze; at night high flames, like giant torches, lap the crowns of trees 100 feet tall. A strong wind carries the fire toward our hut, in the savanna, threatening our precious collections and equipment; but valiant helpers save the hut and not a single thing is lost. For miles around the formerly green plains have been transformed into a charred carpet. Cattle wander afar in search of pasture—hundreds die from lack of water. Scores of small plantations are destroyed.

March 27 to April 9—The burning savanna is now miles behind us; we have arrived at El Palmar, close to the Orinoco delta, in the land of the Guaraúno Indians. The forest is dense, and still largely unexplored. Great variety of natural products here stirs the thought of anyone interested in economic botany. Chicle, ingredient of chewing gum; balata, a latex (similar to gutta percha) used for covering transmission cables; fragrant tonka-beans, used in perfumes and to impart aroma to tobacco; *cuspa* bark, principal constituent of Angostura bitters; various desirable timbers, and extensive stands of the Moriche palm, which yields a tough fiber used in hammocks. There are many mineral products too—southward are gold mines known to early Spanish explorers who sought the mythical El Dorado. To the north are vast unexploited iron deposits. Even rich sources of diamonds have been found. Yet despite such wealth the people are impoverished and seem extremely lacking in initiative.

April 11 to 20—Ascending the Orinoco to its upper reaches, we follow the route taken by Humboldt and Bonpland 140 years ago. The little steamer *Angostura* makes frequent stops daily to trade and load firewood. The water is turbid with sand. Majestic trees line the banks in an almost endless wall, their trunks and limbs concealed by garlands of vines—in their crotches nestle scarlet or purple orchids—some of the high crowns are covered with blue, yellow or white flowers. Crocodiles rest motionless on sandbanks, and long lines of egrets fly from rock to rock. Each day towards noon a breeze springs up and makes life bearable under the tropic sun. On the eighth day we reach Puerto Paez, at the mouth of the Meta, flowing from Colombia. Our base is established at Puerto Ayacucho.

ANTHROPOLOGY ON THE SIDE

May 5 to 12—A forty-mile trip overland brings us to the mouth of the Sanariapo, above treacherous rapids. Two days in an open canoe handled by five Indians, and we reach the island of El Ratón (The Rat). To the south an unbroken forest extends to the Brazilian frontier, once exploited for rubber, and still a rich source of palm fiber (*piassaba* or *chiquechique*) used for making brushes. But this territory is still largely unexplored, and inhabited only by the Maquiritare, Guajibo, Guajaribo, Piaroa, and Yaruro Indians. The Maquiritares travel during the dry months from their settlement in the upper Caura to the Ventuari and Brazilian frontier, bartering canoes, and even *dogs!* for guns, ammunition and, above all, salt. The Guajibos live in forests of the Vichada and Tomo rivers, have tattoo-like bluish or pinkish discolorations, generally around the nose. The nomadic Piaroas, of the upper Parguaza and Ventuari regions, are short and stocky—they frequently clear patches of forest to grow manioc, source of their starchy food. They excel in making palm wood blowpipes, and in the preparation of *curare*, the plant poison applied to the tips of spears, arrows, and darts for hunting. The formula, a closely guarded secret, is known only to the older men—the basic raw material is the bark of a woody vine of the strychnine family. To be effective the poison must come in direct contact with the blood stream. Its fatal

effect on small birds occurs within two or three minutes. To counteract its toxic qualities ordinary salt must be applied to the wound, and also be taken by ingestion.

Other plants likewise are used for their narcotic or stimulating properties. The Piaroas collect the bean-like fruits of the "yopo" tree (*Piptadenia peregrina*), grind the ripe seeds to a fine powder, and inhale it. Legend tells of a feast at which the men became intoxicated on yopo seeds and committed the unforgivable crime of killing their chieftain. Upon recovering their senses they "avenged" his death by throwing themselves over a high cliff, now known as the Rock of the Piaroas (*La Laja de los Piaroas*). Bones are still found around the base of the cliff, but their connection with this event has never been proved.

May 30—Flying from Puerto Ayacucho toward the Brazilian frontier; below us the forest spreads everywhere—an awe-inspiring sight, unknown even to the wandering Indians! In the many miles covered in two and one-half hours of high-speed flying we have seen not a single habitation. We ascend to 8,000 feet over a densely-wooded mountain range. Broad flat savannas come into view; now the plane glides to a stop. We are greeted by a Maquiritare Indian, his three female companions, and a boy. Camp is pitched on the bank of the Ventuari. The water is limpid, the atmosphere cool. No mosquitoes disturb our rest, and the only noise is the occasional terrifying roar of a jaguar or the harsh voices of *araguatos* (howling monkeys), which make the air seem to vibrate.

June 4—We depart on the *Angostura* for Caicara. Most of the passengers are men returning from the forests, after several months of gathering tonka-beans, which they sell for $1 to $1.50 a pound.

June 7—Inland toward the Cuchivero River. We meet a large group of wandering Panare Indians in search of the oily fruits of the Coroba palm (*Jessenia polycarpo*), from the pulp of which they make *arepas*, resembling johnny-cake.

June 12 to 15—Accompanied by Carabaño, the Panares' chieftain, we go on an extended trip to the upper Cuchivero in search of "barbasco caicareño," a plant poison used in macerated form to contaminate water and stupefy fish. It is now of economic value on account of its rotenone content, used as an ingredient of insecticides.

TEMPEST ON THE RIVER

June 28—We return to Caicara to embark the following day on the *Angostura*, and continue the journey back to Ciudad Bolívar. But the boat is ready to depart and there is insufficient time to crate and load the specimens.

June 30—We leave Caicara on a sister ship, the *Meta*, overtaking the *Angostura* during the night.

July 1—Gusts of strong wind churn the usually placid waters of the Orinoco into high waves, and a funnel-shaped mass appears on the horizon—sure signs of an approaching tempest, or *chubasco* as the natives call it. The sky turns red, low banks of black clouds begin to form, followed by fitful showers. Sandspouts spring up on the banks. The captain decides to seek refuge along the bank to ride out the storm.

July 2—The rounded hill of Ciudad Bolívar, with low blue-and-white buildings along the waterfront, comes into view.

July 3—We proceed to the village of Soledad, on the opposite bank, crossing the Orinoco at the narrowest point in its entire length, whence was derived Ciudad Bolívar's original name, Angostura. The rainy season has set in and it will take a week to traverse the rough road, 500 miles long, through the desolate Llanos. News reaches Ciudad Bolívar that the *Angostura* has been shipwrecked, a victim of the squall experienced three days ago.

July 5—Forced to wait for several hours beyond Pariaguan until a flooded stream has receded; rain, falling in torrents, makes the road almost impassable.

July 8—Caracas once again, and now begins the task of classifying the large collections, the result of four months' labor in the field, and to select duplicate material for dispatch to Field Museum.

Michigan Educators Visit Museum

During February, Field Museum was host to three groups of members of the School Officers' Institute conducted by the School of Education at Northwestern University. There were approximately sixty men and women in each group. After luncheon meetings in the Museum Cafeteria, they were conducted on tours of the exhibits by members of the staff of the James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures.

The vegetable origin of coal is illustrated by a collection of fossil leaves found in coal, and the stump of a large tree found in a mine, now on exhibition in Hall 36 of the Department of Geology.

MARBLE LIONS FROM CHINA NOW ON EXHIBITION IN HALL 24

A pair of monumental carved stone lions of the eighteenth century, from China, presented to Field Museum recently by Mrs. Frederick S. Fish, of South Bend, Indiana, and New York, is now on exhibition. The sculptures stand as silent sentinels at the entrance to George T. and Frances Gaylord Smith Hall of Chinese Archaeology (Hall 24).

The lions are "conventionalized," in the technical sense of that word as employed in art terminology. This conventionalization may be attributed to the fact that, because the lion is not native to eastern Asia, it is to the Chinese more of an imaginary animal than a real one, it is explained by Mr. C. Martin Wilbur, Curator of Chinese Archaeology and Ethnology.

These lions came from Peking where they once guarded the entrance of a government building when that city was the capital of the Manchu Empire. When such mythical lions are placed in pairs before important edifices, the male sits at the right playing with a sphere supposed to be the sun, while the female, shown suckling her young from her paw, is placed at the left. Mrs. Fish presented the sculptures to Field Museum in memory of her father, the late John M. Studebaker. In recognition of this notable gift, the Trustees of the Museum recently placed Mrs. Fish's name on the institution's list of Contributors, an honor which continues in perpetuity.

"Conventionalized" Lion Attracts Children

Chinese conception of "king of beasts" in carved stone arouses curiosity of George Chubb, Beverly Jameson, and Burton Sandberg, pupils of Harvard Public School. A pair of these lions, presented to the Museum by Mrs. Grace Studebaker Fish, now stands at the entrance to George T. and Frances Gaylord Smith Hall.

Field Museum of Natural History
FOUNDED BY MARSHALL FIELD, 1893
Roosevelt Road and Field Drive, Chicago
TELEPHONE: WABASH 9410

FIELD MUSEUM NEWS
CLIFFORD C. GREGG, *Director of the Museum* ... *Editor*

CONTRIBUTING EDITORS

PAUL S. MARTIN ..... *Chief Curator of Anthropology*
B. E. DAHLGREN ..... *Chief Curator of Botany*
HENRY W. NICHOLS ..... *Chief Curator of Geology*
KARL P. SCHMIDT ..... *Chief Curator of Zoology*
H. B. HARTE ..... *Managing Editor*

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

INDIAN SILVER

When the Spanish entered the Southwest, the Navajo were a marauding, nomadic tribe. With the advent of the white man, the life of this tribe has changed completely. The Navajo borrowed many things from the Spanish—sheep, horses, cattle, and the art of working silver.

The Navajo copied Spanish jewelry and invented forms of their own. Their designs are derived both from the silver trade-jewelry given to the tribes east of the Mississippi, and from Spanish-Mexican costume ornaments and bridle trappings.

Originally silver was obtained by melting Spanish and Mexican coins. Today the Navajo use metal from various sources. The tools are few and simple—a hand bellows, a forge, and a small anvil.

The Navajo made beads, necklaces, buttons, belts, bridle mounts, rings, and bracelets, often set with turquois. The most familiar design is the so-called thunderbird. The jewelry is massive and masculine.

The Spanish Conquistadores were not the only Europeans to introduce silver work to the Indians. During the seventeenth century the French traders introduced silver brooches, like those made for the Scotch Highlanders, to the Central Algonkin tribes.

The Sauk and Fox Indians copied these brooches and also made rings and bracelets. The silver probably came from old brooches and coins obtained from the traders. The rings made by the native silversmiths were often set with abalone shells also obtained from the traders; the bracelets bore designs consisting of converging lines and circles.

Plain brooches were worn as trimming on women's clothes. They were sewn around the collar, on the shoulders, and along the bottom of the blouse. An ornate brooch created the finishing touch.

With the growth of the United States the Central Algonkin tribes were pushed farther and farther west. Silver work was forgotten in the losing struggle for an existence. Today they are a broken people scattered over several reservations in Iowa, Kansas, and Oklahoma. The Navajo, however, survived the western thrust of the whites. In fact, this thrust helped create a growing market for their arts and crafts, particularly their silver jewelry. With the growth of this market the Navajo have flourished.

In Hall 6, Case 10, is an exhibit of Navajo silver jewelry. Sauk and Fox silver ornaments are displayed in James Nelson and Anna Louise Raymond Hall (Hall 4), Cases 17 and 18.

Staff Notes

Major Clifford C. Gregg, Director, has been elected a Fellow of the American Association for the Advancement of Science.

Mr. Melvin A. Traylor, Jr., has been appointed an Associate in Ornithology. Mr. Traylor, who was graduated from Harvard in 1937, has conducted several ornithological expeditions to Yucatan and Campeche. The collection of little known birds from the latter Mexican state, resulting from his work, is the most important such collection known. He has presented his collection to the Museum, and is working regularly in the laboratories on research projects. A publication reporting on the Campeche collection will soon be issued by Field Museum Press. At present Mr. Traylor is a member of the zoological expedition to the Galapagos Islands aboard Mr. Leon Mandel's yacht.

Dr. Henry Field, Curator of Physical Anthropology, has been granted leave of absence from the Museum to accept a temporary special assignment in the Library of Congress, Washington, D.C. Dr. Field will work on a project in connection with the Library's southwestern Asiatic division.

Mr. Elmer S. Riggs, Curator of Paleontology, visited the Carnegie Museum, Pittsburgh, to arrange fossil exchanges.

Dr. Wilfrid D. Hambly, Curator of African Ethnology, lectured before the Geographic Society of Chicago at the Goodman Theatre, February 3, on "African Negroes."

Mrs. Leota G. Thomas, of the Raymond Foundation Staff, is teaching an Indiana University Extension course at Hammond.

Swedish Botanist Visits Museum

Professor Erik Asplund, of the Botany Department in the Natural History Museum at Stockholm, Sweden, spent more than a week last month at Field Museum conferring on botanical problems with members of the staff of this institution. Professor Asplund recently came to the United States after two years in Ecuador and Peru where he collected plants for the Swedish museum. He is especially interested in Andean plants, and made a study of those in the Herbarium of Field Museum. He is awaiting completion of arrangements by the warring countries which will enable him to sail for home.

MANDEL EXPEDITION REPORTS FROM GALAPAGOS

The zoological expedition to the Galapagos Islands, on board the yacht *Carola* through the courtesy of the owner, Mr. Leon Mandel, recently reported excellent progress in obtaining collections for Field Museum. A radiogram to Major Clifford C. Gregg, Director of the Museum, signed jointly by Mr. Mandel and Dr. Wilfred H. Osgood, Curator of Zoology Emeritus and head of the scientific personnel on board, stated that five islands in the group had been worked, and that a large number of desirable specimens had been obtained. More than 300 fishes of some fifty different species, some believed to be hitherto unrecorded in piscatorial annals, have been caught. Especially large specimens are a 340-pound striped marlin caught off Panama where this species had never before been recorded, and a twelve-foot manta (a giant species of ray or devil-fish), which members of the expedition harpooned and landed after a long fight. The expedition has collected also about one hundred birds.

A FEW FACTS ABOUT FIELD MUSEUM

Field Museum is open every day of the year (except Christmas and New Year's Day) during the hours indicated below:

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

Free courses of lectures for adults are presented in the James Simpson Theatre on Saturday afternoons (at 2:30 o'clock) in March, April, October, and November.

A Cafeteria serves visitors. Rooms are available also for those bringing their lunches.

Chicago Motor Coach Company No. 26 busses provide direct transportation to the Museum. Service is offered also by Surface Lines, Rapid Transit Lines (the "L"), interurban electric lines, and Illinois Central trains. There is ample free parking space for automobiles at the Museum.

SUNDAY LECTURES IN MARCH ON GEMS AND JEWELS

"Gems, Jewels and 'Junk'" will be the subject of the Sunday afternoon lectures to be presented at Field Museum during March by Mr. Paul G. Dallwig, the Layman Lecturer. Mr. Dallwig's story will trace precious and semi-precious gem stones from their original home in the mother-rocks to their ultimate resting place in a museum collection, a jewelry store, or milady's personal jewel chest. He will tell about the superstitions that led to the customs of wearing gems as talismans, amulets, and charms against evil and illness, to bring good luck, or further the cause of love. He will also reveal how imitation and synthetic gems are produced, and how to test them to ascertain artificiality. The lecture will be illustrated with exhibits among the mineral collections in the Department of Geology.

To meet the demands for accommodations, the same lecture will be presented on each of the five Sundays of the month (March 2, 9, 16, 23, and 30). Lecture audiences assemble promptly at 2 P.M. Because the number that can be conducted among the exhibits under comfortable circumstances on a lecture of this type is limited, it is necessary to make reservations for all Sunday lectures well in advance. This may be done by mail or telephone (WABash 9410). Children cannot be accommodated. The lectures last until 4:30 P.M. with a half-hour intermission midway. During this interval those who desire to smoke or obtain refreshments may do so in the Cafeteria, where special tables are reserved for the group.

On Sundays in April Mr. Dallwig will supplement the general lecture on gems with "The Romance of Diamonds from Mine to Man." Reservations for the April, as well as the March lectures, are currently being taken at the Museum.

Fossil Plants and Invertebrates

Extensive collections of invertebrate fossils and fossil plants are displayed in the west half of Frederick J. V. Skiff Hall (Hall 37). These exhibits are arranged in two distinct series—stratigraphic and systematic. The stratigraphic series consists of plants and animals of the successive geological periods from the Cambrian to the Pleistocene. This arrangement shows that each important geologic period is characterized by a more or less distinctive group of plants and animals, and that life moved in an orderly succession from the simple to the more complex forms. Furthermore, this series furnishes evidence helpful in the determination of the age of rocks in which the fossils occur, and supplies a record of the distribution of the ancient seas and lands.

The systematic series consists of the different classes of animals and plants arranged according to their biologic position. The object of this series is to show the characteristic features of each of the great groups of organisms, and their relationships to other forms. Visitors may find also in this series examples of the many animals which in the geologic past played an important role upon the earth, but have since disappeared leaving no descendants. These form an especially interesting group in the evolutionary scale.

THINGS YOU MAY HAVE MISSED

ARMADILLOS—3-Banded Kind Rolls Up, but Giant Species Burrows, for Protection

There is a popular belief that the armadillo rolls up in its shell as a means of protection. This is only one-tenth true, as there are ten kinds of armadillos, and only one of them—the three-banded armadillo (*Tolypeutes tricinctus*)—really rolls up.

This species has a thicker, harder shell, and heavier plates in its head and tail than other armadillos. When rolled up, the edges of the front half of the shell fit inside the edges of the posterior half, and the head and tail lie side by side. In this position, it is safe from most of the carnivores.

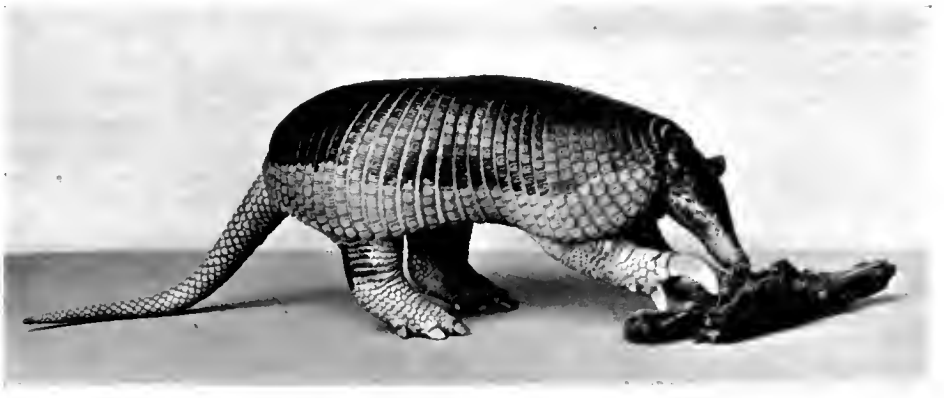
This armadillo does not always immediately assume this position when approached, but lies on its side with the shell partly closed. If touched on the abdomen or chest, the shell snaps together like a steel trap. Any mammal that had its nose or paw pinched in this trap would certainly be wary of the next three-banded armadillo it might encounter. A pack of Brazilian dogs with which the writer once hunted never showed any interest in these armadillos, but did attack both the six-banded and the nine-banded species. It is of interest that an animal with such absolute protection by means of its armor should have developed so characteristic an instinct.

The three-banded armadillo is found from Pernambuco in northeastern Brazil, south through Matto Grosso and Paraguay, to northern Patagonia. Specimens of the animal may be seen, together with many of its relatives, in Field Museum's systematic collection of mammals in Hall 15.

Various other armadillos are represented by specimens in the Hall 15 exhibit, including the giant armadillo illustrated on this page. 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. Despite its size, the latter is able to burrow under ground with amazing speed, and for this reason is seldom seen alive. It ranges from British Guiana to central Brazil.—C.C.S.

A Unique Armadillo

Exhibit in Hall 15 showing the three-banded armadillo, which differs from its relatives in many ways. It has the hardest carapace, with rigid shields, and it is the only armadillo that rolls itself into a ball, as seen on the right, for protection. It is also the only species that walks on the tips of the nails of its forefeet.



Largest of All Armadillos

Known as the giant armadillo, this species, also exhibited in the Hall 15 collection, is seldom seen alive. Although more than four feet long, it has the ability to dig hiding places in the ground with truly startling rapidity.

RAYMOND FOUNDATION OFFERS CHILDREN'S FILM PROGRAMS

The annual spring series of free motion picture programs for children, presented at Field Museum by the James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures, will begin on March 1, and continue thereafter each Saturday morning throughout March and April. There will be two showings of the pictures on each program, one beginning at 10 A.M., and one at 11. Children from all parts of Chicago and suburbs are invited, and no tickets are required for admission. The Museum is prepared to receive large groups from schools and other organizations, as well as individual children coming alone or accompanied by parents or other adults. Teachers are urged to bring their classes.

The following schedule shows the titles of the films to be presented on each day:

March 1—CLOUDY AND COLDER—PROBABLY SNOW (*The story of weather*); and a cartoon.

March 8—FOUR FEET AND FUR (*Animals tamed and untamed*); and a cartoon.

March 15—NATURE ON THE WING (*Birds and bugs*); and a cartoon.

March 22—THE SONG OF CHINA (*Produced in China with Chinese cast*).

March 29—ANIMAL LIFE OF THE SWAMPS (*Insects, plants, birds, and animals*); and a cartoon.

April 5—THE FOREST (*Celebration of Arbor Day*); and a cartoon.

April 12—BALANCING NATURE'S BUDGET (*A story of conserration*).

April 19—SUDAN (*Story of natires in the heart of Africa*).

April 26—A DAY AT BROOKFIELD ZOO; and a cartoon.

GIFTS TO THE MUSEUM

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

Department of Anthropology:

From Thomas C. Barger, Linton, N. D.—190 pottery sherds, Saudi Arabia.

Department of Botany:

From Felix Woytkowski, Lima, Peru—38 herbarium specimens, Peru; from Rev. Padre Cornelius Vogl, Caracas, Venezuela—353 herbarium specimens, Venezuela; from Rev. Brother Elias, Caracas, Venezuela—148 herbarium specimens, Venezuela; from Gregorio Bondar, Bahia, Brazil—20 palm seeds, Brazil; from Illinois State Museum, Springfield—143 herbarium specimens, Illinois; from Professor A. O. Garrett, Salt Lake City, Utah—100 herbarium specimens, Utah.

Department of Geology:

From William E. Menzel, Chicago—29 onyx marble cabochons; from A. G. Richman, LaCrosse, Wis.—a specimen, from Africa, showing a large ant encased in copal; from Charles S. Ryland, Golden, Colo.—3 mineral specimens, New Mexico; from A. V. Konsberg, Chicago—a concentrically weathered chert boulder, Texas.

Department of Zoology:

From Misses Ruth and Ellen Carlson, Glen Ellyn, Ill.—a pedigreed manx cat; from Chicago Zoological Society, Brookfield, Ill.—5 mammals, 6 birds, a viper, and a capybara; from Lincoln Park Zoo, Chicago—an anaconda and a sharp-nosed crocodile, South America and Africa; from Leslie Hubricht, St. Louis, Mo.—936 specimens comprising one species and four subspecies of snail (genus *Amnicola*), including three paratypes, Ozark Mountains, Missouri.

The Library:

Valuable books from Dr. Henry Field, Chicago.

MARCH GUIDE-LECTURE TOURS

Conducted tours of exhibits, under the guidance of staff lecturers, are made every afternoon at 2 o'clock except Saturdays, Sundays, and certain holidays. Following is the schedule for March.

Week beginning March 3: Monday—Expeditions Into the Past (Mr. Bert E. Grove); Tuesday—General Tour; Wednesday—The Carved Jades of China (Miss Elizabeth McM. Hambleton); Thursday—General Tour; Friday—South American Plants (Miss Marie B. Pabst).

Week beginning March 10: Monday—The Everlasting Hills (Mr. Bert E. Grove); Tuesday—General Tour; Wednesday—The Races of Man (Mrs. Leota G. Thomas); Thursday—General Tour; Friday—Designs in Wood (Miss Marie B. Pabst).

Week beginning March 17: Monday—Minerals and Early Man (Mr. Bert E. Grove); Tuesday—General Tour; Wednesday—Animals That Hibernate or Migrate (Mrs. Leota G. Thomas); Thursday—General Tour; Friday—Spring Woodlands (Miss Marie B. Pabst).

Week beginning March 24: Monday—The Cradle of Civilization (Mr. Clarence L. Brown); Tuesday—General Tour; Wednesday—Materials and Design in Primitive Clothing (Mrs. Leota G. Thomas); Thursday—General Tour; Friday—Game Animals of Illinois, Michigan and Minnesota (Miss Elizabeth Best).

Monday, March 31—Men of the Stone Age (Miss Elizabeth McM. Hambleton).

Persons wishing to participate should apply at North Entrance. Tours are free. By pre-arrangement with the Director, special tours are available to parties.

Visiting Hours Change March 1

Beginning March 1, spring visiting hours, 9 A.M. to 5 P.M., will replace the winter schedule of 9 to 4. The new hours will continue in effect until April 30, after which the Museum will be open from 9 A.M. to 6 P.M. until September 1 (Labor Day).

NEW MEMBERS

The following persons became Members of Field Museum during the period from January 16 to February 15:

Associate Members

John S. Burchmore, Richard F. Gibbs, Samuel P. Gurman, Maurice Marwick.

Annual Members

John G. Allbright, C. J. Barkdull, F. W. Barta, John P. Bent, Mrs. Perry B. Buchanan, Percival R. Charnock, Mrs. William H. Cope, Lowes E. DeWeese, Harry Dinkelman, C. Joseph Dirckx, Maurice M. Dreyfus, Fred R. Eiseman, Charles M. Geraghty, Wendell E. Green, Ralph F. Himmelhoch, John J. Hoellen, Jr., Alfred Holzman, Mrs. Leo L. Honor, Roger F. Howe, Miss Elizabeth J. Hurlbut, Hyman Kaplan, Clarence B. Kenney, W. Paul McBride, Robert Osgood McCullough, Mrs. J. A. Mudd, Jr., Edward Murrin, Dr. Robert R. Mustell, Mrs. Thomas F. Myers, Jr., G. A. Norton, W. T. Osgood, Mrs. Bartholomew O'Toole, C. R. Overholser, William A. Patterson, Holman D. Pettibone, William F. Sloan, Mrs. Edward Summer, Dr. Frederick C. Test, William F. Weber.

Australian aborigines still live in a Stone Age state of culture. An interesting exhibit illustrating the survival of their simple, primitive habits is on exhibition in Hall A-I.

MEMBERSHIP IN FIELD MUSEUM

Field Museum has several classes of Members. Annual Members contribute $10 annually. Associate Members pay $100 and are exempt from dues. Sustaining Members contribute $25 annually for six consecutive years, after which they become Associate Members and are exempt from all further dues. Life Members give $500 and are exempt from dues. Non-Resident Life Members pay $100, and Non-Resident Associate Members $50; both of these classes are also exempt from dues. The Non-Resident memberships are available only to persons residing fifty miles or more from Chicago. Those who give or devise to the Museum $1,000 to $100,000 are designated as Contributors, and those who give or devise $100,000 or more become Benefactors. Other memberships are Honorary, Patron, Corresponding and Corporate, 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.

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 for federal income tax purposes.

Endowments may be made to the Museum with the provision that an annuity be paid to the patron for life. These annuities are guaranteed against fluctuation in amount, and may reduce federal income taxes.

PRINTED BY FIELD MUSEUM PRESS

Field Museum News

Published Monthly by Field Museum of Natural History, Chicago

Vol. 12 APRIL, 1941 No. 4

GALAPAGOS ISLANDS YIELD RARE SPECIMENS TO LEON MANDEL EXPEDITION

By WILFRED H. OSGOOD
CURATOR EMERITUS, DEPARTMENT OF ZOOLOGY

The Leon Mandel Galapagos Expedition which sailed from Havana, Cuba, on January 8, docked at New Orleans March 10 after a very successful voyage. This expedition was generously financed by Mr. Leon Mandel, of Chicago, and transported on a 247-foot yacht which he chartered. Field Museum was represented by Mr. Rudyerd Boulton, Curator of Birds; Mr. Loren P. Woods, Assistant Curator of Fishes; Staff Taxidermist Leon L. Walters; Mr. Melvin Traylor, Associate in Ornithology; Ronald Lambert, volunteer assistant taxidermist and submarine diver, and the writer. Other members of the party, besides Mr. and Mrs. Mandel, were Mr. William Gray, well-known fishing guide of West Palm Beach, Florida, and Mr. Fred Whaler, of Balboa, Canal Zone. Guests on the return trip were Dr. Herbert Barker, of Chicago, who joined at Talara, Peru, and Dr. W. P. Armstrong, Jr., who came aboard ship at Balboa.

Merrill-Chase photo

Mr. Leon Mandel

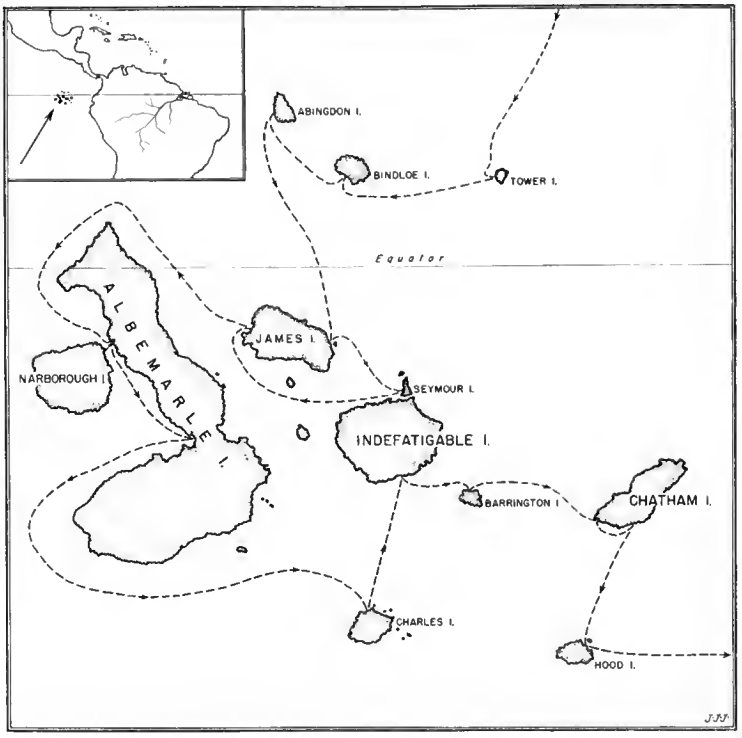
From Havana the expedition proceeded to Panama and after passing through the canal went directly to the Galapagos Islands. Mr. Mandel, who carried special equipment for big game fishing and devoted much effort to it, lost no time in trying the Pacific waters. On the first day after leaving Panama, a line was put out from the stern of the yacht while it was going at a speed of about twelve knots. This experiment, which was intended more to locate than to catch fish, was rewarded with almost immediate success, for within ten minutes the bait was struck by a large marlin. After a fight of an hour and thirty minutes, the fish was hauled on board. During this time, by the skillful co-operation of Captain John R. McGuire, the ship was maneuvered backward, forward, and from side to side as needed. The fish proved to be a striped marlin weighing 340 pounds, a species not previously taken in these waters.

Quite unprecedented also was the feat of hooking and landing a fish of this type from a large vessel going at full speed. The position of the ship at the time was about Lat. 6° N. and Long. 81° 10′ W. A few days later a black marlin, weighing 347 pounds, was taken by Mr. Mandel near Tower Island, but at Banks Bay, Albemarle Island, and other localities where marlin have been reported, none were found.

The expedition began systematic collecting of Museum specimens at Tower Island, and from there worked southward through the entire archipelago, touching at all the larger islands and nearly all the smaller ones. Landings were made at the following islands: Tower, Bindloe, Abingdon, Bartholomew, James, Seymour, Albemarle, Narborough, Charles, Champion, Onslow, Indefatigable, Barrington, Chatham, Gardner, and Hood. This extensive itinerary was covered in twenty-four days, but although stops were brief, important collections were made at every island, thus producing a result in total that is exceedingly varied and comprehensive. Special efforts were made to secure the land birds and reptiles of each island, and collecting of fishes and invertebrates was carried on continuously.

Mrs. Mandel (right), with Senora Alvear, wife of the Governor of the Islands, and Dr. Osgood, aboard the expedition yacht at Chatham Island.

One of the principal objects was the securing of specimens, under-water studies, and color photographs for a large habitat group of the interesting fishes of the islands. Everything needed for such a group was obtained and specially prepared. It will show a bottom scene based mainly on conditions as found in Tagus Cove, Albemarle Island, where there is a varied wealth of smaller animal life such as starfishes, sponges, sea anemones, sea urchins, bryozoans and crustaceans. Against a background in which these animals are featured there will be a display of the incredibly numerous fishes of small and medium size which inhabit the waters about the islands. Many of these are of brilliant coloration and bizarre form. Among them is the famous golden grouper, a fish entirely bright golden yellow in color like some varieties of domestic goldfish, but reaching a weight of 40 to 50 pounds. Altogether, some 1,500 specimens of fishes, belonging to nearly 200 species, were taken. Most of these go to enrich the Museum's study or reference collections, but many were



Route of the Mandel Expedition Through the Galapagos Islands

especially selected and prepared to fill immediate needs for exhibition.

Of especial interest is a manta, giant ray, or "devilfish," a species which grows to enormous size and one which offers many difficulties both in its capture and in its preparation. One of these was harpooned by Mr. Mandel near Seymour Island, and hauled out on a sand beach where Mr. Walters and Mr. Lambert spent two days

"Devilfish" in Plaster

Members of the expedition making casts of the giant ray, or manta, on Seymour Island. This strange sea denizen will make one of the most spectacular Museum exhibits to result from the Mandel expedition.

and nights working with all possible speed to make careful studies and a complete plaster mold of it before the burning equatorial sun rendered it unfit. The heavy molds, reinforced with iron piping, were then transported to the ship and safely dried and crated for subsequent shipment to the Museum.

Collecting of birds was carried on at every stop, and all the more important species characteristic of the different islands were obtained in sufficient numbers to demonstrate the variations which have such interesting bearings on problems of evolutionary changes in living species. In addition to the land birds, many large water birds were taken, including all those peculiar to the Galapagos Islands, that is, those found there and nowhere else.

The large land tortoises, for which the islands were named, and which were formerly so numerous on all the larger islands, are now either extinct or confined to remote and almost inaccessible parts of certain islands. Owing to limitations of time and weather conditions, no attempt was made to penetrate far into the interior and none of these giant tortoises were collected, but several were purchased by Mr. Mandel from local residents and brought back alive for presentation to the Chicago Zoological Society. Especially due to the interest of Mrs. Mandel, various other live animals were obtained, carefully fed and ministered to for some weeks, and ultimately presented in unusually fine condition to the Brookfield and other zoos. Among them were Galapagos penguins, albatrosses, frigate birds, boobies, and several of the large land iguanas peculiar to the islands.

The expedition encountered somewhat unusual weather conditions during the time it was in the archipelago. No evidence of the Humboldt current was found, and surface temperatures of the water ranged from 77° to 86°, most of the time nearer the latter figure. Vegetation was green and luxuriant throughout, not only at the higher levels but down to the shore, and temporary lagoons or small streams of fresh water were not infrequent. Rain fell nearly every day, often in heavy downpours. Although the season was that when a certain amount of rain is expected, it was evident that somewhat abnormal conditions prevailed, doubtless due to some alteration in the usual relations of the ocean currents.

After leaving the islands, the expedition moved to the coast of Peru at Talara and Cabo Blanco for a few days' game fishing, and then set a course for Cocos Island. On the way there, fishing with night lines resulted in the acquisition of a giant squid, an almost fabulous animal well deserving the title "sea monster." In the vicinity of Cocos Island further additions to the collections were made and a number of Pacific sailfish were caught by Mr. Mandel, including some of almost record length but proportionately small weight, and others of unusually small size and weights below 50 pounds. This aroused the suspicion that we might be at or near one of the unknown principal breeding grounds of this

Harpooned by Mr. Mandel

Dr. Osgood and Taxidermist Leon L. Walters examining dolphin hauled to the deck of the yacht. Mr. Mandel skillfully landed many magnificent fishes, some with the harpoon, and more with rod and reel.

famous fish. A few days later, between Cocos and Panama, these suspicions were confirmed by catching with a night light and dipnet two tiny, perfectly formed sailfish less than five inches in length.

Not least of the tangible results of the expedition were the numerous photographs taken. All in color, both motion and still pictures, these form a record of activities and supplement the collections. Especially interesting and valuable are many color photographs of living fishes, the natural colors of which disappear immediately after death. These guarantee accurate preparation of exhibits, to say nothing of settling arguments as to what changes can occur.

Permission to cruise through the islands was granted by the Ecuadorean government, and its representative on Chatham Island received the party most courteously.

SATURDAY AFTERNOON LECTURES CONTINUE THROUGH APRIL

Four more lectures in the spring course for adults, presented by Field Museum on Saturday afternoons, remain to be given during April. Noted scientists, naturalists, and explorers will appear, and their lectures will be illustrated with motion pictures and stereopticon slides.

Due to illness, **Mr. William B. Holmes who was originally scheduled to lecture April 5 on "Peru Today—Land of the Incas," will be unable to appear. His place will be taken by Mr. Edgar R. Hoff, who will lecture on "Birds and Animals of the Rockies,"** illustrating his subject with several reels of motion pictures in natural colors.

All the lectures will begin at 2:30 P.M. and will be presented in the James Simpson Theatre of the Museum. The demand for seats makes it necessary to restrict admission to adults; but on the mornings of the same Saturdays the James Nelson and Anna Louise Raymond Foundation will present free motion pictures especially for children.

Following are the dates, subjects, and speakers for the adult programs:

April 5—BIRDS AND ANIMALS OF THE ROCKIES.
Edgar R. Hoff.

April 12—ANCIENT AMERICA'S MOST CIVILIZED PEOPLE.
J. Eric Thompson.

April 19—TROPICAL RAIN-FOREST OF BARRO COLORADO ISLAND, PANAMA.
Dr. Ralph Buchsbaum.

April 26—AN ALASKAN ADVENTURE.
Bradford Washburn.

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. Requests for these seats should be made in advance by telephone (WABash 9410) or in writing, and seats will be held in the Member's name until 2:30 o'clock on the day of the lecture. All reserved seats not claimed by 2:30 P.M. will be made available to the general public.

WILD FLOWER LEAFLETS—

Of special interest and usefulness to those who seek ability to recognize wild flowers appearing at this season are illustrated leaflets, *Spring Wild Flowers*, and *Spring and Early Summer Wild Flowers*, published by Field Museum. J. Francis Macbride, Associate Curator of the Herbarium, is the author. The booklets are on sale at THE BOOK SHOP of the MUSEUM —25 cents each.

MEDICAL SCIENCE WAS FATHER OF BOTANICAL STUDIES

By J. FRANCIS MACBRIDE
ASSOCIATE CURATOR OF THE HERBARIUM

Many of the earliest books described the plants of the world not because of their utility or their beauty but because of their importance in medicine. For centuries herbs were the main source of drugs, and since man has always suffered sickness, real or fancied, one of his first interests in the use of printing was directed to the cataloguing of the plants that seemed to provide cures, or at least some relief, for his ailments.

One of the learned men of the early sixteenth century who completed a book setting forth the characteristics and medicinal properties, then called "virtues," of many plants was Leonhard Fuchs, whose qualification for his botanical work was that of a professor of medicine. This compilation was carried on from 1535 to 1565 at the University of Tübingen in Germany, although Fuchs' *herbal*, as books of this sort were designated, was published in Basel, Switzerland, in several editions for various countries.

Famed, then, was Professor Fuchs in his day. So, quite naturally, the great Linnaeus, when he was renaming most of the plants and animals known about a century later, followed the suggestion of the erudite scholar Plumier (who had preceded him by a generation) and established for all time the name *Fuchsia*, in honor of Fuchs, for the plants we generally and too casually speak of as "fushas." If Herr Fuchs had happened to have been born an Englishman, he would probably have been Mr. Fox and the flowers "foxias."

"And just what *are* fuchsias?" someone may ask. Well, if you are living in Chicago you will have known them only in a greenhouse, or "set out" during warm weather in a window box or garden—bushy plants with glossy foliage and long tubular bright red, or red and purple, or red and white flowers that droop gracefully on slender stalks, sometimes solitary, sometimes paired. Or now and then there are a number of the lovely flowers clustered and pendant from near the tips of wand-like branches, the red sepals spreading or recurved, the petals often of another shade, purplish or white, the stamens exserted, almost fringe-like—charming flowers that I hope you will now recall.

You know them with familiarity if you live in a climate with a long growing season or no frost at all. There, as in their native habitats, fuchsias may be trained to flourish on low fences or to form hedges or borders where their beautiful foliage, varied colors, and graceful habit have made them popular ever since they were justly appreciated in England in the later eighteenth century. This is attested by many color plates in the illustrated magazines for flower lovers of the time, such as the *Botanical Magazine* and *Botanical Register*.

And in what warm climates do fuchsias grow "wild"? There are a few in New Zealand; otherwise they are found only in warm regions of America, most of the hundred described species occurring in the Andes, nearly half in Peru. In that beautiful land it is a not uncommon experience when one is riding along a road or trail bordered with dense shrubbery to glimpse a flaming splotch of red among the varied greens of the tangled vegetation which upon examination proves to be a fuchsia bush half supported in the mass of neighboring plants.

SPECIES NAMED FOR DR. OSGOOD

Dr. Wilfred Osgood, now Curator Emeritus of Field Museum's Department of Zoology, stopped to admire such a fuchsia in 1912, on one of his expeditions to Peru, and brought it back to Field Museum. Not studied critically until 1940, it then proved to be an undescribed species! Like many of the sorts growing in Peru, it has vermilion flowers of striking beauty. It has now been named fittingly, after the discoverer, *Fuchsia Osgoodii*.

Thus, from the sixteenth century to the present, botanists have been cataloguing plants, but now they are concerned chiefly with their relationship, scientifically determined; the origin of botany as a part of medicine has nearly been forgotten even by the botanist.

Fuchsia as a pot plant is illustrated in Botany Leaflet No. 20, *House Plants*, by Robert Van Tress, published by Field Museum Press, and on sale at The Book Shop of the Museum—35 cents.

THINGS YOU MAY HAVE MISSED

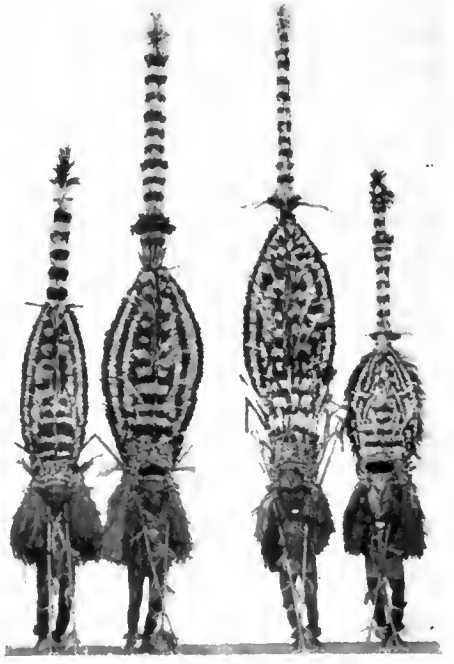
"High Hats" from New Guinea

With Easter coming on the thirteenth of April, spring fashions in bonnets are very much to the fore in the minds of the feminine element of the population. Whether the styles call for high crowns or low, wide brims or narrow, simple and plain trimming or heavy loads of flowers, fruits and feathers, there will, no doubt, be many extremes which as usual will bring forth jibes from husbands, brothers, fathers, and sweethearts.

However, what is probably the world's superlative extreme in head-dress is exhibited at Field Museum in some feathered ceremonial masks from New Guinea ranging from fourteen to nineteen feet in height—a record in high hatting, we feel sure. It should be noted further that these weird creations are worn by native *men*, not women. Like the Easter bonnet, they have a connection with religious ritual—in fact, are much more closely connected to the religion of the Papuans than the Easter hat is to the Easter festival. It is not expected that these masks will have any influence on women's styles in this Windy City, since even the natives of New Guinea find it impossible to wear this lofty head-dress when a breeze is blowing.

The masks, of which the Museum possesses four, are exhibited in two tall cases at the south end of Stanley Field Hall. One of the nineteen-foot masks, and one of those only fourteen feet tall, is used on each occasion of the ceremonial performance, which occurs only once in two or three years. In the Museum exhibit the masks are shown mounted on life-size models of native celebrants as they appear in the rites.

The masks are made inside an enclosure from which the uninitiated are carefully excluded, according to notes of the late Dr. Albert B. Lewis, who as Field Museum's Curator of Melanesian Ethnology conducted an expedition which included collecting and studies in New Guinea. The process of manufacture usually takes six months or longer. When everything is ready, the enclosure is opened at one corner, and the ceremonial procession, headed by musicians and dancers, appears and slowly makes its way through the village. This is repeated morning and evening for several days. Each mask is carried on the head of a man, with the wooden face placed so that he can see through the eye holes. Often the bearer is assisted by a man on each side to help him hold the mask, or he may steady it himself with sticks held in his hands.



Hat-like Masks, 14 to 19 Feet Tall
This Papuan ceremonial paraphernalia, mounted on life-size figures, is on exhibition in Stanley Field Hall.

The masked figures represent local deities, and during the procession many offerings of food are made to them, the food afterwards being consumed. When the whole ceremony is finished, the masks are dismantled, and the bamboo frames destroyed, but the feathers are carefully preserved. The deities are then believed to return to their local abiding places, such as the bottom of a neighboring lagoon or the bed of a stream.

WRESTLING IN AFRICA IS TRULY TOUGH

By WILFRID D. HAMBLY
CURATOR OF AFRICAN ETHNOLOGY

All peoples throughout the world delight in assembling to witness strenuous games in which men are pitted against one another, either individually or in groups.

African Negroes are particularly fond of contests of endurance. One of these is a whipping ceremony which is performed in connection with tests of manhood and the initiation of boys into tribal life. Although all sports are not strenuous, the wrestling matches performed in market places of west Africa are energetic contests which are indulged in only by men of robust physique. A collection is made among the spectators after a few bouts, at the end of which the contestants have usually been so severely tousled that they are covered from head to foot in dust. Meanwhile other sections of the crowd are entertained by a snake charmer, a dwarf, or a man who owns a tame hyena.

When traveling as leader of the Frederick H. Rawson Ethnological Expedition to West Africa, the writer was much interested to find the sport of wrestling still in existence, for such games were reported from west Africa as long ago as 1795 by Mungo Park, a renowned explorer. Park states that he was invited to see an evening wrestling match, which was a common form of public entertainment among the Mandingo tribe. The spectators arranged themselves in a circle, leaving the intermediate space for the wrestlers, "who were strong active young men, full of emulation, and accustomed, I suppose, from their infancy to this sort of exertion.

"Being stripped of their clothing, except a short pair of pants, and having their skin anointed with oil, or butter made from the nuts of the shea-butter tree, the combatants approached each other on all fours, parrying with, and occasionally extending a hand for some time, till at length one of them sprang forward and caught his rival by the knee. Great dexterity and judgment were now displayed, but the contest was decided by superior strength." Park expresses the opinion that few Europeans would have been able to cope with the conqueror. The actions of the contestants "were animated by music of a drum," and to this they made some attempt to adapt their movements.

FEW HOLDS BARRED

Dr. Ralph Linton, leader of the Marshall Field Anthropological Expedition to Madagascar in 1926, photographed a wrestling match among the Bara tribe. Dr. Linton states that the Tanala are also fond of wrestling, but the sport is more important among the Bara and the Sakalava. The wrestling is of the "catch-as-catch-can" variety, and a fall consists of a simultaneous touching of the loser's shoulders on the ground. "The wrestlers display more strength than science, and apparently there are no named grips. Strangling or striking an opponent is considered unfair, but there are no other fouls, and injuries are not uncommon." The account continues to state that the crowd acts as umpire, and the bystanders will separate the contestants if they lose their tempers. The Tanala seem to have a sense of fair play and are usually very good losers.

Some of the Tanala tribe, continued Dr. Linton, practice a mild type of wrestling in which the contestants hug each other around the waist and try to trip each other. In another form of wrestling one man stands with his right arm extended and his elbow bent, his clenched fist being held in front of his face. His opponent seizes his wrist with both hands and tries to throw the man off his balance. If a man moves his feet he is judged to have lost the bout.

COMBATS ARE REALLY ROUGH

Dr. Linton states that boxing is known among the plateau and the east coast tribes of Madagascar. Blows are delivered with a wide swing, and not from the shoulders as among Europeans. The blows arrive with great force, and the bones of a man's forearm are sometimes broken in an attempt to ward off an attack.

Everyone is familiar with the brutal old Roman method of boxing with the use of metal gloves, and even at the present day spectators who appear to enjoy the groans of wrestlers caught in a "toe hold" or a "scissors grip" are numbered by thousands at big matches. But, without a doubt, certain Negro tribes of Africa have invented, and today use the most gruesome type of wrestling. This is accompanied by the use of iron bracelets provided with a cutting edge or with spikes. Evidently the use of wristlets is ancient, since the weapons have been dug up from African sites of antiquity.

Among the Maguzawa tribe of Nigeria wristlet wrestling is indulged in by boys who have to prove their eligibility for the status of manhood. A wristlet may be worn on one hand only, or one on each hand. The arms are swathed in leather strips.

A personal observer of this type of fighting has reported that the men clasp one another round the waist, and that head blows are given. An average knock-out blow confines a man to bed for a month, while a bad blow can lay a man out for three months or even kill him. The bout is accompanied by drumming. The Kyangawa tribe have a form of boxing with knives, a knife bound to one arm and a shield to another. Padded bags are worn around the waist, and the observer states that as a rule the wounds are not serious, and the fight is over as soon as blood is drawn. Nevertheless, the lopping off of an opponent's nose is not rare.

NOTABLE GEOLOGICAL SPECIMENS RECEIVED AS A GIFT

Mrs. John Stuart Coonley, of Chicago, has presented to Field Museum a valuable collection of geological specimens. Seldom has a collection of such uniformly choice specimens been received. Included was a fine polished section of a fossil nautilus which has been added to the paleontological collections. An attractive polished specimen of dendritic marble was a welcome addition to the physical geology collections. The mineral collections profited by the acquisition of a fine group of azurite crystals and two specimens of chalcedony geodes.

The remaining thirty-five specimens included in Mrs. Coonley's contribution were all of semi-precious minerals and were specimens of high quality. They have been incorporated in the collections being prepared for installation in H. N. Higinbotham Hall (Hall 31) which is currently undergoing thorough revision. Especially noteworthy among them are a large specimen of amber and a beautiful polished cylinder of rutilated quartz.

Ornithological Expedition Leaving for the West

An ornithological expedition to southern Texas, Arizona, New Mexico, and Colorado, to collect material for proposed new exhibits, will be dispatched by Field Museum about April 1. Mr. Emmet R. Blake, Assistant Curator of Birds, and Mr. Melvin A. Traylor, Jr., Associate in Ornithology, will conduct the expedition. They will travel in the latter's car, and camp in many collecting regions. Collections of reptiles and small mammals will also be made. The expedition, after working in localities ranging from the plains of the deep southwest to the high Rocky Mountains, is expected to return to Chicago late in July.

NEW READING ROOM SERVES PUBLIC IN MUSEUM LIBRARY

The Library of Field Museum has a new reading room, more conveniently located than the old one, with improved lighting, more efficient arrangement, and other facilities adding to its usefulness and to the comfort of readers.

The change has been accomplished by reconstructing and refurnishing the former stack room as a reading room, and moving the book stacks into the former reading room. During the months this work has been in progress, there has been no interruption to the Library's services to scientists and to the public in general.

The New Reading Room of Field Museum's Library

The new reading room is more easily reached by visitors arriving at the third floor on the passenger elevator, the entrance being close to the elevator landing. More effective and agreeable lighting for readers has been provided by installation of an entirely new system of fluorescent illumination from coves around a new lowered ceiling. New service counters, new office space for the librarians, and a new rubber tile floor all help to make the new reading room attractive and quiet, and add to the efficiency of the service provided by the Library personnel.

Revision of the arrangement of the Library's rooms has provided opportunity also to replace the wooden book stacks with modern steel ones, grained and stained like mahogany. The finding of books and pamphlets demanded by readers has been facilitated by installation of fluorescent lights in the stack room as well as in the reading room. Although all work in the stack room has not been completed, as some of it had to wait until transfer of reading facilities to the new room was accomplished, work is now progressing rapidly and, as in the work already finished, without any interruption of service to the public.

For those unacquainted with its facilities, it may be well to call attention to the fact that the Library of Field Museum, which now contains approximately 121,000 books and pamphlets on anthropology, botany, geology, zoology and related subjects, offers the largest reference collection in its special fields in Chicago. It is particularly rich in anthropological and ornithological works, with collections that rank among the foremost in the world. Invaluable for research are the extensive series on its shelves of the proceedings, transactions and publications of learned societies, academies, and universities all over the world.

Strictly a reference library, the reading room is maintained to make the Library's resources available for the use of scientists, students, teachers, and others engaged in research work. These facilities are extended, on application, to laymen with problems requiring reference to the works in a scientific library. Amateur naturalists, and persons with hobbies involving the natural sciences, will find much of value in the Museum Library.

The Library is open weekdays from 9 A.M. to 4 P.M., except Saturdays, when it closes at noon; it is closed all day on Sundays and holidays.

Why Are Mummies?

Why are mummies? Because persistence of the personality after death was the chief tenet of the religion of the ancient Egyptians. Most of our knowledge of their daily life, as will be revealed by a visit to the Egyptian collections in Hall J, we owe to the efforts they made to provide for their welfare after death.

A collection of iron ores, together with models of three types of smelting furnaces, is on exhibition in Frederick J. V. Skiff Hall.

PREHISTORIC ELEPHANT TUSK

By HENRY FIELD
CURATOR OF PHYSICAL ANTHROPOLOGY

In western Europe during the Second Interglacial period the climate appears to have been considerably warmer than at the present time. Contemporary sands and gravels of ancient river beds of England, France, and Germany have yielded bones, teeth and tusks. Remains of the straight-tusked elephant, the rhinoceros, and the African lion and hyena, indicate geographical connections with North Africa during this period. Among other animals which roamed northern Europe were several species of deer, including the Irish elk, wild cattle, and horses.

Some 250,000 years ago Chellean Man wandered over northern Europe. At the entrance to the Hall of the Stone Age of the Old World (Hall C) stands a vivid reconstruction of a Chellean scene beside the banks of the Somme River in northern France. Three large straight-tusked elephants are depicted on the background of the diorama. In an adjoining case is exhibited the right tusk of a large elephant of this type (*Hesperoloxodon antiquus germanicus*) excavated by Dr. E. Fraas from interglacial river-sands at Steinheim, on the river Murr, in Württemberg, Germany. This tusk, which measures 9 feet 4 inches along the inner curve, with a maximum diameter of 18 inches, is one of the finest specimens in existence and was purchased in 1930 from Dr. F. Krantz, at Bonn. It has been estimated that a large bull must have stood about 13 feet 4 inches at the shoulder—a height at least 18 inches greater than the largest recorded modern African elephant. The maximum circumference of both the prehistoric tusk and that of the longest African elephant recorded are approximately the same. The tusk of the modern elephant measured 2 feet 2 inches longer than that of the specimen of *Hesperoloxodon*. This is not an adequate comparison of lengths because part of the fossilized tusk, which was at least 1 foot 6 inches longer during life, is missing. As the prehistoric tusk is now fossilized ivory, no weight can be assigned, but the tusk of the largest African elephant weighs 236 pounds with a measurement along the inner curve of 9 feet and a maximum circumference of 2 feet 2½ inches.

The Chellean hunters, armed with clubs or axes, must have lived in constant dread of these great brutes as they trumpeted and charged through the forests.

A large specimen of lodestone, weighing about 400 pounds, and possessing unusual magnetic power, is on exhibition in Clarence Buckingham Hall (Hall 35). To prove its magnetism, a number of metallic objects have been placed with it, and are held clinging to it only by its attraction.

Field Museum of Natural History
FOUNDED BY MARSHALL FIELD, 1893
Roosevelt Road and Field Drive, Chicago
TELEPHONE: WABASH 9410

FIELD MUSEUM NEWS

EDITOR
CLIFFORD C. GREGG ..... *Director of the Museum*

ASSOCIATE EDITOR
WILFRED H. OSGOOD ..... *Curator Emeritus, Zoology*

CONTRIBUTING EDITORS
PAUL S. MARTIN ..... *Chief Curator of Anthropology*
B. E. DAHLGREN ..... *Chief Curator of Botany*
HENRY W. NICHOLS ..... *Chief Curator of Geology*
KARL P. SCHMIDT ..... *Chief Curator of Zoology*

MANAGING EDITOR
H. B. HARTE ..... *Public Relations Counsel*

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

LIVING "STRUCTURAL ANCESTORS" OF EXTINCT ANIMALS

The fact that a living animal can be regarded as *ancestral* to a creature which has been extinct for millions of years, was the cause of an error in the March issue of FIELD MUSEUM NEWS, and may be of interest to laymen subject to occasional confusion from twists in some of the esoteric language of scientists.

When the copy for the article on the giant fossil bird *Mesembriornis* (published last month on pages 1 and 2) reached the editorial desk, it contained the following sentence:

"Cariama [a modern relative], with its marked tendency toward ground-dwelling habits, its insectivorous-carnivorous diet, and its weak powers of flight, is an almost ideal structural ancestor for the phororhacoids [the group of fossil birds to which *Mesembriornis* belonged] in which such characters and tendencies were carried to an extreme."

The word "ancestor" was stricken from the copy and "descendant" substituted on the seemingly logical and natural assumption that the living bird could not be the ancestor of the extinct one, any more than a man could be the ancestor of his great grandfather. So, with this "correction," the sentence appeared in print—sixth line from the bottom of the second column on page 2.

The writer, Mr. Bryan Patterson, Assistant Curator of Paleontology, thereupon made it plain that not only had he written "ancestor" but he had meant "ancestor" —"*structural* ancestor," at least—the catch seems to be in the adjective. Following is Mr. Patterson's explanation of how and why such things can be:

"Many living animals are comparatively unmodified descendants of early ancestral stages in the evolution of the group to which they belong. To take but one example, the familiar Virginia opossum differs but little from opossums that some sixty million years ago were contemporary with the giant dinosaur *Tyrannosaurus*. There is good evidence that all marsupials evolved from these early opossums. It follows therefore that the ultimate ancestors of such diverse living forms as the kangaroo, the koala, and the pouched wolf, as well as of the giant extinct *Diprotodon*, were animals very similar to the Virginia opossum. Since the Virginia opossum is essentially similar *structurally* to these *ancestors*, one may quite logically refer to it as a 'structural ancestor' of the various animals just mentioned.

"Thus, the living cariama, as the little modified descendant of a stage in the evolution of the phororhacoids, may with perfect propriety be regarded as a structural ancestor of a group of birds dead two million years or more. This term, with the special meaning explained here, is in rather general use among paleontologists."

Staff Notes

Mr. Henry S. Dybas, a graduate of the Central Y.M.C.A. College, Chicago, where he majored in zoological studies, has been appointed to the staff of Field Museum as Assistant in Entomology.

Miss Anne Harding, the artist responsible for the panel paintings in an exhibit of southwestern archaeology recently installed in Hall 7, has been given an appointment for two years on the staff of the Department of Anthropology. She will execute a series of paintings for new exhibits to be installed in the Hall of North American Archaeology (Hall B).

Dr. Fritz Haas, Curator of Lower Invertebrates, lectured before the zoological department of the University of Chicago on March 31, on the subject "The Death of Animals, and the Fate of Their Remains."

Mrs. Leota G. Thomas attended the national meeting of the Museum–School Relations Committee of the Progressive Education Association, and took part in the discussion on "How to Increase the Effective Use of Museums by the Schools." She made the keynote address advocating direction of future research on the part of the committee to find out how the schools can best prepare for museum visits, and how the museums can do a better job of teaching for the classes that come in. Mrs. Thomas, who is a member of the Raymond Foundation staff, also conducted a conference on organization of local museum–school relations committees in cities lacking them.

Mr. Karl P. Schmidt, Chief Curator of Zoology, recently spoke before the Chicagoland Bird Banding Conference at the Chicago Academy of Sciences on "Attempts to Band Blue-Racers in the Chicago Area."

Many demands have recently been made for outside lectures by Mr. Paul G. Dallwig, the Layman Lecturer of Field Museum. Among recent appearances were one before the Rotary Club on the subject, "Let's Begin to Live"; one before the Chicago Women's Club on "An Expedition in Culture"; and one before the Chicago Bar Association on "My Work for Field Museum and How I Got That Way."

Museum Host to Orientalists

The American Oriental Society, whose annual meetings are to be held in Chicago April 15–17, will have one of its general sessions—that on Wednesday afternoon, April 16—at Field Museum. Other sessions will be held at the Oriental Institute, University of Chicago, and the Art Institute.

The session at Field Museum will end with a tea given by this institution for the members of the society. The American Oriental Society is one of the oldest bodies of scholars in the United States, having been founded in 1842. Its last meeting in Field Museum was in 1938.

A FEW FACTS ABOUT FIELD MUSEUM

Field Museum is open every day of the year (except Christmas and New Year's Day) during the hours indicated below:

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

Free courses of lectures for adults are presented in the James Simpson Theatre on Saturday afternoons (at 2:30 o'clock) in March, April, October, and November.

A Cafeteria serves visitors. Rooms are available also for those bringing their lunches.

Chicago Motor Coach Company No. 26 busses provide direct transportation to the Museum. Service is offered also by Surface Lines, Rapid Transit Lines (the "L"), interurban electric lines, and Illinois Central trains. There is ample free parking space for automobiles at the Museum.

EXHIBIT OF WILD PIGS

By COLIN CAMPBELL SANBORN
CURATOR OF MAMMALS

True pigs of the family Suidae live in Europe, Africa and Asia. A very pig-like mammal, called the peccary, is found in the Americas, so that Australia is the only continent without some representative of this group. While there are about one hundred slightly different pigs and peccaries, there are only a few basic species. Most of these are now on exhibition in two new cases recently installed in Hall 15.

In one case is included the European wild boar, the probable ancestor of our domestic pig. This specimen was presented (before the war began) by the Polish Government. Shown with it are the Philippine and Papuan pigs of which there are more than forty closely related forms distributed through the Philippines and the East Indies. Almost in the midst of these occurs a very unusual

The Babirusa

A most distinguished species of pig found only on Buru, Taliaboe, and Celebes, islands of the East Indies. The male has four remarkably upturned tusks. The name "babirusa" is Malayan, and means "hog-deer."

species, the babirusa, in which the tusks of both jaws grow upward to great lengths, those of the upper jaw growing through the skin in the center of the face. The babirusa is found only in Celebes and two small near-by islands. The original specimen of this odd pig was presented by the Chicago Zoological Society, and was reproduced for exhibition in celluloid-like material by Staff Taxidermist Leon L. Walters, inventor of a special process for making reproductions. For certain types of animals these are more satisfactory than would be mounts of the actual skins.

The other case contains two related African pigs, the red river hog and the Abyssinian bush pig. The red river hog lives in the heavily forested parts of West Africa. In color it is a rich brownish red, very different from the dull blacks and browns of other pigs. The bush pigs live in eastern and southern Africa where they travel in small herds of from ten to twenty individuals. Native gardens often suffer from their nocturnal visits.

The South American peccaries differ from the true pigs in having a more complicated stomach, a dorsal musk gland, and only three toes on each hind foot; also, the tusks of the peccaries' upper jaw do not turn up. They differ further in that they have but one or two young in a litter. The collared peccary ranges north into Texas, but the range of the white-lipped peccary only reaches southern Mexico. Both range south to southern Brazil. The white-lipped peccary will make a brave defense when cornered, but stories of deliberate attacks on men are to be doubted.

The cases were prepared for exhibition by Staff Taxidermist Julius Friesser.

CULT OF THE PIG

In the northern New Hebrides, especially the islands of Ambrym, Malekula, and Santo, the pig occupies an important position in the social and religious ideas of the people. There are many ranks or classes in the social scale, and in order to rise in rank a man must kill a certain number of pigs.

Pigs whose tusks form a complete circle and overlap are of special value and, in fact, on certain occasions, only this kind are regarded as valid evidence of a man's right to a certain station in life. The pigs are killed in connection with special ceremonies or *mankes*, which may extend over months. During a *manke*, each of a number of men may kill numerous pigs, so that the total slain may amount to several hundred. The animals are killed by knocking them in the head with special clubs. Twenty or thirty may be slaughtered in one day, and they are immediately cut up and divided among the villagers and their visitors. Thus it is only natural that every *manke* should become an occasion of special feasting.

The lower jaws of all the pigs killed at any particular *manke* are cleaned and arranged in rows on a sloping platform under a shed. There they are left until the flesh decays, whereupon the individual owners take possession, either hanging the bones in their homes, or using the tusks as arm rings.

Because of the significance attached to tusks which form a complete circle, these have become very valuable, and sometimes sell for the equivalent of more than $200. The value increases with the growth of the tusks. Some have been known to form nearly three complete circles, and natives will not part with these for any price.

To encourage such tusk development, the upper tusks are knocked out of living pigs, and the pigs are then kept tied up near or even in the house, and fed on soft food. A boar is given a separate name for every quarter circle added to the tusk length.

On exhibition in the Melanesian collection in Joseph N. Field Hall (Hall A) are examples of boar's jaws and tusks, the types of clubs used as pig killers, and the special pig rope by which the animals are tied to stakes in or near the house during the period of tusk growth. The rope is fastened on the foreleg just above the hoof.

The pigs are sacrificed at the *mankes* with considerable ceremony, to an accompaniment of ritual dances. In front of a large image of a god, one man usually grasps the pig by the forelegs or ears and lifts its forefeet off the ground, while another man wields the club, striking it on the head or over the eyes. One blow is usually sufficient.

FOUR CHILDREN'S PROGRAMS OFFERED DURING APRIL

The spring series of free motion picture programs for children, presented at Field Museum by the James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures, will continue through April with a program each Saturday morning. There will be two showings of the pictures on each program, one beginning at 10 A.M., and one one at 11. Children from all parts of Chicago and suburbs are invited, and no tickets are required for admission. The Museum is prepared to receive large groups from schools and other organizations, as well as individual children coming alone or accompanied by parents or other adults. Teachers are urged to bring their classes.

The following schedule shows the titles of the films to be presented on each Saturday:

April 5—THE FOREST (*Celebration of Arbor Day*); and a cartoon.

April 12—BALANCING NATURE'S BUDGET (*A story of conservation*).

April 19—SUDAN (*Story of natives in the heart of Africa*).

April 26—A DAY AT BROOKFIELD ZOO; and a cartoon.

Model of Natural Bridge

The famous Natural Bridge of Virginia is represented by an accurate scale model in Clarence Buckingham Hall (Hall 35). Besides being a faithful reproduction of the bridge, with its associated scenery, the model illustrates a number of details of rock structure which occur on too large a scale to be shown by specimens.

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. A post card for this purpose is enclosed with this issue.

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

"THE ROMANCE OF DIAMONDS" IN APRIL SUNDAY LECTURES

During April the subject of the Sunday afternoon lectures presented by Mr. Paul G. Dallwig, the Layman Lecturer at Field Museum, will be "The Romance of Diamonds from Mine to Man." Illustrating his talk with exhibits in the Department of Geology, Mr. Dallwig will tell the story of diamonds from their original "find" through the various stages of mining, sorting, cutting, and polishing. In dramatic form he will tell the story of the discovery of diamonds in Africa, the diamond rush that followed, life among the natives, and an imaginary trip through a diamond mine. He will also tell the fascinating tales of hate, love, greed, and murder, attached to the successive ownership of the diamonds of the world.

To meet the demands for accommodations, the same lecture will be presented on each of the four Sundays of the month (April 6, 13, 20, and 27). Lecture audiences assemble promptly at 2 P.M. Because the number that can be conducted among the exhibits under comfortable circumstances on a lecture of this type is limited, it is necessary to make reservations for all Sunday lectures well in advance. This may be done by mail or telephone (WABash 9410). Children cannot be accommodated. The lectures last until 4:30 P.M. with a half-hour intermission midway. During this interval those who desire to smoke or obtain refreshments may do so in the Cafeteria, where special tables are reserved for the group.

In May Mr. Dallwig's subject will be "The Parade of the Races," illustrated with the sculptures of the Races of Mankind by Malvina Hoffman. Reservations for the May, as well as the April lectures, are currently being taken at the Museum.

APRIL GUIDE-LECTURE TOURS

Conducted tours of exhibits, under the guidance of staff lecturers, are made every afternoon at 2 o'clock except Saturdays, Sundays, and certain holidays. Following is the schedule for April.

Tuesday, April 1—General Tour; Wednesday—Life in the Waters (Miss Elizabeth Best); Thursday—General Tour; Friday—Geography of the Chicago Region (Bert E. Grove).

Week beginning April 7: Monday—Masks and Medicine Men (Miss Elizabeth McM. Hambleton); Tuesday—General Tour; Wednesday—Bird Life in the Chicago Region (Mrs. Leota G. Thomas); Thursday—General Tour; Friday—Caribbean Contributions (Miss Marie B. Pabst).

Week beginning April 14: Monday—Land Mammals and Some of Their Ancestors (Miss Elizabeth Best); Tuesday—General Tour; Wednesday—Geology and Civilization (Bert E. Grove); Thursday—General Tour; Friday—Tales of the Spice Roads (Clarence L. Brown).

Week beginning April 21: Monday—Primitive Man as an Artist (Miss Elizabeth McM. Hambleton); Tuesday—General Tour; Wednesday—Animal Life of Swamp and Shore (Mrs. Leota G. Thomas); Thursday—General Tour; Friday—Fruits (Miss Marie B. Pabst).

Week beginning April 28; Monday—Traveling by Land and by Sea (Miss Elizabeth McM. Hambleton); Tuesday—General Tour; Wednesday—The Story of Evolution (Mr. Clarence L. Brown).

Persons wishing to participate should apply at North Entrance. Tours are free. By pre-arrangement with the Director, special tours are available to parties.

GIFTS TO THE MUSEUM

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

Department of Botany:

From Dr. Harry Hoogstraal, Urbana, Ill. —750 herbarium specimens, Mexico; from Dr. B. E. Dahlgren, Chicago—28 specimens of palm material, Brazil; from Philip W. Wolle, Princess Anne, Md., and Dr. Francis Drouet, Chicago—164 specimens of algae and mosses, Maryland; from Dr. Francis Drouet, Chicago—205 specimens of cryptogams, Massachusetts; from University of California, Berkeley, Cal.—55 specimens of myxophyceae; from Dr. V. W. Lindauer, Kerikeri, Bay of Islands, New Zealand—14 specimens of algae, New Zealand; from Donald Richards, Chicago—69 specimens of mosses; from Dr. H. C. Conard, Grinnell, Iowa—30 specimens of hepaticae, Iowa; from Dr. R. H. Woodworth, Bennington, Vt.—274 herbarium specimens, Virgin Islands; from Professor Angel Maldonado, Lima, Peru—36 specimens of cryptogams, Peru; from United States National Museum, Washington, D. C.— 57 specimens of algae.

Department of Geology:

From Mrs. John Stuart Coonley, Chicago —35 minerals and one invertebrate fossil.

Department of Zoology:

From Professor J. Soukup, Puno, Peru—124 insects, Peru; from Lawrence F. Brown, Naples, Fla.—30 lots of tree-snails, south Florida; from Dr. Louis B. Bishop, Pasadena, Cal.—1,180 miscellaneous North American birds; from Chicago Zoological Society, Brookfield, Ill.—8 birds, 2 mammals, and a jumping viper.

The Library:

Valuable books from Carl F. Gronemann, Dr. Henry Field, Rupert Wenzel, and Walter Necker, all of Chicago.

To Collect California Beach Fauna

Dr. Fritz Haas, Curator of Lower Invertebrates, will leave early in April on an expedition to southern California. There he will study the animal life of the beaches, making a survey of the fauna, and collecting specimens, for proposed biological exhibits. The greater part of his work will be done in the vicinity of the Biological Stations of La Jolla and Pacific Grove.

NEW MEMBERS

The following persons became Members of Field Museum during the period from February 17 to March 15:

Associate Members

Clinton B. King, Mrs. Arthur O. Olsen, Dr. Sidney A. Portis.

Annual Members

C. F. Barkell, Leigh B. Block, John W. Bornhoeft, Seward H. Bowers, G. A. Braun, Harlow W. Brown, George Buffington, Gard M. Collins, Junius F. Cook, Jr., C. H. Coyle, Dr. Arthur R. Elliott, George H. Glade, Jr., Richard W. Glade, Melvin M. Goldsmith, Dr. William A. Guild, Dr. Jerome R. Head, Arthur W. Hintze, W. S. Holabird, Jr., Blake C. Hooper, T. Weller Kimball, Raymond R. Knotts, Miss Bess B. Martin, Basil Maxant, C. L. McCreery, Mrs. George McMurray, Robert L. Muckley, R. D. Nash, Ward a Neff, Dr. Louis Novack, W. H. Noyes, Jr., Charles H. Porter, Edward C. Porter, John B. Sharp, Mrs. Joseph J. Slomer, Mrs. Merle E. Sweeley, Leupold Temps, Mrs. John L. Vogel, Bishop Ernest Lynn Waldorf, Wendell Walker.

Cotton and tobacco are two of the South's most important products. The plants which produce them are represented, in full flower, by reproductions on exhibition in Hall 28 of the Department of Botany.

MEMBERSHIP IN FIELD MUSEUM

Field Museum has several classes of Members. Annual Members contribute $10 annually. Associate Members pay $100 and are exempt from dues. Sustaining Members contribute $25 annually for six consecutive years, after which they become Associate Members and are exempt from all further dues. Life Members give $500 and are exempt from dues. Non-Resident Life Members pay $100, and Non-Resident Associate Members $50; both of these classes are also exempt from dues. The Non-Resident memberships are available only to persons residing fifty miles or more from Chicago. Those who give or devise to the Museum $1,000 to $100,000 are designated as Contributors, and those who give or devise $100,000 or more become Benefactors. Other memberships are Honorary, Patron, Corresponding and Corporate, 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.

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 for federal income tax purposes.

Endowments may be made to the Museum with the provision that an annuity be paid to the patron for life. These annuities are guaranteed against fluctuation in amount, and may reduce federal income taxes.

PRINTED BY FIELD MUSEUM PRESS

Field Museum News

Published Monthly by Field Museum of Natural History, Chicago

Vol. 12 MAY, 1941 No. 5

UNIQUE NEW MUSEUM EXHIBIT PERMITS PUBLIC TO SEE A MUMMY X-RAYED

BY H. B. HARTE
PUBLIC RELATIONS COUNSEL

Harwa is a mummy, now resident at Field Museum. In Egypt some 2,800 years ago he was an agricultural official of importance. He first came to America in 1904, arriving at Field Museum with a number of other mummies. For years he rested in obscurity in a storeroom of the Department of Anthropology because other specimens were considered more suitable for exhibition in the Hall of Egyptian Archaeology (Hall J).

The Mummy Harwa

Today, Harwa has risen to a position as the most prominent, most unique mummy in this or any other museum. He is now the only man in the world, living or dead, who is publicly x-rayed every day—and x-rayed although there is nothing the matter with him (except that he's been dead a long time!). He is installed in a special chamber in Hall J. There visitors may see him first in his external mummy wrappings; then, automatically, a fluoroscopic screen moves in front of him, and an electric current of 125,000 volts activates x-rays which penetrate to his interior and project the image of his ancient skeleton on the screen. Lead glass protects visitors to the exhibit from any harm by the rays.

This unusual exhibit, the roentgenographic and mechanical features of which were devised by the General Electric X-ray Corporation, Chicago, was for two years a feature of General Electric's display illustrating electrical progress at the New York World's Fair (1939–40). It will now be a permanent Chicago attraction. The x-ray and mechanical equipment, especially designed and built for this particular purpose, at a cost of many thousands of dollars, comes to Field Museum as a gift from the General Electric Company, whose engineers and technicians assisted in the work of installing it at the Museum.

When visitors to the Egyptian Hall are few in number, they may themselves operate the exhibit by pushing a button. On days when there are many visitors, the cycle whereby Harwa is shown in his mummy wrappings alternately with the revelation of his skeleton on the fluoroscopic screen will be repeated automatically at 40-second intervals throughout the day.

ANCIENT AND MODERN WORLDS MEET

Visits to the chamber of Harwa provide a mysterious, thrilling, and fascinating experience. One finds himself in contact, on the one hand, with an actual human representative of one of the oldest civilizations of this world, whose mummified form best typifies the one thing the average layman's mind associates with that civilization—its preservation of the dead as a principal element of religion. On the other hand, one is confronted with a complex machine created by scientific genius and the marvelous production methods of modern industry—a machine typical of those used in every hospital and medical research center, and responsible for so much of the advance of medical science and the alleviation of human suffering. In the dimly lighted chamber the visitor observes Harwa in his ancient wrappings. His head, still covered with its dried original skin, is exposed, showing features which may be quite reminiscent of persons the visitor has actually known. The chamber gradually darkens, the screen shifts silently in front of the mummy, then lights up, and there, in life-size, appears the image of Harwa's skeleton. One leaves the chamber with a closer feeling of association with the people of long past ages, as well as with a heightened respect for the achievements of modern science and technology.

This exhibit was viewed by approximately nine million people during the two years of the New York fair. Many millions more will see it at Field Museum in the years to come, and members of the staff of the Department of Anthropology regard it as one of the most notable acquisitions that Department has ever received.

Harwa, in addition to being the first adult-size person to be publicly fluoroscoped, was the first mummy to travel on an airplane, having been transported to New York by air for both of his seasons at the fair. The second time he traveled via San Francisco, due to a General Electric shipping clerk's error, and thence was flown back to New York after a hectic exchange of telegrams between the managements of two expositions, the mayors of three cities, the Director of Field Museum, and General Electric and air express officials. In New York and San Francisco he was taken, as "guest of honor," to a number of banquets held by various organizations who welcomed him probably because he could make no after-dinner speeches. All of this gained for Harwa and Field Museum considerable mention in the press from coast to coast.

The inscriptions on the coffin, which is also in the possession of the Museum, state that the mummy's name was Harwa, and that in life (somewhere between 900 and 700 B.C.) he was the custodian of the "magazine" (or storage houses) on an agricultural estate. Granaries, stores of fruits and vegetables, stocks of wool and other animal products, and wine cellars probably all were in his charge, and there is little doubt that a large corps of subordinates and slaves were subject to his commands. The period is known in Egyptian history as that of the Twenty-second Dynasty.

Harwa's X-ray

For several years, beginning in 1925, Field Museum conducted pioneer work in developing and successfully applying a technique for x-ray photography on mummies (and other kinds of specimens handled by the various Departments of this institution not previously studied in this manner). A full report of the results of these experiments on mummies is contained in *Roentgenologic Studies of Egyptian and Peruvian Mummies*, by Professor Roy L. Moodie, Paleontologist to the Wellcome Historical Museum, London (Field Museum Anthropological Memoirs Series, Vol. III, 1931).

MEDICAL EXAMINER'S REPORT ON THE MUMMY HARWA

BY RICHARD A. MARTIN
CURATOR OF NEAR EASTERN ARCHAEOLOGY

A person's sins of dieting, or other physical neglect and abuse, in addition to causing whispered comments among contemporaries due to the effects upon his appearance and disposition, may find him out again through modern medical science thousands of years after he is dead, and expose him to public scorn as the representative of a dissolute age or race.

In the case of Harwa, the 2,800-year-old Egyptian mummy in Field Museum's new fluoroscopic exhibit in Hall J, a thorough diagnosis of his condition was made by a highly qualified roentgenologist just prior to the mummy's installation at the Museum. Harwa obtained an almost 100 per cent clean bill of health.

For the examination a complete series of x-ray films of all parts of the mummy, from various angles, was made through the courtesy of the University of Chicago's medical department. In the reading of these films, it was found that Harwa's twelfth left rib is missing, opening the question as to whether it may have been removed by the embalmer, or was congenitally absent. Aside from this, no indications of any serious physical shortcomings were observed by the examiner.

Evidences of rheumatism were absent. This is unusual among adult Egyptians, as their daily life was so intimately bound up with the River Nile. Irrigation, fishing, and boating all called for frequent contact with the water, and contrary to the general impression the climate of Egypt is often disagreeably cold. There is a possible indication that Harwa may have had an abscess in one tooth. The average Egyptian had excellent teeth, dental trouble being largely confined to the upper classes with their pampered diets. The x-ray examination confirms the conclusions of archaeologists that the mummy is that of a male, and that Harwa was between 25 and 40 years of age at the time of his death.

The study by a roentgenologist, and the exhibit of Harwa at Field Museum, both using the most modern of medical aids, make a link with the beginnings of medical science. Doctors were a recognized part of the ancient civilizations of the Near East. By 2000 B.C. surgical practices were covered by law. A section of the Code of Hammurabi, King of Babylon, states: "If a physician make a deep incision upon a man [perform a major operation] with his bronze lancet and save the man's life; or if he operate on the eye socket of a man and save that man's eye, he shall receive ten shekels of silver." However, the law continues, if the operation were unsuccessful and the patient should die or lose his eye, the physician's hand would be cut off. Rates varied with the social scale, just as some physicians today base their charge on the patient's ability to pay. The common man was charged only five shekels for a ten-shekel treatment, and the slave but two shekels.

From Egypt, at about the same period, come surgical texts dealing with examination, diagnosis, and treatment. Splints were employed for broken bones, and in severe cases the patient's body was immobilized in the correct position by casts of mud. The custom of mummification provided aids for the skill of the surgeon. The embalmers' fine linen wrappings made excellent roller bandages, and wounds were drawn together with adhesive tape. The use of stitching to close large incisions was used on the dead, and may have been employed on the living. Later, in the third century B.C., a great medical school developed in Alexandria. From this Egyptian school came two great Greek physicians: Herophilos, father of anatomy, and Erasistratos, father of physiology.

IRISH POTATOES ARE NOT IRISH

The Irish potato is not only not Irish, but is not the plant to which the name "potato" was first applied. Furthermore, although it is an American vegetable due to its South American origin, it reached North America only by a circuitous route, being carried here by Scotch-Irish immigrants in 1719, after it had been grown commonly in Ireland for about fifty years.

The word "potato" is derived from *batata*, indigenous American name for the sweet potato, a member of the morning glory family. The Irish potato is a member of the nightshade family. This latter includes other common edible plants—the tomato and eggplant—and is known also for tobacco, and for several deadly poisonous species of plants such as belladonna and bittersweet. These latter were used in the practices of sorcery and witchcraft a few centuries ago. Because of the so-called Irish potato's relationship to them, there long existed in Europe a strong prejudice and fear which acted against its use as a food. The word *batata* is still applied to sweet potatoes in the Latin-American countries.

At the present time it is generally accepted that the earliest known source of the Irish potato was Chiloe, an island off the coast of Chile. The Spaniards carried it to Europe, about 1580. Numerous relatives of our cultivated potato are cultivated also in the Andes, and many others grow wild.

The potato was perhaps the greatest gift of the New World to the Old. It has been estimated that the value of one year's potato crop of the whole world is greater than that of all the gold and silver taken to Spain from Mexico and Peru.

FOUR SUNDAY LECTURES IN MAY ON "PARADE OF THE RACES"

With the presentation in May of "The Parade of the Races," which has proved to be one of his most popular subjects, Mr. Paul G. Dallwig, the Layman Lecturer of Field Museum, will close his current season of Sunday afternoon lectures. This subject will be presented on each of the four Sundays of the month (May 4, 11, 18, and 25).

Blackfoot Indian by Malvina Hoffman

To illustrate his talk, Mr. Dallwig will conduct his audience among the 101 bronzes of the Living Races of Mankind by Malvina Hoffman, exhibited in Chauncey Keep Memorial Hall. The lecture will outline the basic physical characteristics that differentiate the races of mankind. Into this data Mr. Dallwig will interweave human interest stories which endow the various bronzes with life, and give his audiences a more intimate acquaintance with the customs of various peoples.

Lecture audiences assemble promptly at 2 P.M. Because the number that can be conducted among the exhibits under comfortable circumstances on a lecture of this type is limited, it is necessary to make reservations for all Sunday lectures well in advance. This may be done by mail or telephone (WABash 9410). Children cannot be accommodated. The lectures last until 4:30 P.M. with a half-hour intermission midway. During this interval those who desire to smoke or obtain refreshments may do so in the Cafeteria, where special tables are reserved for the group.

Mr. Dallwig will resume his Sunday afternoon lectures in November. He plans to present some entirely new subjects during the next season of seven months, reservations for which will open in October.

Museum Hours Extended for Summer Period

Summer visiting hours, 9 A.M. to 6 P.M. daily, including Sundays and holidays, will go into effect at Field Museum on May 1, and continue throughout the period up to and including September 1 (Labor Day).

MAY 2 MARKS 20th ANNIVERSARY OF FIELD MUSEUM'S PRESENT BUILDING

Photograph by Henry Fuermann & Sons, Chicago

Since 1921, more than 25,000,000 men, women and children have entered the world of natural science through the portals of this monumental structure. Over 5,800,000 others visited the Museum during some twenty-five years in its old Jackson Park location.

A PERIOD OF GREAT EXPANSION AND CONSTANT IMPROVEMENT

By CLIFFORD C. GREGG
DIRECTOR

May 1 is moving day for thousands of families, and the weeks that follow may mean distraught nerves to many as they undertake the task of rearranging furniture, unpacking boxes of books and barrels of chinaware, and making the other readjustments that are necessary before they can feel "at home" in their new quarters.

Just twenty years ago—on May 2, 1921—Field Museum became "at home" in its present building. With its exhibits reinstalled after a gigantic moving operation, it formally opened its doors to the public on that date. If you think you are confronted with difficulties when you move, just imagine the task the Museum men of that time (some of whom are still on the staff) had in packing, transporting, unpacking and reinstalling the hundreds of thousands of items, large and small, included in one of the world's greatest natural history institutions. Some idea of the magnitude of this task is given in the following excerpt from an article by the late Stephen C. Simms, former Director of the Museum (who, at the time of moving, was a Curator):

"Many months were spent on careful packing of the priceless treasures in the collections to guard them against damage in transit from the old building in Jackson Park. Certain exhibition material required drastic treatment to make it ready for moving. The African elephant with trunk elevated, from the group of fighting elephants by Carl E. Akeley (now in Stanley Field Hall) had to have its head removed before it was practicable to transport it. To protect the heavy but fragile bones, the huge skeleton of the dinosaur (*Apatosaurus*) from Fruita, Colorado, had to be completely disarticulated and reassembled after arrival in the new building—a task of proportions comparable to the original mounting of the skeleton. Other large skeletons required similar treatment.

DAMAGE IN MOVING WAS NEGLIGIBLE

"The large model of the moon (19 feet in diameter) had to be separated into 116 sections, and reassembled at the new building in proper order. Some of the exhibits moved numbered thousands of specimens, the identity of each of which had to be preserved, while their arrangement had to be so systematized that they could be reinstalled in the same order. Protection from weather and dust was also essential. . . . Altogether, the moving involved 1,727 standing exhibition cases, 98 disassembled cases, 11,645 boxes, crates, barrels and packages, and 8,006 pieces of office furniture, general equipment, and other objects. Once all the preparations were made, the actual moving was carried out with the utmost dispatch.

"A large part of the transfer was made over the Illinois Central, special spurs of track and loading platforms being built to the doors of both the old and the new buildings. There were 321 freight car loads, and the transfer of material by rail was completed in 34 days. The balance of the material was carried in 354 five-ton truck loads, and moving was completed in 132 days. So carefully had the preparations been made that out of the hundreds of thousands of specimens not a single one was lost or misplaced, and the damage suffered was negligible. With material worth many millions of dollars moved, the repairs for material damaged, including the replacing of broken glass in exhibition cases, amounted to only slightly over $4,000. The amount of glass alone

One of Strange Sights When Field Museum Moved in 1921

A large part of the institution's exhibition material was transported by rail from the old building in Jackson Park to the present structure, the operation being facilitated by construction of track spurs and platforms at the doors of both buildings. The head of one mounted elephant was removed for safe handling and clearance of obstructions.

which was moved was valued (at the 1921 prices) at more than $750,000."

ADVANCES MADE IN TWENTY YEARS

Within the twenty years of occupancy of this building, advances and improvements have been so rapid, and so constant, that today the Museum is scarcely recognizable as the same institution.

Many of the exhibits which were available on that opening day have either been changed and improved, or replaced with better material, while the additions of new material have perhaps doubled both the exhibits and the research collections. When this building was first occupied, a number of the halls were vacant, waiting for material still to be obtained; now, not only are all the areas originally planned for use as exhibition halls occupied, but many other areas have been reconstructed and converted into additional exhibition halls.

On opening day in 1921, and in the more than twenty-five previous years during which the Museum was in Jackson Park, there were no habitat groups of animals complete with scenic backgrounds and foregrounds, in built-in cases architecturally merged with the building structure. Today hall after hall presents extensive series of exhibits of this type, which have much more interest, and which are more harmonious with their surroundings than the old style exhibits. The habitat group or diorama technique has been extended so that it is now used in presenting anthropological, botanical, geological and paleontological subjects as well as zoological groups.

Great improvements have been made in the labeling of exhibits, both as to the information presented, and in the legibility of the labels. Year after year there have been improvements in lighting, giving more natural and pleasing effects in illuminating exhibits. Only in the last few years an important further step in this direction has been achieved by the application of the latest type of fluorescent lighting to a number of entire halls as well as to various individual exhibits.

EDUCATIONAL ACTIVITIES INCREASED

Other Museum activities have kept pace during these twenty years with the developments in exhibition techniques. The educational work of such units of the Museum organization as the N. W. Harris Public School Extension and the James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures (the latter established since the occupancy of this building through the generosity of Mrs. James Nelson Raymond) has grown in scope, importance, and in numbers of school children and teachers reached year by year. Today there is scarcely a school child in Chicago who does not receive direct benefits from the Museum through these agencies.

Twenty years have seen an amazing growth in the collections of the Library which now ranks among the finest specializing in natural sciences. The scientific and other publications of the Museum have developed to noteworthy proportions. Consequently the facilities of the Division of Printing have grown from a one-man job shop with a "kicker" press to a really large and excellent modern printing plant with presses of various types, mechanical typesetting equipment, folding machines, bindery machines, collotype studio and press for illustrations, and everything else needed for the production of books which often run to several hundred pages each.

The study collections, which are reserved for serious research students and others who require access to reference material to solve specific problems, have grown perhaps even more amazingly than the exhibits.

What has happened in twenty years I have not covered, nor could I attempt to cover, in the space available here. The important thing is that the Museum has kept vigorously alive and constantly growing. The move to a new location and building was only one of many forward steps that had to be taken to provide for its continuing growth and expansion.

Museum Techniques Demonstrated at Rotary Exposition

Field Museum participated in the annual Rotary Club Exposition, held April 22 to April 25 at the Hotel Sherman. This was the second year the Museum occupied a booth at the exposition.

In recognition of the great public interest in techniques and behind-the-scene activities, two demonstrations of museum procedures constituted the essential part of Field Museum's display. Mr. W. E. Eigsti, Staff Taxidermist, mounted specimens for a small mammal exhibit soon to be installed in Hall 15. Mr. James H. Quinn, Chief Preparator, Division of Paleontology, prepared several specimens of typotheres, which are small fossil ungulates from South America. The exhibit arrested the attention of many visitors.

Extensive Bird Exhibits

Nearly all known species of American birds are included in the systematic exhibits in Hall 21. In the foreign section, birds have been selected to show the principal types from the standpoint of classification, distribution, and general interest.

CHICAGO AREA SPRING FLOWERS BLOOM EARLY THIS YEAR

By JULIAN A. STEYERMARK
ASSISTANT CURATOR OF THE HERBARIUM

The unusually warm weather of mid-April forced open the buds of several kinds of flowers which in the Chicago area ordinarily do not commence to open until late April or early May. On Easter Sunday (April 13) as many as sixteen different species of plants native to Illinois were actually in flower, and several other kinds were already beginning to show flower-buds.

Those in flower included (among the trees and shrubs): alder, hazelnut, hop hornbeam, red maple, silver maple, American elm, trembling aspen, cottonwood, and two species of willow. The herbaceous group in flower included skunk cabbage, hepatica (*Hepatica americana*), rue anemone, spring beauty, purple cress (*Cardamine Douglasii*), rock cress (*Arabis lyrata*), and whitlow grass (*Draba verna*). Five of the seven members of the herbaceous group in bloom belong to the mustard and buttercup families, which are two of the predominant families in the early spring flora.

Besides these, many other kinds of plants were conspicuous by their patches of green shoots. Clumps of Virginia cowslip or bluebell (*Mertensia*) and marsh marigold leaves ornamented marshy or wet ground, while in the low woods adjacent to the streams appeared green shoots of wild ginger, wild leek (*Allium tricoccum*), wild onion (*Allium canadense*), skunk cabbage leaves beginning to unfold, and young mayapple sprouts. Several other kinds were about to bloom and had good-sized buds; included in this class were wind anemone (*Anemone quinquefolia*), wakerobin (*Trillium sessile*), and trailing arbutus.

This outburst of floral display was all the more spectacular because it came unexpectedly after the previous cool weather. During the first week of April only a few trees and shrubs were in bloom, and skunk cabbage was the only herbaceous plant actually in flower. The few warm days brought just enough heat and sunshine to make the difference between budding and blooming stages.

In addition to these native plants which were flowering, several garden herbs and shrubs were well advanced at Easter time. These included golden-bells or Forsythia, crocus, snowdrops, grape hyacinth, scillas, and daffodils. A week later there were fifty species in flower. At the end of the month a hundred could probably be found.

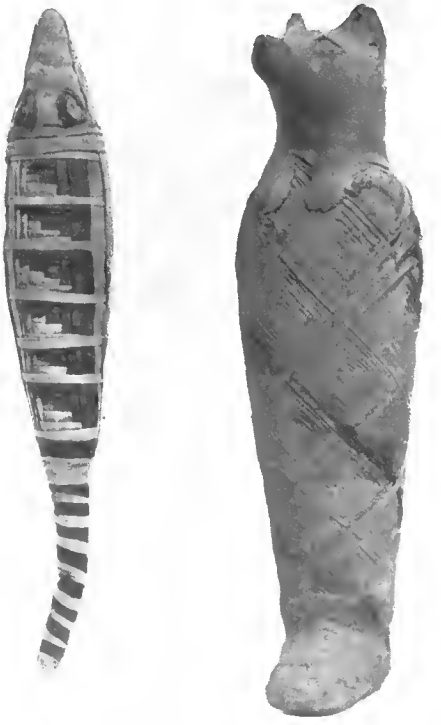
Pan American Lectures

In accordance with the Museum's policy of co-operating where possible with other worthy civic movements, special lecture tours were given in certain of the exhibition halls on Pan American Day, April 14, sponsored by the Pan American Council. Miss Elizabeth McM. Hambleton, of the Raymond Foundation staff, lectured on "Story of the People of Latin America," emphasizing facts about early Indian civilizations as well as the present-day Indian population. Mr. Clarence L. Brown lectured on "Commercial Products of Latin America," stressing the economic reasons for relationships between the United States and its western hemisphere neighbors.

THINGS YOU MAY HAVE MISSED

Animal Mummies

With the mummy Harwa and his daily x-ray especially featured in this issue of FIELD MUSEUM NEWS, it is appropriate to point out that Field Museum has a representative collection of animal and bird mummies, as well as human mummies, from ancient Egypt. Also, it may be noted that much has been learned about these animal mummies from pioneer x-ray studies conducted at this institution some years ago.



Pets? or Religious Symbols?
Mummified lizard, and cat, from Egypt. The wrappings of the former suggest a young crocodile, but x-ray examination does not justify such identification. Most mummified animals are believed to have been associated with deities, but some may have been pets, and some may have been intended as food for the dead.

Animal mummies and their coffins, mostly from the Twenty-fifth Dynasty to the Roman Period (7th Century B.C.—First Century A.D.) are displayed in Case 8 in the Hall of Egyptian Archaeology (Hall J), and bird mummies, mostly of the Greek or Roman Period (from about the 4th Century B.C. to the First Century A.D.) are exemplified by various species, in Case 6.

Archaeologists suggest three possible reasons for the preservation of the bodies of animals and birds by Egyptians. In royal tombs in the Eighteenth Dynasty (15th–14th Centuries B.C.) there have been found desiccated birds and animals, or even parts of animals, which all evidence indicates were intended as food offerings for the human occupants of the tombs in their after life. A second possible reason in some cases is a sentimental one—some of the animals are believed to have been household pets, and therefore were mummified and laid away with their masters or mistresses to continue companionship in the hereafter as on this earth. The third and usual reason, however, for the preservation of animal mummies is that numerous species had acquired sanctity by association in certain localities with various Egyptian deities. Horus, for example, is often pictured in falcon form; Nekhbet of el-Kab is a vulture-goddess; and Amon of Thebes sometimes appears as a goose. All of the bird mummies at Field Museum (but not all those of mammals) apparently owe their existence to their religious significance. Such animals were duly embalmed and laid away en masse in cemeteries of their own or in chambers of their temples. Birds of prey have been found especially at Gizeh, Roda, and Kom Ombo. Those at Kom Ombo were buried apparently in Roman times, in trenches and pits in the sandy area behind the temple.

Strange to say, x-ray examination has revealed among these sacred animals traces of even more chicanery than has been noted in the human mummies. Some of the animal skeletons lack the head or other parts; one gazelle mummy contains no bones except the horns; and some of the "cats" are merely shaped packages of linen without a trace of the actual animal.

Coffins for these mummies were often shaped like the animals themselves, just as anthropoid coffins were made for human beings. In other instances, the creature was represented on the lid. Little cobras, lizards, eels, or shrews, in their tiny coffins of wood or bronze, seem to have had amuletic value to the ancient Egyptians and to have been carried or kept as charms.

Included in the Museum collection are mummies of two vultures, a goose, numerous small hawks, a number of cats, a gazelle, an ape, a number of shrews, and what is believed to be some sort of lizard. Also displayed are some fabricated imitations of animals, and coffins designed for the mummies of apes, shrews, cobras, and eels.

How many kinds of products come from petroleum? If you can think of only five or six, visit the extensive exhibit of petroleum products in Hall 36 of the Department of Geology. The number of things you didn't know, or at least didn't think of, will probably surprise you.

Field Museum of Natural History
FOUNDED BY MARSHALL FIELD, 1893
Roosevelt Road and Field Drive, Chicago
TELEPHONE: WABASH 9410

FIELD MUSEUM NEWS

EDITOR
CLIFFORD C. GREGG.....*Director of the Museum*
ASSOCIATE EDITOR
WILFRED H. OSGOOD.....*Curator Emeritus, Zoology*
CONTRIBUTING EDITORS
PAUL S. MARTIN.....*Chief Curator of Anthropology*
B. E. DAHLGREN.....*Chief Curator of Botany*
HENRY W. NICHOLS.....*Chief Curator of Geology*
KARL P. SCHMIDT.....*Chief Curator of Zoology*
MANAGING EDITOR
H. B. HARTE.....*Public Relations Counsel*

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

CHICAGO MUSEUMS AND SCHOOLS MEET IN CONFERENCE

Museum and school officials considered general problems relating to the educational use of Chicago's museums at an all-day conference held April 19 at the Museum of Science and Industry. The meeting was sponsored by the Chicago Museum-School Relations Committee, a voluntary organization composed of representatives of the several museums and principal school systems of the city and adjacent areas.

The highlight of the program was a symposium on the theme, "How can museums and schools co-operate toward a greater educational effectiveness?" Participating were eleven directors and other representatives of Chicago museums, and administrative heads of the principal school systems. Among members of Field Museum's staff who took part were Major Clifford C. Gregg, Director; Mr. John R. Millar, Curator of the N. W. Harris Public School Extension; Miss Miriam Wood, Chief of the James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures; Mrs. Leota G. Thomas and Miss Elizabeth McM. Hambleton, of the Raymond Foundation staff. Mrs. Thomas is the chairman of the local committee.

The first public offering of *A Guide for the Educational Use of Museums of the Chicago Area* was made at the conference. This eighty-four page booklet, the work of the Committee, contains a directory of museums, their services, and other pertinent information. In addition the guide lists the materials and exhibits of the various institutions grouped under eleven standard units of study (such as plant life, primitive peoples, and industry) to form a ready reference for teachers in planning class use of museum facilities. The publication was enthusiastically received by school people. It has now been placed on sale at The Book Shop of Field Museum. —J.R.M.

PICTORIAL SURVEY OF IRAQ

BY HENRY FIELD
CURATOR OF PHYSICAL ANTHROPOLOGY

The Field Museum-Oxford University Joint Expedition to Kish excavated sections of that ancient city from 1922 to 1933. Several hundred negatives and a few reels of standard motion picture film now constitute the entire pictorial record of the Kish cultural strata. During the anthropometric survey of the modern inhabitants of Iraq (a survey begun by the writer and the late Dr. L. H. Dudley Buxton during the winter season of 1925–1926 and continued in 1927, 1928 and 1934), front and profile photographs were taken of each individual measured and observed.

During 1934, Mr. Richard A. Martin, now Curator of Near Eastern Archaeology, accompanied the Marshall Field Anthropological Expedition to the Near East as photographer. In addition to racial type photographs, Mr. Martin took several thousand negatives of the land and the people.

Last year the Museum acquired by gift from the Estate of Mrs. A. L. Fisher, of Colorado Springs, 1,200 negatives recording many phases of human activity in Iraq. Mrs. Fisher, a personal friend of Faisal, first King of Iraq, undertook privately to prepare a pictorial record of this kingdom to which she gave the name "Your Beautiful Iraq." After two years of effort, and at no small personal expense, Mrs. Fisher held an exhibition at Baghdad in 1929. Shortly thereafter Mrs. Fisher returned to the United States where, on account of failing health, she took up an enforced residence at Colorado Springs. Upon her death in 1939 the executors followed instructions by presenting to the Museum this unique collection of negatives of Iraq. A complete set of prints has been mounted in five albums in the Department of Anthropology.

As a result of the combined efforts of the staff, supplemented by the generosity of Mrs. Fisher, the Museum thus possesses an exceptionally good series of photographs illustrating life in Iraq.

U. S. Vice-President Visits Museum

The Hon. Henry A. Wallace, Vice-President of the United States, visited Field Museum on March 31 as the guest of Mrs. Edna Horn Mandel, former Associate on the staff in the Division of Chinese Archaeology and Ethnology. He was entertained by Mr. Stanley Field, President of the Museum, and Dr. Paul S. Martin, Chief Curator of Anthropology.

Staff Notes

Mr. Karl P. Schmidt, Chief Curator of Zoology, and his son John, left April 12 on a brief field trip to Arkansas and Texas. They plan to meet Mr. C. M. Barber, formerly affiliated with Field Museum, who will collect with them in Texas. Mr. Schmidt will read a paper before the Texas Herpetological Society at Sealy.

Mrs. Emily M. Wilcoxson, Librarian, Mrs. Mary W. Baker, Associate Librarian, and Mrs. Eunice Gemmill, Assistant Librarian, were hostesses on April 4 to the Museum staff at a tea in dedication of the new reading room of the Library. Miss Elsie Lippincott, former Librarian who retired several years ago, was a guest. Mrs. Elsie H. Thomas, Recorder, and Miss Miriam Wood, Chief of the Raymond Foundation, poured.

Dr. Paul S. Martin, Chief Curator of Anthropology, lectured at the University of Michigan, March 27, on "Archaeology of the Southwest."

Dr. Julian A. Steyermark, Assistant Curator of the Herbarium, recently addressed the Midwest Horticultural Society on "The Plant Life of Guatemala."

A FEW FACTS ABOUT FIELD MUSEUM

Field Museum is open every day of the year (except Christmas and New Year's Day) during the hours indicated below:

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

Free courses of lectures for adults are presented in the James Simpson Theatre on Saturday afternoons (at 2:30 o'clock) in March, April, October, and November.

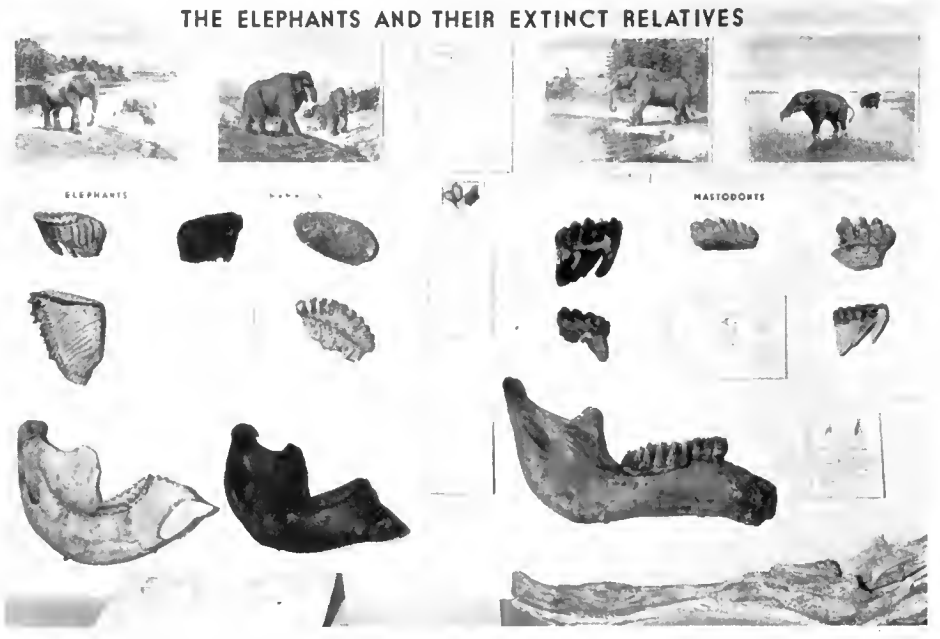
A Cafeteria serves visitors. Rooms are available also for those bringing their lunches.

Chicago Motor Coach Company No. 26 busses provide direct transportation to the Museum. Service is offered also by Surface Lines, Rapid Transit Lines (the "L"), interurban electric lines, and Illinois Central trains. There is ample free parking space for automobiles at the Museum.

HISTORY OF ELEPHANT ORDER TRACED IN FOSSIL EXHIBIT

By BRYAN PATTERSON
ASSISTANT CURATOR OF PALEONTOLOGY

Few animals are as impressive in appearance, as interesting in habits, or as surprisingly intelligent as the elephants. Although well known to most persons through their frequent appearance in zoos and circuses, they are sufficiently spectacular to prevent their being regarded with the indifference which usually accompanies familiarity. The wonderfully adaptable trunk, the hallmark of the group, which can be used for such a variety of purposes as the delicate manipulation of a peanut, the taking of a showerbath, or the lifting of a tree trunk, is alone sufficient to insure elephants a prominent place among the wonders of the animal kingdom.



New Synoptic Type of Exhibit in Paleontology

Some of the principal facts about elephants and their fossil relatives are illustrated by comparisons of bones, by paintings restoring the appearance of prehistoric types, and by maps indicating present and past distribution.

Interest in the living elephants is considerably enhanced by the realization that the two forms now confined to Africa and southeastern Asia constitute a small remnant of a once extensive order whose range included most of the earth and whose known history goes back more than thirty million years. The earliest proboscideans, as members of the elephant order are called, occurred in the late Eocene of Egypt. Of tapir size and rather tapir-like in appearance, they possessed many of the basic characters of the order and indicate that a considerable part of proboscidean evolution had taken place before this first appearance of the group in the geologic record. The complete absence of proboscideans in deposits of an earlier date than late Eocene in other continents definitely suggests that Africa was the ancestral home of the order. During the later part of the Age of Mammals the proboscideans spread over the earth until, by the Pleistocene or Glacial epoch, they had invaded every continent with the exception of Australia. The common occurrence of bones and teeth of mastodons and mammoths in nearby bog deposits and gravel pits shows that these animals were numerous in the Chicago area and that they lived here until comparatively recent times, geologically speaking. Specimens of the American Mastodon are the commonest fossil vertebrates that are brought in to the Museum for determination.

FAMILIES COMPARED IN EXHIBIT

The elephant and mastodont families are the two most important of the order, and include the majority of the extinct forms. A new exhibit which has recently been added to Ernest R. Graham Hall (Hall 38) is devoted to these two groups. It displays specimens of typical representatives of both, compares and contrasts them, demonstrates the present and past distribution by means of maps, and includes paintings of four of the better known or more interesting forms. One fact that is emphasized is the close relationship between mammoths and elephants. It is probable that most persons who have heard of mammoths and mastodonts tend to think of them as practically one and the same thing, whereas in reality they were quite distinct.

Of these two families, the mastodonts are the older and more diversified. The earliest known representatives, found in the Oligocene of Egypt, had already attained the typical proboscidean body form, but had long heads and tusks in the lower jaw. A considerable variety of types evolved from these forms, the most extraordinary of which were the so-called shovel-jawed mastodonts. In these animals the lower jaw, one of which is shown in the exhibit, came to bear an astonishing similarity to a scoop shovel. The lower tusks became broad and flat with a chisel edge in front, and the connecting portion, or simphysis, of the two mandibles became greatly elongated and concave above. The resemblance to a shovel was no freak of nature but a marvelous adaptation in response to the requirements of a specialized mode of life. Study of the skeletons of these animals and of the deposits in which their bones have been found shows that they frequented marshes and used their "shovels" for digging up succulent aquatic plants from the mud.

EVOLUTION OF THE TRUNK

A short head was evolved in several different lines of mastodonts. Since these animals possessed the typical elephant body structure with the characteristic short neck and long, pillar-like legs, the obvious result of a shortening of the skull and jaw was to remove the mouth from contact with the ground. The necessity for overcoming this difficulty led to the development of the trunk, which is actually the highly modified nose and upper lip. It is altogether likely that in the long-headed ancestral mastodonts nose and lip formed a well developed flexible snout, somewhat resembling a tapir's, and that elongation of this organ kept pace with the shortening of the head.

By late Miocene time the mastodonts had spread to Europe, Asia and, via a land connection at the site of the present Bering Strait, North America. Elevation of the Isthmus of Panama during the Pliocene epoch opened the way to South America, over which they ranged in the Pleistocene. The family survived into early Recent time in the Americas, but died out somewhat earlier in the Old World.

Elephants and mammoths differ from mastodonts chiefly in having higher and shorter heads and much more complicated grinding teeth. They are believed to have arisen in south-central Asia during the later part of the Age of Mammals. Their ancestry is not yet well understood, but they are probably the descendants of a group of short-headed mastodonts. The family spread over all of Eurasia and Africa and reached North America early in Pleistocene time, but, unlike the mastodonts, did not penetrate South America to any extent.

MAMMOTHS PRESERVED IN FLESH

One member of the group, the Northern Mammoth, is perhaps the best known of all extinct vertebrates. Entire carcasses of this animal have been found in frozen ground in Siberia, the flesh so well preserved that wolves and other carnivores have fed readily upon it. Finds such as this, together with the realistic cave paintings of the animal executed by the Stone Age men of western

Europe, make it possible to reconstruct the appearance of this mammoth almost as well as if living specimens had been available for study. A piece of skin and a wisp of hair found in Alaska are included in the exhibit.

The evolution of the elephant order reached its zenith in Pleistocene time, the epoch in which man began to dominate the world. The men of the Stone Age were a hunting people and there is abundant evidence that mammoths were a favorite object of the chase. Huge refuse heaps of mammoth bones in central Europe, and discoveries of arrow points associated with remains of these animals in North America, testify eloquently to the slaughter that must have gone on. This hunting may have contributed to the extinction of the order over the greater part of its once wide range, an extinction that unfortunately is still progressively continuing.

The elephant exhibit is one of a new series which is intended to replace old style cases throughout Ernest R. Graham Hall. In the new cases, shelving is eliminated, the specimens being attached by bracket mountings to the backs of the cases, thus permitting greater flexibility of arrangement and more pleasing installation. Each is planned and installed as a unit and is devoted to one main concept, in this instance the past history of the elephant order. Such exhibits are more attractive and less confusing than those of the old style in which unrelated specimens were placed together, with a common geological age as the only bond between them.

MAY GUIDE-LECTURE TOURS

Conducted tours of exhibits, under the guidance of staff lecturers, are made every afternoon at 2 o'clock except Saturdays, Sundays, and certain holidays. Following is the schedule for May:

Thursday, May 1—General Tour; Friday—The Importance of Rocks and Minerals (Bert E. Grove).

Week beginning May 5: Monday—Animal Life of Forest and Plain (Mrs. Leota G. Thomas); Tuesday—General Tour; Wednesday—Spring Wild Flowers (Miss Marie B. Pabst); Thursday—General Tour; Friday—Hunters and Hunted (Miss Elizabeth Hambleton).

Week beginning May 12: Monday—The Wild Relatives of Some of the Domesticated Animals (Miss Elizabeth Best); Tuesday—General Tour; Wednesday—The History and Adventure of Life (Bert E. Grove); Thursday—General Tour; Friday—Herders and Their Herds (Miss Elizabeth Hambleton).

Week beginning May 19: Monday—Animal Life of Alpine and Polar Regions (Mrs. Leota G. Thomas); Tuesday—General Tour; Wednesday—Clothing and Shelter from Plants (Miss Marie B. Pabst); Thursday—General Tour; Friday—Farmers and Their Crops (Miss Elizabeth Hambleton).

Week beginning May 26: Monday—Apes and Other Animals of the Forest (Miss Elizabeth Best); Tuesday—General Tour; Wednesday—Roots (Miss Marie B. Pabst); Thursday—General Tour; Friday—Memorial Day holiday, *no tour*.

Persons wishing to participate should apply at North Entrance. Tours are free. By pre-arrangement with the Director, special tours are available to parties.

GIFTS TO THE MUSEUM

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

Department of Anthropology:

From F. G. James, Cleveland, Ohio—a stained glass of Tiffany manufacture, 44″ x 80″, made in New York; from Charles Schmid, Oak Park, Ill.—a deadfall (Eskimo trap), Alaska.

Department of Botany:

From Rutgers College, New Brunswick, N. J.—83 herbarium specimens, Costa Rica; from Wood-Mosaic Company, Inc., Louisville, Ky.—2 specimens of Claro walnut, California; from Dr. John R. Johnston, Chimaltenango, Guatemala—65 herbarium specimens, Guatemala; from Dr. Gregorio Bondar, Bahia, Brazil—9 specimens of palm fruits and wax, Bahia, Brazil; from Dr. Angel Maldonado, Lima, Peru—36 specimens of algae, Peru; from Dr. Herman Kleerekoper, São Paulo, Brazil—19 specimens of algae, Brazil; from Dr. Walter Kiener, Lincoln, Neb.—110 specimens of algae, Colorado.

Department of Geology:

From S. C. Puccetti, Chicago—a quartz-filled chalcedony geode, Illinois; from Edwin C. Galbreath, Ashmore, Ill.—3 specimens of vertebrate fossils, Illinois.

Department of Zoology:

From Chicago Zoological Society, Brookfield, Ill.—7 birds; from Princess Sigismund of Prussia, Barranca, Costa Rica—6 snakes, a gecko, and a bat, Costa Rica; from F. N. Bard, Chicago—a mounted bear, British Columbia; from Lincoln Park Zoo, Chicago—an anaconda and a skink, South America and Australia; from John G. Shedd Aquarium, Chicago—8 fish specimens and a sea turtle; from R. A. Burton, Mt. Pleasant, Iowa—25 Texas salamanders, Iowa; from L. F. Brown, Naples, Fla.—a manatee skull, Florida.

The Library:

Valuable books from Mrs. John King Fairbank, Cambridge, Mass.; Dr. Henry Field, Washington, D. C.; and H. B. Conover, A. B. Wolcott, and Rupert Wenzel, all of Chicago.

Meeting of Orientalists

Several prominent scholars presented papers at a session of the American Oriental Society's annual meeting held in the Lecture Hall of Field Museum April 16. Those who spoke included Dr. Homer H. Dubs, of Duke University; Dr. B. Schwartz, of the New York Public Library; Dr. Florence E. Day, of Dumbarton Oaks Library; Professor J. J. Obermann, of Yale University; Miss Rachel Wischnitzer-Bernstein, and Dr. Alfred H. Lybyer, of the University of Illinois. The delegates were welcomed to the Museum in an address by Dr. Wilfred H. Osgood, Curator Emeritus of Zoology. The Museum gave a tea for the society at the close of the session. The meeting ran from April 15 to 17, other sessions being held at the Oriental Institute of the University of Chicago, and the Art Institute.

NEW MEMBERS

The following persons became Members of Field Museum during the period from March 17 to April 15:

Associate Members

V. D. Berry, Fred J. Clifford, Jr., Mrs. Fred J. Koch.

Annual Members

Robert B. Ayres, Hal Crompton Bangs, J. L. Beven, W. Dale Bost, Ralph E. Bowers, James S. Boyle, C. S. Brophy, P. A. Caswell, Hyman B. Coen, Reuben Don, Robert Driscoll, David B. Eisenberg, Mrs. Helene Feldman, W. L. Fenner, Christ H. Garbers, Dr. Roscoe C. Giles, D. C. Green, Robert E. Hattis, Coleman Hibbard, Carl I. Johnson, Miss Hilda M. Kemper, Miss Lucille M. Larson, James Lawrence, William Levine, Leslie F. Muter, Frank A. Randall, William Schmidt, J. J. Schwander, Lester N. Selig, Joseph Sterling, Mrs. J. O. Stoll, Joseph Wertheimer, C. C. Whittier.

MEMBERSHIP IN FIELD MUSEUM

Field Museum has several classes of Members. Annual Members contribute $10 annually. Associate Members pay $100 and are exempt from dues. Sustaining Members contribute $25 annually for six consecutive years, after which they become Associate Members and are exempt from all further dues. Life Members give $500 and are exempt from dues. Non-Resident Life Members pay $100, and Non-Resident Associate Members $50; both of these classes are also exempt from dues. The Non-Resident memberships are available only to persons residing fifty miles or more from Chicago. Those who give or devise to the Museum $1,000 to $100,000 are designated as Contributors, and those who give or devise $100,000 or more become Benefactors. Other memberships are Honorary, Patron, Corresponding and Corporate, 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.

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 for federal income tax purposes.

Endowments may be made to the Museum with the provision that an annuity be paid to the patron for life. These annuities are guaranteed against fluctuation in amount, and may reduce federal income taxes.

PRINTED BY FIELD MUSEUM PRESS

Field Museum News

Published Monthly by Field Museum of Natural History, Chicago

Vol. 12 JUNE, 1941 No. 6

TADPOLE LIFE IS ILLUSTRATED IN MODELS ENLARGED HUNDREDS OF TIMES

By CLIFFORD H. POPE
CURATOR OF AMPHIBIANS AND REPTILES

What does a tadpole turn into? Although the "Quiz Kids" would consider this question an easy one, only a good naturalist could answer many further tadpole queries. Of all the abundant forms of higher animals, the common "polliwog" is one of the least appreciated. Even students of amphibian life often put tadpoles aside as uninteresting, and laymen are prone to think of them only as generalized blobs of flesh from which frogs and toads arise, scarcely realizing that each kind of frog or toad has its own particular kind of tadpole.

The tadpole's small size and lack of bony skeleton are largely to blame for this neglect; its soft body is hard to handle in life, to preserve for study after death, and to observe either in life or in death. Nevertheless, tadpoles are fascinating animals that differ widely in form, color, and habits. Well over a thousand different kinds exist.

From the frog's point of view the tad is one of the two remaining links in an evolutionary chain that once completely bound the frog to a life in water. The other link is the necessity of breeding in water. If frogs could only sever these two links they would emerge full-fledged land animals like their more advanced relatives, the reptiles, birds, and mammals. At least the frog has the satisfaction of looking down a long nose at the lowly fish which is still completely chained to an aquatic existence.

Let us forget the polliwog's family tree and consider its here-and-now problems. Having never developed the ability to live in salt water, polliwogs must be satisfied with fresh water. Nor are they found north of the temperate regions where perennially frozen soil makes adult amphibian life a complete impossibility.

Another restriction results from the lack of defensive ability; tadpoles are all but helpless against the attacks of certain fishes, their soft bodies making them a most toothsome prey. A few have developed poison glands which, however, have been so little studied that no one knows how helpful they may be. The poison, it would seem, at best might bring them only a Pyrrhic victory, for although they may thus kill the fish that bites them, the tadpoles themselves are also killed in the process. The poison, incidentally, is not at all dangerous to human beings who may happen to handle the tadpoles. Since fishes are universally distributed in large bodies of water, tadpoles must be content to inhabit relatively fish-free places such as small ponds, streams, and temporary pools. Shallow plant-grown edges of rivers and lakes also are favorite haunts because there fishes are rare or at least readily avoided.

Thus we see that tadpoles frequent a mere fraction of the earth's waters. In these they are, however, astonishingly abundant, and presumably it is this abundance that has forced them to make the most of their cramped quarters. A likely pool, for example, may be thought of as a polliwog city so crowded that its inhabitants have invaded every part from the muddy bottom to the very surface from which they sometimes appear to be suspended.

A new exhibit at Field Museum shows just what remarkable creatures these neglected polliwogs are and explains the ways in which they have solved the problem of existence in the face of tremendous competition from other small animals. Models enlarged hundreds of times clearly show the peculiarities scarcely noticeable in the tiny animals themselves.

In order to understand this exhibit one must forget that tadpoles are merely immature frogs and think of them as so many species or kinds of amphibians. Each species is in turn a population of millions of individuals that have become adapted or suited to life in a particular part of the general tadpole environment referred to above. Any one of these parts selected by a species is, let us say, like a cubby-hole in an old-fashioned office desk and may be called a "habitat niche." These niches are so numerous that they have to be classified before being illustrated in a museum.

The left side of the new exhibit does just this under the heading "Major Adaptations." It is not surprising that most tadpoles have

Children Learn About Tadpoles and Frogs

Among visitors to new exhibit on day it was opened were (left to right) Gordon Johnson and Bob Hoffman of LaGrange, Illinois, and Penelope and Stephen Rich (the latter are the children of Director Daniel Catton Rich of the Art Institute of Chicago). Mr. Frank H. Letl of the Museum's staff, who supervised preparation of the exhibit, explained to the group of youngsters how tadpoles live and change into frogs.

chosen bottom niches in quiet water where food and means of protection are plentiful. These "bottom dwellers" are represented by the tadpole of the common bullfrog (*Rana catesbeiana*) with short deep body, high tail fins, and downwardly directed mouth. This species happens to be a veritable giant among polliwogs.

Two of the Tadpole Models in New Exhibit

Upper model represents an extreme oddity, the streamlined Chinese tadpole with expansible mouth somewhat resembling a lily in form. This mouth functions for surface feeding. The tadpole feeds on floating particles by expanding the lips just under the surface and drawing in a current of water. At rest the folded lips curl upward like the points of a crescent moon. The lower model, representing the tadpole of the leopard frog, illustrates gill breathing. Water taken in through the mouth washes the concealed gills and passes out the breathing pore which is on the left side. In this model the transparency of the gill covering is exaggerated in order to show clearly the gills and developing fore limb. Curator Pope says tadpoles do not breathe solely through gills, but these structures are their chief means of obtaining oxygen.

Another major adaptation is the "torrent dweller" represented by a little-known species from the mountains of western North America. The torrent species are few in number but widely distributed over the earth. They have developed a streamlined form that offers little resistance to currents, and a sucker-mouth or sucker-belly by which they cling to rocks, so that they are not swept away by rushing water.

Last but not least interesting of the major adaptations is the "surface dweller" with upwardly directed mouth and ability to float at any level. Feeding on particles caught by the surface film of quiet pond or pool is a simple matter for this uncommon type which cleverly avoids competition with the crowded bottom-loving creatures. It seems to test the saying that "there is always room at the top."

ADAPTATIONS TO SPECIAL CONDITIONS

The remainder of the new exhibit is taken up with two other aspects of tadpole life. First, on the right, a few "special adaptations" are illustrated. The tadpoles shown are species that have some unusual way of getting along in the polliwog world. For example there is the Asiatic tad sometimes called "umbrella-mouth" because of its expansible lips that help in securing minute floating food particles. Second, in the lower center, two models show various features of tadpole structure.

The new exhibit was prepared by Messrs. Frank H. Letl and Joe Krstolick of Field Museum's staff. Mr. Letl made the models by a plastic process applied for the first time in museum exhibition work. They are vastly superior to the wax products formerly in common use. A glance at the new exhibit is sufficient to convince even the most casual observer that Mr. Letl has solved the problem of making life-like replicas of the moist-skinned amphibians. The colors can actually be painted in the plastic material instead of merely on the surface. As in the Museum's celluloid models, transparency or any degree of translucency can be easily attained in the new plastic medium.

SCHOOL CHILDREN COME FROM DETROIT TO STUDY AT FIELD MUSEUM

By MIRIAM WOOD
CHIEF, JAMES NELSON AND ANNA LOUISE RAYMOND FOUNDATION

No greater tribute could be paid to the educational value of Field Museum than the fact that in the eighth grade of a public school in a city as far from Chicago as Detroit, and as large as that motor metropolis, the greater part of a year's course of study has been based upon material and facilities provided in this and certain other Chicago institutions.

The school in question is the Cadillac School, and the plan under which the course has been organized and executed indicates great enterprise on the part of both teachers and students. Educators elsewhere might find it adaptable to their uses.

Forty-three children of the eighth grade in this school, chaperoned by teachers, made a visit of several days to Chicago during their spring vacation. Participation was voluntary, and the trip was planned months in advance. Each child in the party was required to earn at least one-half of his total expenses, figured on a flat-rate all-inclusive basis of $25.25. Permission of parents, of course, was also required. In addition to visiting Field Museum, the children were taken to the Shedd Aquarium, Adler Planetarium, the Museum of Science and Industry, Northwestern University, Union Stock Yards, a candy factory, a radio studio, and Chinatown. The purpose of the whole trip was to present an introduction to various new phases of life, and to offer the children opportunity to begin trying the solution of problems "away from home."

Mr. Charles Yarbrough, leader of the group, had brought a similar group here the previous year, and at that time conceived the idea for this year's more extensive visit and studies. During the months prior to coming to Chicago, preparation was made by adjusting the course of study to coordinate with this plan. Leaflets on certain Field Museum exhibits, and post cards, were obtained in advance and used in classroom work. Thus familiarized, the children knew just what to seek upon their arrival in the exhibition halls.

OTHER ACTIVITIES

From Madison, Wisconsin, a group of 350 boys and girls were brought to Field Museum on May 17. This trip was sponsored by the *Madison State Journal*. Many other out-of-town groups have visited the Museum during the past month. On one single day, 1,373 school children came in organized groups.

On May 15, a meeting was held in the Museum Lecture Hall by teachers of six Chicago special schools for handicapped children, under the auspices of the Jane Neil Club. The purpose of this meeting was to enable members of the Museum staff and the teachers to consult on means for extending the services of this institution to handicapped children on a basis similar to that developed for other groups. Mr. John R. Millar, Curator of the N. W. Harris Public Extension, told of the work conducted by that Department, and the writer spoke on the activities of the Raymond Foundation and told how they could be adapted for crippled youngsters. Dr. Eldridge T. McSwain, Professor of Education at Northwestern University, made a brief address on the responsibility of teachers in using such community resources as those offered by museums.

By invitation of the manager of W9XBK, television station of Balaban and Katz, the Raymond Foundation was enabled again to place Field Museum both aurally and visually "on the air." The program featured Mr. Bryan Patterson, Assistant Curator of Paleontology, who co-operated with the Foundation in preparing a program about prehistoric animals.

Mammalogists to Meet at Museum

The American Society of Mammalogists will hold its twenty-third annual meeting at Field Museum June 9–13. This is a national society of about one thousand members from all parts of the country, including not only professional mammalogists, but wildlife managers, conservationists, sportsmen, and all others interested in mammals from any standpoint. Regular sessions will be open to the public.

The Ainu, a people inhabiting Hokkaido (Yezo), Japan, are rapidly approaching extinction. Their culture is well represented by a collection of artifacts in Hall L.

EXPEDITION TO SOUTHWEST RESUMES EXCAVATIONS

The Field Museum Archaeological Expedition to the Southwest will begin its tenth season of operations this month, under the direction of Dr. Paul S. Martin, Chief Curator of Anthropology. Dr. Martin, accompanied by assistants, will leave Chicago June 10 and proceed to the site of the ancient Mogollon culture in western central New Mexico, near Glenwood, where excavations were conducted in 1939, the last year the expedition was active. Previous to 1939, Dr. Martin conducted excavations on Basket Maker sites in Southwestern Colorado, and the work in New Mexico represents the beginning of a new phase of his investigations. In the one season thus far spent on the Mogollon site it was about one-quarter excavated. Because this site has yielded new manifestations of a culture only recently discovered in the Southwest, Dr. Martin and other archaeologists with whom he has consulted are agreed that it is advisable to dig as many houses, pits, graves, refuse heaps, etc. connected with these prehistoric Indians as possible. Only thus can be obtained sufficient data upon which to base any general conclusions.

The Mogollon culture was first discovered by Mr. Harold S. Gladwin, Director of Gila Pueblo Museum, and has been further investigated by Dr. Emil Haury, assistant to Mr. Gladwin. It differs in every way from the other two known Southwestern cultures, the Hohokam and Pueblo. The Mogollon people lived in pit houses of a type different from those of the other cultures; their pottery is plain, brown, and red; their stone and bone implements are equal in simplicity of form to those of the other cultures, but different in type.

It now appears that the manifestations of this culture which Dr. Martin investigated in 1939, and upon which he will continue work this summer, are probably earlier than those studied by Dr. Gladwin and Dr. Haury, and the civilization even simpler. The stone tools which he collected are apparently related to very early ones from southern Arizona which may date to between 1,000 and 2,000 B.C. The Mogollon pottery obtained by Dr. Martin may prove to be the oldest yet discovered in North America. Numerous burned roof logs were recovered and sent to Mr. Gladwin for dating, but so far the series of tree-rings on these timbers does not fit with any known sequence on any of the master tree-ring calendars employed by modern archaeologists in the dendrochronological system of establishing prehistoric dates. This lack of pieces to match master charts may mean that these timbers were cut earlier than any others yet studied, says Dr. Martin; however, he emphasizes that the mere fact they have not yet been dated does not necessarily establish them as definitely earlier.

From twenty-four human skeletons excavated in 1939, Dr. Martin has determined that racially the Mogollon people were the same as the Pueblo people. The skulls conform strikingly in most features with skulls of the Pueblo types.

Dr. Martin will remain in the field until autumn. This project and his series of nine preceding expeditions form part of the larger project, to which many leading archaeologists are contributing, of reconstructing all the history and prehistory of American aborigines so that eventually the records will be as complete as those we now have of such ancient civilizations as Babylonia, Egypt, Greece and Rome.

WHY DIG UP DEAD INDIANS?

By PAUL S. MARTIN
CHIEF CURATOR, DEPARTMENT OF ANTHROPOLOGY

Year after year, as I depart for or return from expeditions, people ask me why we are so eager to investigate the life of ancient North American peoples—in short, why dig up dead Indians?

This is a good question and one which is easy to answer.

We are living today in a very sick world. If civilization is to endure, we must push forward the study of man. We need to know the strength as well as the weaknesses of the human race and to understand the relationship of man to culture. We must know this because the tremendous machine which science has helped create may be directed by man for good as well as for evil. At present the machine is being run mostly for destructive purposes. Many people blame science for this state of affairs.

Actually this is a childish and ignorant point of view. The present chaotic condition of the world is not new; it is only worse than before. Every major invention, from the time of the first use of fire or from the time of the first stone ax or arrowhead down to the airplane and radio, though at first bringing great material benefit and comfort, has sooner or later created social and economic problems. Fire is useful for warmth and cooking but it may be used for destructive purposes. A stone arrow head is useful for hunting animals, the skins of which may be used for clothing, and the meat for food; but an arrowhead may also be used for killing other men. And so it goes. The airplane is useful for peaceful commerce, but it also carries death; the radio brings entertainment and education, but also it sometimes spreads poisonous propaganda.

We must understand how the products of science affect the philosophy of life and the science of government. By studying the Basket Maker, the Mogollon, and other Indians we have an opportunity for the study of the rise and spread of a culture, the dominance of rulers and priests, civil wars and other rivalries, the effect of climate, the decline and eventual fall of a virile culture, and finally the effects of submission to a foreign military conquest.

If we can understand all of these facets of life in a relatively simple Indian culture, and if we can discover the whys and wherefores, then we are in a much stronger position for understanding and attacking the greater and more complex historical problems which must be solved if we are to attain real knowledge of man in the modern world.

Thus, digging up dead Indians has a very real significance and, if looked at in this way, it actually has possibilities which stagger the imagination.

Many people probably think of Indians as wild, yipping, horseback-riding fellows who spent much of their time looking for people to scalp, and who did little or no work. Such a picture is incorrect. It is true that the Plains Indians did ride horses and did do some scalping; but this way of living developed after the year 1750.

Indians did not ride horses until Europeans introduced horses to the New World, for the simple reason that there were none here. Even after horses became common, the Indians of the Plains were about the only ones to use them extensively.

In the old days before the original patterns of Indian culture were broken by the advent of Europeans, life was quite different. In the Southwest, for example, the so-called Basket Maker Indians lived a simple, quiet life. They were farmers who grew corn and squash, hunted when they needed meat, and carried on religious ceremonies.

The Indians who built and lived in the houses excavated by archaeologists today were just simple, plain people, very much like you and me. They had joys and sorrows, hard and easy times. Thus, we see that we are merely a part of the continuity of life—but also, that there *is* a continuum of culture despite human aberrations.

GUATEMALA EXPEDITION BRINGS 38,000 PLANTS TO MUSEUM

By PAUL C. STANDLEY
CURATOR OF THE HERBARIUM

The Third Botanical Expedition of Field Museum to Guatemala began work early in October, 1940. Like two previous expeditions, its purpose was the collection of material and data for preparation of a comprehensive descriptive account of the country's vegetation.

In area about the size of Illinois, Guatemala is extremely varied as to surface and climate. Because of the great local variations in elevation and temperature, there often are abrupt modifications of the vegetation within a few miles.

Collecting was begun at Zacapa, in the relatively arid valley of the Motagua River, near the north coast. Afterwards work was conducted from Jutiapa, Jalapa, Cuilapa, and Chiquimulilla. From the last, lying at the base of the Volcano of Tecuamburro, a comprehensive collection was made of the flora of the Pacific plains in which little collecting had been done previously.

In December headquarters were moved to central Guatemala, at Finca La Alameda, near Chimaltenango, where every facility for work was supplied by Dr. John R. Johnston, Director of the Escuela Nacional de Agricultura. Extensive collections were made in that vicinity, at Fiscal, and on the Volcano of Pacaya.

REMINISCENT OF COLORADO

Dr. Johnston and the writer next moved to Huehuetenango in northwestern Guatemala, collecting along the route. The Department of Huehuetenango is a non-volcanic area along the Mexican frontier. The most distinctive and profitable region was the Sierra de los Cuchumatanes, highest portion of the northern cordillera.

An especially noteworthy portion of the season's collections, and the one richest in new species or additions to the Guatemalan flora, was gathered in the Cuchumatanes. For miles the road is bordered by alpine meadows, as in the Colorado Rockies, thickly covered with grass and decorated with dwarf plants of various families. Bearberry and gentians heighten the resemblance to the Colorado mountains, as do the dense forests of red cedar and pine that cover the bordering limestone hills. Strangely, one of the most abundant and showy plants at this high elevation, where freezing temperatures are recorded almost every night, is a huge agave or century plant, scarcely to be expected at so high an altitude. Here also was found a gooseberry, the first member of its group to be collected in Central America.

SHOWERS OF VOLCANIC ASHES

My next headquarters were at Quezaltenango, second city of Guatemala, with an elevation of almost 8,000 feet, and a climate far from tropical—heavy frost was frequent, and one night the thermometer fell to 15 degrees. From there may be reached, within one or two hours, many localities exceedingly rich in tropical vegetation. From the valley of the Río Samalá, and the barranco lying between San Martín Chile Verde and Colomba, many rare plants were obtained. The Volcano of Santa María was in eruption during February, covering some of the vegetation with a layer of ash that made collecting far from enjoyable, since every bush that was touched showered ashes upon one's head.

Several weeks in February and March were devoted to work along the Pacific foothills and upon the bordering plains. Many rare plants, especially trees, were collected in this vicinity.

WHERE ORCHIDS ABOUND

Collecting localities along the Pacific coast extended from Coatepque eastward to Escuintla and Amatitlán. Then headquarters were moved to Cobán in the Department of Alta Verapaz, which has one of the most varied and fascinating floras of all Central America. It is humid, with medium elevations, and is particularly rich in orchids, which are more abundant than anywhere in Central America outside Costa Rica. Here grows in great abundance one of the handsomest of American orchids, *Lycaste Skinneri*, whose albino variety, the *monja blanca*, is celebrated as the national flower of Guatemala.

Although Cobán is the center of a coffee region and of a rich agricultural area, it retains much accessible unspoiled forest, and profitable botanical collections may be made almost anywhere within easy walking distance of the town. Collecting trips were made in every direction, especially about Tactic, which has an apparently inexhaustible variety of plants. A previously unexplored open and forested swamp yielded a surprising number of probably new, or at least very rare species.

One day only could be devoted to collecting along the new road leading from Cobán toward Petén. The expedition left Puerto Barrios May 3, arriving at Chicago May 11. It was highly successful, more than 19,000 numbers of plants, represented by twice as many specimens, having been gathered. It is believed that a substantial number of plants new to science was collected, and it is certain that there were obtained many species which are new to Guatemalan and to Central American records.

The satisfactory results are due largely to the splendid system of automobile roads. Through the enterprise of General Jorge Ubico, President of Guatemala, the republic now possesses the most comprehensive road system, for its area, to be found in America south of the United States.

For innumerable and often very practical courtesies, the expedition is deeply indebted to Don Mariano Pacheco Herrarte, Director General de Agricultura; to Professor Ulises Rojas, Director of the Jardín Botánico; to Don José Ignacio Aguilar, Director of the Finca Nacional La Aurora of Guatemala City; and to various government officials, particularly the Director General de Aduana and the several Jefes Políticos.

It is impossible to express adequately appreciation of the hospitality and courtesies extended by Dr. John R. Johnston, by Mr. and Mrs. B. E. Lewis, and by employees of the Ferrocarril Internacional de Centro-América, the United Fruit Company, and the Compañía Agrícola de Guatemala. Special appreciation is due Mr. George B. Austin of the United Fruit Company, at Puerto Barrios.

THE ANTIQUITY OF TREPANNING

By HENRY FIELD
CURATOR OF PHYSICAL ANTHROPOLOGY

To relieve pressure on the brain a trepan, or the modern improved instrument known as the trephine, is employed to remove a portion of the bone. In tracing back the antiquity of trepanning we find that it was performed frequently about 10,000 years ago in Neolithic times, especially in western Europe and in Bohemia. Evidences of trepanning in relatively early times have also been found in Bolivia, Peru, and North and Central America. There is no evidence of the operation being performed by either the Hindus or the Chinese, or among the Greeks and the Romans. A single doubtful example is known from Egypt. Some trepanned skulls have been discovered in Gaul, belonging to an epoch corresponding to that of Roman civilization. The contemporary hill tribes of Daghestan, the natives of Tahiti, the Polynesians and Loyalty Islanders, the Kabyle tribes, Montenegrins, and the Aymara Indians in Bolivia, and probably dwellers in the highlands of Peru, still perform this operation, and thus express their belief in its efficacy.

The operation is often performed, following a depressed skull fracture, by means of a sharp knife, piece of glass, or sharp-edged stone. The trephine hole is usually located on the upper and posterior part of the parietal bone. The section of bone thus removed, highly prized by prehistoric peoples, was worn as an amulet in a necklace. Many of the skulls show evidence of more than one operation, and as many as four have been seen. The openings are often large and crudely made, and the operation, fatal in a very high percentage of cases, must have been excruciatingly painful.

Some authorities believe that prehistoric surgical trephining was performed for the relief of certain internal maladies, such as to rid the individual of a "demon" blamed for causing dreaded symptoms.

Trephining is performed as one of the standard operations in modern surgery.

A ZOOLOGICAL FIELD TRIP TO ARKANSAS AND TEXAS

While the great emphasis of Field Museum's exploration and research by the Department of Zoology lies in foreign fields, some contact is maintained with studies on systematic zoology and on the related problems of animal distribution in the United States. Texas and Arkansas, fairly close at hand and with a relatively rich animal life, are regarded as favorable regions for such study by the Division of Reptiles. A continued program of field work in these states will make possible a more effective concentration of the Museum's work and will especially provide a sphere of activity for the younger generation of volunteer naturalists who constantly appear at the Museum.

AUTO KILLINGS AID SCIENCE!

To further this interest of the Division of Reptiles, Mr. Karl P. Schmidt, Chief Curator of Zoology, recently made a brief collecting trip to Arkansas and Texas, accompanied by his son, Mr. John M. Schmidt, and in the company of Mr. C. M. Barber of Hot Springs, Arkansas, a former member of the staff of Field Museum. An active collector of living reptiles as well as of Cretaceous fossils in his state, Mr. Barber is a constant contributor of specimens to the Museum. A trip at this time of the year yields much information as to the distribution of reptiles, especially snakes, from the numerous specimens killed on the highway by automobiles. These "dor" specimens ("d-o-r" for "dead-on-road"), if accurately identifiable, yield information as to distribution and abundance of the species, which, if accumulated in a systematic manner, adds greatly to our knowledge of geographic distribution in the area studied.

It was especially planned to meet as many as possible of the amateur and professional zoologists of Texas interested in the study of reptiles. The party accordingly joined the Annual Field Meet of the Texas Herpetological Society at the Stephen F. Austin State Park at San Felipe, in Austin County, on April 19. Chief Curator Schmidt addressed this group and spoke also to the active group of zoological students in the Fish and Game Club of the Texas Agricultural and Mechanical College, at the invitation of Dr. Walter P. Taylor.

Dr. C. S. Smith, Professor of Biology at the San Marcos State Teachers' College, and President of the Texas Herpetological Society, and his assistant, Dr. S. S. Wilks, entertained the party at San Marcos and gave them much aid in visiting local caves in the vicinity. This region is of great zoological interest because of its development of cave forms, including a remarkable blind white salamander in underground waters.

En route north from San Marcos, a visit was made to the Texas Memorial Museum and the University of Texas, at Austin, and to the John K. Strecker Museum at Baylor University, Waco, Texas. Dr. Leo T. Murray, Director of the Strecker Museum, presented several lots of interesting snakes. At Hot Springs, Mr. Schmidt addressed the Hot Springs Natural History Society, on "A Naturalist's Glimpse of Peru."

SOME STRANGE BIRDS

By RUDYERD BOULTON
CURATOR OF BIRDS

An exhibit of some of the most extraordinary and famous birds of the world was recently installed in Hall 21. They comprise typical and representative species belonging to the families of herons, storks, flamingos, ibises, hawks, eagles, and falcons. The most remarkable, perhaps, is the whale-headed stork or shoe-bill, a gigantic stork-like bird that lives in Africa. It gets its name from the huge, ungainly bill, so large in fact that when the first specimen was brought to Europe in 1848 it was thought to be an abnormal pelican. Later anatomical research demonstrated the fact that this bird, which stands almost five feet high, is intermediate in character between herons and true storks. Both of its common names refer to the strange bill—even its Arabic name, *Abu-markub*, means "father of a shoe."

Whale-headed Stork, or Shoebill

When specimens of this odd and somewhat sinister-looking character from Africa first arrived in Europe in 1848, ornithologists could scarcely believe their eyes. They concluded that it was "an abnormal pelican."

Whale-headed storks are found only in the Sudd marshes along the upper White Nile, and are most common in the wide stretches of papyrus swamp at Lake No. Their nests are built of platforms of papyrus stems in the marsh, and the eggs, being white, are stork-like. The reputed diet of these birds is no less extraordinary than their other characters. They are said to use their huge bills to dig aestivating lungfishes out of the mud; and these form an important part of their food. ("Aestivating" might be ambiguously but effectively described as "hibernating in summer.")

The saddle-billed stork, another inhabitant of Africa, is perhaps a little more normal in character, but no less distinguished in appearance. This bird although more slender, stands fully as high as the shoebill, and its white and glossy black plumage make it very conspicuous in the marshes of the rivers of tropical Africa. For this reason, probably, it is wary and shy. Its parti-colored bill, black and scarlet, is more than twelve inches long. The name of this stork is derived from the fact that on top of the bill, just in front of the eyes, there is a saddle-shaped area of soft fleshy skin, chrome yellow in color, while immediately below there are two tiny wattles which ornithologists have fancifully likened to the stirrups of a saddle.

LARGEST FLYING LAND BIRD

The best known bird of prey recently placed on exhibition is the South American condor, the largest flying land bird. This bird is characteristic of the Andes, and it is fairly common through the arid coastal ranges of Peru, as well as in some places in the mountains of southern Chile. The wing spread of a condor is probably not quite as great as that of a large wandering albatross, but the area of the wings is greater, and the condor weighs considerably more.

On the bird islands of Peru, populated by millions of sea birds, condors become an economic problem because they feed on young pelicans, boobies, and cormorants.

Among other important birds that are shown in this exhibit are the Chilian flamingo, the straw-necked ibis of Australia, the scarlet ibis of northern South America; the white headed vulture and griffon vulture of Africa and Asia respectively; the lammergaier of Europe, and the Bateleur eagle of Africa.

Specimens have come from a number of Field Museum expeditions, among them being the Straus West African expedition, the *Chicago Daily News* Abyssinian Expedition, and the Mandel-Orinoco Expedition. Other specimens have been contributed by the Chicago Zoological Society and the Lincoln Park Zoo. The exhibit was prepared by Staff Taxidermist John W. Moyer.

Field Museum of Natural History
FOUNDED BY MARSHALL FIELD, 1893
Roosevelt Road and Field Drive, Chicago
TELEPHONE: WABASH 9410

FIELD MUSEUM NEWS

EDITOR
CLIFFORD C. GREGG.....*Director of the Museum*
ASSOCIATE EDITOR
WILFRED H. OSGOOD.....*Curator Emeritus, Zoology*
CONTRIBUTING EDITORS
PAUL S. MARTIN.....*Chief Curator of Anthropology*
B. E. DAHLGREN.....*Chief Curator of Botany*
HENRY W. NICHOLS.....*Chief Curator of Geology*
KARL P. SCHMIDT.....*Chief Curator of Zoology*
MANAGING EDITOR
H. B. HARTE.....*Public Relations Counsel*

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

A PEEK BEHIND THE STATISTICS

The broad extent of a museum's influence has frequently been alluded to in these columns and elsewhere. We have told, for example, how Field Museum's educational activities directly reach more than two million persons a year when the number of visitors is summed up together with the hundreds of thousands reached extra-murally by the lecturers of the Raymond Foundation and the traveling exhibits of the Harris Extension.

Only occasionally, however, do individuals who have benefited from the Museum reveal in detail what the institution has done for them. Such narrowed-down "case histories," when they do come, give a more vivid picture of the workings of the Museum's influence than do mass statistics, and further, they hint of the similar effects the institution may have upon hundreds of thousands not heard from who are comprised in the statistical figures. Under the title "How I Came to Collect Minerals," Miss Selma Jenner, of Mayfield, Wisconsin, tells in a recent bulletin of the Marquette Geologists Association what Field Museum has meant for her. Excerpts from her article follow:

" 'Here are some things that have turned to stone.'—This statement was made by my father when he brought them from the depths of his numerous overalls pockets. He had cleared the willows and shrubs from a lowland, and was draining it and plowing it when the black soil revealed perfect Silurian petrified corals.... We then did not know what they were, but our curiosity concerning them was greatly aroused. We treasured them highly and... I finally took them to Field Museum for classification, which revealed them to be honeycomb corals, chain corals, cup corals, organ pipe corals, a macaroni coral, a siphuncle of a cephalapod, and several others.... The geologists of Field Museum went a step further and told me that these existed 500,000,000 years ago in a tropical ocean extending over this part of the country to the North Pole. This was very thrilling to me, for I knew nothing of geology. On the strength of that I inquired how I could find out more about it. They then directed me to the Museum's Library ... I also bought books and kept on nosing around in paleontology and geology myself until one day I complained to Chief Curator Nichols about not being able to find anybody interested in the subject outside the Museum staff. Again my requirement was graciously looked out for, and he directed me to a group of his friends who were organizing a geology club.... I have never missed a meeting... I have gained knowledge of not only paleontology but also mineralogy and now have a collection of minerals—also a granite collection.... I am grateful beyond measure to the geologists and friends who have helped me in this very interesting hobby."

Mrs. James Nelson Raymond Again Contributes Funds

Continuing the generous contributions she has made at frequent intervals for years, Mrs. James Nelson Raymond last month again gave Field Museum $2,000 for use in carrying on the manifold activities of the James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures. The Foundation, established by Mrs. Raymond in 1925 with a munificent endowment, is a vital factor in the success of Field Museum's educational work, and its services to school children and their teachers have been notably expanded in recent years. Such expansion has been greatly expedited by the unceasing interest and support given by Mrs. Raymond.

Museums Win Over the Movies

(From the *St. Louis Post-Dispatch*)

The results of a survey just announced at Northwestern University should make parents and teachers feel much more hopeful about the younger generation. For Professor Walter A. Anderson has discovered, by questioning 560 children, that 54 per cent of them would rather visit a museum than a neighborhood movie.

To any beholder of the noisy and enthusiastic audiences found in most movie theaters on Friday night or Saturday afternoon this will be an amazing discovery. However, a lot of that noise may be mass exuberance rather than film appreciation. Interviewed alone, many a youngster has some pretty sharp criticism to make—too much "love stuff" or "same old troubles and then a happy ending" or simply "I have a headache."

Museums may seem dull to some adults, but then some adults are blasé, fed up and incurious. To the active and spongelike mind of a boy or girl the museum's marvels are a challenge, an inspiration, a source of perpetual wonder and miles of questions.

Maybe parents have been overlooking a bet by capitulating immediately when a trip to the movies is proposed and not suggesting that the museum might be interesting instead.

Colonel Roosevelt, Museum Trustee, Returns to His Regiment

Colonel Theodore Roosevelt, a member of the Board of Trustees of Field Museum, has been called to active duty in the United States Army, and is again in command of his old regiment, the 26th Infantry, at Fort Devens, Massachusetts. During the first World War, Colonel Roosevelt was a member of this regiment overseas.

The Blue Bull of Asia

Have you ever seen a blue bull? In Asia there is such an animal—it's a large antelope, and is also called nilgai. A habitat group of nilgai, which despite their name are not really blue in color, is on exhibition in William V. Kelley Hall (Hall 17).

A FEW FACTS ABOUT FIELD MUSEUM

Field Museum is open every day of the year (except Christmas and New Year's Day) during the hours indicated below:

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

Free courses of lectures for adults are presented in the James Simpson Theatre on Saturday afternoons (at 2:30 o'clock) in March, April, October, and November.

A Cafeteria serves visitors. Rooms are available also for those bringing their lunches.

Chicago Motor Coach Company No. 26 busses provide direct transportation to the Museum. Service is offered also by Surface Lines, Rapid Transit Lines (the "L"), interurban electric lines, and Illinois Central trains. There is ample free parking space for automobiles at the Museum.

PALEONTOLOGICAL EXPEDITION LEAVES FOR COLORADO

A Field Museum paleontological expedition to western Colorado left Chicago at the end of May for a three and a half months' stay in the field. The personnel consisted of Mr. Bryan Patterson, Assistant Curator of Paleontology, and Mr. James H. Quinn, Chief Preparator in Paleontology; other persons will join the party for various periods of time. Other expeditions from the Museum have operated in this region during 1932, 1933, 1937 and 1939; the present one therefore carries on a well established program. Much interesting material, a large proportion of it previously unknown, has been obtained during this work.

The field of operations of the expedition will lie in Mesa and Garfield Counties, and the main objective will be to collect fossil mammals from early Eocene deposits. Specimens from this early horizon are of great interest to students of mammalian evolution. The Age of Mammals was then in its infancy; many groups that no longer survive were flourishing, and several of the dominant mammalian types of today were just getting under way. To take but one example, the horses of the early Eocene were no larger than foxes, possessed four toes in contrast to the modern horse's one, and were barely distinguishable from contemporary primitive tapirs.

Staff Notes

Dr. Julian A. Steyermark, Assistant Curator of the Herbarium, made a field trip to Missouri last month to collect plant material.

Mrs. Leota G. Thomas, of the Raymond Foundation staff, attended the annual meeting of the American Association of Museums at Columbus, Ohio, May 15 and 16.

Mr. Paul G. Dallwig, the Layman Lecturer of Field Museum, presented a special version of his lecture, "Gems, Jewels and 'Junk,'" on May 8 before the members of the Hoosier Salon Patrons Association.

Dr. Louis B. Bishop, of Pasadena, California, Research Associate in the Division of Birds, recently visited the Museum to consult staff members on the progress of work upon the Bishop Collection of Birds, for the formation of which he was responsible. Acquired in 1939, this collection contains approximately 50,000 specimens, and is one of Field Museum's most important accessions of recent years.

Mr. Rupert L. Wenzel, Assistant Curator of Insects, recently visited museums in New York, Washington, and Pittsburgh to continue research on various problems connected with bat flies and histerid beetles.

THINGS YOU MAY HAVE MISSED

Models Show Predecessors of Giant Steel Furnaces That Work for Defense Today

Today, with the defense of his country uppermost in every American's mind, the nation calls for steel—millions of tons of steel—steel for ships and tanks and munitions, steel for rails and wheels, steel for motors and machine guns, steel for an almost endless variety of products. Hundreds of furnaces belch smoke and flame to the skies, each pouring forth every day from about 100 to as much as 1,000 tons of the vital metal. More than 30,000,000 tons were produced in the course of even a normal year before military requirements called for the super-production now demanded.

An interesting contrast is provided by the model (in Frederick J. V. Skiff Hall—Hall 37) of a Catalan forge which about 170 years ago did a good day's work when it produced a mere 300 *pounds* of iron each six hours. This type of forge was in general use in Europe during the eighteenth century, and in this country at the time of the War for Independence and for some years after. Forges of the same general type have been used among peoples of the more primitive cultures in relatively recent times, and they may have persisted in some places to the present day, says Mr. Henry W. Nichols, Chief Curator of Geology. The forge is small, not much larger than an ordinary blacksmith's forge.

Displayed with the Catalan forge are models of a cold blast iron smelting furnace of the type most common in this country about ninety years ago, and of a modern hot blast furnace. The cold blast furnace is so called because the blast of air by which it was kept in operation was not heated. It was the immediate predecessor of the hot blast furnace of today which has now completely superseded it. It was in general use in this country during and for some time after the Civil War. A furnace of the type represented in the model was capable of producing about thirty tons of pig iron per day.

Formerly of chief importance for its own product, iron, the modern blast furnace today is of more importance as a supplier of iron for further processing in open hearth furnaces where it may be converted by various formulae into the many different types of steel. Steel, being so much stronger and more workable, is more practical than iron for the wide range of demands made by modern industry. A large amount of iron, of course, is still required for many purposes, and heavy production of the iron blocks called "pigs" is still an important function of blast furnaces. Where a steel works is connected with the furnace plant, however, the molten iron as tapped from the furnace is conveyed in huge so-called "ladles" directly to the mills for conversion into steel.

Primitive Iron Smelting Plants

An exhibit in the Department of Geology. Model at left represents a Catalan forge of type in general use in Europe during eighteenth century, and in this country at the time of the American Revolution. Model at the right represents a cold blast furnace which was the type most common in the United States up to about ninety years ago.

Veteran Preparator Dies

Mr. Herbert Weeks, a preparator in the laboratories of the Department of Anthropology since 1918, died on May 13. Mr. Weeks was a skillful artisan and was responsible for the installation of exhibits in case after case throughout practically all divisions of the department. His final, and one of his finest installations was that of the Department of Anthropology's section of H. N. Higinbotham Hall (Hall 31, the Gem Room) which may be opened some time in June.

To understand animals, it is as necessary to study their internal structure as to observe their external appearance. For this reason Field Museum maintains extensive osteological exhibits in Hall 19 where may be found skeletons representing almost every important group of vertebrates.

JUNE GUIDE-LECTURE TOURS

Conducted tours of exhibits, under the guidance of staff lecturers, are made every afternoon at 2 o'clock except Saturdays, Sundays, and certain holidays. Following is the schedule for June:

Week beginning June 2: Monday—Defense Weapons and How Wild Animals Use Them (Miss Elizabeth Best); Tuesday—General Tour; Wednesday—Plants With Romantic Stories (Miss Marie B. Pabst); Thursday—General Tour; Friday—Where Did The Indians Come From? (Miss Elizabeth Hambleton).

Week beginning June 9: Monday—The Earth As a Geologist Sees It (Bert E. Grove); Tuesday—General Tour; Wednesday—Tree Dwellers of the Animal Kingdom (Miss Elizabeth Best); Thursday—General Tour; Friday—The Rights of Men (Miss Elizabeth Hambleton).

Week beginning June 16: Monday—Trees of the Chicago Region (Miss Marie B. Pabst); Tuesday—General Tour; Wednesday—Plants and Animals Through the Ages (Bert E. Grove); Thursday—General Tour; Friday—The Meat-eaters (Miss Elizabeth Best).

Week beginning June 23: Monday—How the Ancient Egyptians Lived (Miss Elizabeth Hambleton); Tuesday—General Tour; Wednesday—Development of Plant Life (Miss Marie B. Pabst); Thursday—General Tour; Friday—Chicago During the Ice Age (Bert E. Grove).

Monday, June 30—Modern People and Our Ancestors (Miss Elizabeth Hambleton).

Persons wishing to participate should apply at North Entrance. Tours are free. By pre-arrangement with the Director, special tours are available to parties.

GIFTS TO THE MUSEUM

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

Department of Botany:

From Instituto del Museo, La Plata, Argentina—61 herbarium specimens, Argentina; from Dr. Hugh Cutler, St. Louis, Mo.—193 herbarium specimens, Guatemala, Mexico, Louisiana, and Texas.

Department of Geology:

From C. M. Barber, Hot Springs, Ark.—9 specimens of fossil vertebrates, Arkansas; from Edwin B. Faber, Grand Junction, Colo.—3 specimens of fossil shark and ray in matrix, Colorado; from W. G. Rinehart, Batesville, Ark.—3 mineral specimens, Arkansas.

Department of Zoology:

From Instituto Butantan, Butantan, Brazil—12 coral snakes, Brazil; from Emil Liljeblad, Villa Park, Ill.—2,409 beetles and other insects, California; from H. B. Conover, Chicago—3 birds, Virgin Islands and Peru; from Chicago Zoological Society, Brookfield, Ill.—11 birds, 5 mammals, and an albino bull snake; from Clyde T. Reed, Gregory, Tex.—107 fish specimens, Texas; from Lincoln Park Zoo, Chicago—a hinge-back tortoise, a skink, a clawed frog, and 20 turtle eggs; from John G. Shedd Aquarium, Chicago—a turtle, Florida; from Leslie Hubricht, St. Louis, Mo.—4 salamanders, a frog, and 9 lizards, Utah, Arizona, and New Mexico; from James Simpson, Jr., Chicago—a mounted wild sheep head, Central Asia; from Mr. and Mrs. L. F. Brown, Naples, Fla.—4 Florida duck skins; from Major R. D. Hildebrand, Fort Worth, Tex.—3 wood duck skeletons, Texas; from Robert Burton, Mt. Pleasant, Iowa—47 snakes, frogs, and salamanders, Iowa; from Dr. Clay G. Huff, Chicago—2 blue grouse skins, Montana; from Charles Breder, New York City—60 fish specimens, Florida.

The Library:

Valuable books from American Petroleum Institute, New York City; and Conoco Travel Bureau, and Rupert Wenzel, both of Chicago.

Layman Lecture Season Ends; To Resume in November

With the completion of his Sunday afternoon lectures in May, Mr. Paul G. Dallwig, the Layman Lecturer of Field Museum, has closed a season showing the highest attendance since he inaugurated this activity in October, 1937. During the 1940–41 season which began in November, Mr. Dallwig lectured before thirty audiences in the halls of Field Museum, with a total attendance of 3,040, or an average of 101 persons at each lecture. Many more would have attended if it were physically possible to extend the number of permitted reservations, but parties must be limited in size to make it practicable to conduct them through the halls containing exhibits used to illustrate the lectures.

Since the inauguration of the Sunday lectures in 1937, Mr. Dallwig has appeared before a total of 128 audiences aggregating 11,191 persons. Mr. Dallwig has also been in demand as a platform speaker, and has appeared before twenty-one clubs and other organizations during the last year.

Mr. Dallwig will resume his lectures next season, commencing in November, 1941, and running through May, 1942. He plans on adding one new lecture to his series each year. This year the lecture on "Mysterious 'Night-Riders' of the Sky" was new. For next season he plans on adding "Who's Who in the Mounted Zoo" to his repertoire, making a total of seven different lecture subjects, one for each of the seven months during his lecture season.

Single Poppy Species Yields Opium

Poppies of various kinds are well known as flowering plants, but only one species *Papaver somniferum*, is used to produce opium. The flowers are solitary, large, with four white to purple petals. A several-celled ovary develops into an ovoid capsule about two inches long, having many small seeds. Opium is obtained from the unripe fruits which are incised with a guarded knife to allow the juice to exude. This juice, when dried, forms the opium of commerce which is used chiefly in the form of its alkaloid morphine to allay physical suffering. The seeds have no physiological action and are commonly dusted on cookies and buns, to which they impart a distinctive flavor.

NEW MEMBERS

The following persons became Members of Field Museum during the period from April 16 to May 15:

Associate Members

Mrs. Willis Roland Ford, Mrs. James M. Hopkins, Jr., Dr. Beveridge H. Moore, Glenn W. Traer.

Annual Members

Jay Adler, Royal V. Andrus, A. D. Arado, William H. Beckman, Joseph L. Berman, Edward L. Berry, L. R. Boulware, Dr. Henry P. Bourke, Mrs. Benjamin W. Bradley, Rev. Joseph H. Branham, Louis A. Breskin, John P. Bretschneider, John H. Brine, N. F. Clayborne, Dean W. Davis, Gabriel Dunkleman, Dr. Nicola Emanuele, Robert B. Emery, Paul Hansen, Miss Susan D. Hoyne, Dr. Thomas G. Jones, Mrs. W. L. Keady, Ronald J. Lambert, Mrs. Louis Lindenthal, Thomas J. McKittrick, Joseph M. Moskow, N. A. Nelson, Jr., Dr. Nicholas B. Paveltic, J. J. Reingold, Dr. Mary G. Schroeder, Ezra Sensibar, John W. Walz, Ernest N. Warner, L. F. Wilson.

MEMBERSHIP IN FIELD MUSEUM

Field Museum has several classes of Members. Annual Members contribute $10 annually. Associate Members pay $100 and are exempt from dues. Sustaining Members contribute $25 annually for six consecutive years, after which they become Associate Members and are exempt from all further dues. Life Members give $500 and are exempt from dues. Non-Resident Life Members pay $100, and Non-Resident Associate Members $50; both of these classes are also exempt from dues. The Non-Resident memberships are available only to persons residing fifty miles or more from Chicago. Those who give or devise to the Museum $1,000 to $100,000 are designated as Contributors, and those who give or devise $100,000 or more become Benefactors. Other memberships are Honorary, Patron, Corresponding and Corporate, 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.

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 for federal income tax purposes.

Endowments may be made to the Museum with the provision that an annuity be paid to the patron for life. These annuities are guaranteed against fluctuation in amount, and may reduce federal income taxes.

PRINTED BY FIELD MUSEUM PRESS

Field Museum News

Published Monthly by Field Museum of Natural History, Chicago

Vol. 12 JULY, 1941 No. 7

GEMS AND JEWELS GAIN NEW SPLENDOR IN REBUILT H. N. HIGINBOTHAM HALL

A "gem of a room" for the housing of one of the world's most comprehensive collections of gems and jewels—that was the aim of the administration of Field Museum in closing H. N. Higinbotham Hall (Hall 31) last September, temporarily removing the priceless treasures, and completely rebuilding the hall architecturally and as to style of installation and lighting of exhibits.

This reconstruction has now been completed, and the gems and jewels, with the addition of a number of new specimens, have been reinstalled in a manner that brings out their full beauty of color, luster, and brilliance as never before. In all, more than 3,000 specimens are displayed in new "jewel-box" cases which rival the gems themselves in scintillating brightness.

The original and major part of the collection was presented to Field Museum by the late Harlow N. Higinbotham, a prominent leader in Chicago civic affairs during his lifetime. Mr. Higinbotham was a Trustee of the Museum from 1894 until his death in 1919; he was also the second President of the institution, serving with great distinction in that capacity from 1898 to 1908. The collection he presented had been assembled through the efforts of Dr. George F. Kunz, and had been exhibited by Tiffany and Company at the World's Columbian Exposition in 1893. This notable gift, and his many other contributions to the Museum, place Mr. Higinbotham's name among the foremost benefactors of this institution.

Additions have been made to the collection, from time to time, as desirable pieces have been obtained by Museum expeditions or as gifts from other benefactors.

NEW GIFT FROM MRS. CRANE

A few days before the official opening and tea given by the Museum June 19 for its members and their guests, Mrs. Richard T. Crane, Jr. (a daughter of the late Harlow N. Higinbotham) made a notable gift of gems and jewelry. The new pieces, which are of high value and great interest, were immediately installed in their proper places with relation to the rest of the exhibits. The collection presented by Mrs. Crane consists of gems assembled originally by Dr. Kunz of Tiffany and Company who brought together the original Higinbotham collection. Included among the new specimens are seven fine Ceylonese sapphires of several colors aggregating 58 carats in weight. Two specimens are of varieties new to the Museum collection, viz.—a green sapphire from Australia, and a blue variety of tourmaline from Brazil, known as indicolite. Other gems include a fine ruby, a zircon, several topazes, and specimens of kunzite, chrysoberyl, and garnet.

A GLIMPSE OF PART OF H. N. HIGINBOTHAM HALL

The full brilliance and color of a magnificent collection of gems and jewels is brought out, as never before, by new modern types of exhibition cases equipped with fluorescent lighting. A Tiffany glass window enhances the room's beauty.

Months of study and preparation were spent in planning the new installation to provide remedies for the defects of the hall as formerly installed. The new cases were designed by the best available talent. The principal collection is placed in eight island cases. These have an exterior of English harewood matching the trim of the hall, and the glass is framed in polished bronze. Interiors are of bird's-eye maple. The gems are illuminated by concealed fluorescent lights which enhance their brilliancy. Seventeen smaller cases in the walls contain the jewelry collection and three special collections. High on the wall facing the entrance is a stained glass window by Tiffany which represents a mermaid rising from the sea.

The collections in Higinbotham Hall divide into two classifications. First, there are the materials of interest chiefly as mineralogical specimens, providing a vista of the whole range of precious and semi-precious stones as they occur in nature, together with cut specimens of the same stones. Second, there are objects whose principal interest is not so much the precious material itself as what Man has done with it through the ages of history—how he has wrought it by his arts and crafts into things of imagination and further beauty for use as personal ornament, for decoration of his dwelling places, or for mystic purposes. In the present article, therefore, the following section on the mineralogical aspects of the collection is the contribution of Mr. Henry W. Nichols, Chief Curator of Geology; and the section on gems and jewelry in their relation to archaeology and ethnology was contributed by Dr. Paul S. Martin, Chief Curator of Anthropology.

1. MINERALOGICAL ASPECTS

The gem collection is one of the most complete and valuable of any in existence. It contains nearly every known variety of precious and semi-precious stones in the finest cut examples and as crystals, cleavages, and rolled grains. It also contains examples of the better kinds of ornamental as distinguished from precious stones. Each of these is shown rough, in plain polished form, and as carvings. Supplementary collections illustrate the folklore of precious stones and show some of the native forms of gold, silver and platinum, the metals in

THE LATE HARLOW N. HIGINBOTHAM

Mr. Higinbotham was the contributor of the original and major part of the Museum's gem collection. He was a Trustee of the Museum from 1894 until his death in 1919, and was the second President of the Museum (1898-1908).

which valuable jewels are usually mounted.

Jewelers arbitrarily divide gems worn for personal adornment into two classes, precious and semi-precious. They regard the diamond, emerald, ruby, and sapphire as more valuable and attractive than other gems and class them as the only true precious stones. All other gems are classed as semi-precious. This division is arbitrary, since a semi-precious stone of high quality may easily outrank in beauty a precious stone of inferior grade. Stones rarely used for personal adornment but used for other decorative purposes classify as ornamental.

ENGRAVED LIKENESS OF A KING

The most interesting specimen among the diamonds is one which has engraved upon it in intaglio a bust of William II of Holland. This ten carat stone is pear-shaped and half an inch long. The engraving is so delicate that it has been necessary to mount a magnifying glass over it. It is the work of the famous diamond cutter, De Vries of Amsterdam, and the work consumed all his spare time for five years.

There are many blue, yellow, and white sapphires and rubies from Ceylon, Burma, Russia, Brazil, and North Carolina. There are six large star sapphires, three of which weigh more than 130 carats each, and two good star rubies. Star quartz and star garnet appear among the semi-precious stones. With the cut emeralds there are uncut crystals of the gem, among them three from Brazil, three to five inches long, of rich emerald color with many transparent portions. The semi-precious stones are present in great variety. Many display such brilliancy that one may wonder why they have been classed as semi-precious.

A NINETY-POUND TOPAZ

The collection of blue, white, pink, and golden cut topazes is unusually choice and complete. A gigantic topaz crystal which weighs 90 pounds was, when received, the largest gem topaz known (several larger ones have since been collected). Likewise noteworthy are the numerous beryls and aquamarine gems which differ from the emerald only in color. The largest is the unusually perfect Crane aquamarine which weighs 341 carats.

THE SUN-GOD OPAL

The several varieties of precious opal are given adequate representation. From a historic standpoint, the most remarkable among them is the Sun-God Opal which was kept in a Persian temple for three centuries. It is not known that it had any part in the temple ceremonies but, from the manner of its mounting and its traditional name, it may have been connected with the worship of the sun. It is cabochon cut, one inch long and three-quarters of an inch wide. It is carved to represent a human face and is mounted in a cup of gold inscribed with black figures of Oriental design. Long tapering prongs of gold extend radially from it. The resemblance to a miniature sun and its rays is striking. The opal is of Mexican origin but the carving does not have Aztec characteristics. It came from the collection of Philip Hope.

The better kinds of ornamental stones, such as alabaster, selenite, and agate, commonly used for decoration other than personal ornament, are represented both in the rough and in polished, cut, and carved form. Among the agates, the moss agates are illuminated by transmitted light which brings out well their "landscape" and other imitative patterns. A rock crystal screen shows "The Finding of Moses" elaborately carved (in Vienna) on a thin section of quartz with delicacy and in great detail; but like many medieval masterpieces it presents a gross anachronism, for Pharaoh's daughters are dressed in the costumes of medieval princesses, and in the background there appear a number of castles of types contemporary with the artist's rather than Moses' time.

2. ANTHROPOLOGICAL ASPECTS

Gems and jewelry have always been of considerable human importance and interest, whether as signs of wealth and social position, or as means of personal adornment. They therefore form a major element in anthropological studies, both for the archaeologist and the ethnologist. Practically every culture, primitive or civilized, ancient or modern, includes the use of precious stones or trinkets in one form or another.

KISH JEWELRY 5,000 YEARS OLD

The oldest pieces of jewelry in H. N. Higinbotham Hall (Hall 31) are gold from Kish, the ancient Babylonian city whose archaeology otherwise is comprehensively covered by the exhibits in Hall K. These are dated at 3000–2500 B.C., which means that they were made five or six hundred years before Abraham. Incidentally, gold is not only a favorite material for jewelry, but one of the first metals worked by man. Objects fashioned from gold are found in the earliest civilizations of the Near East.

EGYPTIAN GOLDSMITHS' ART

The Egyptian gold jewelry varies in fineness from 17 carats (70.8 per cent) to 23.5 carats (99.8 per cent). The latter grade is from the Graeco-Roman period in Egypt. This period also saw an increased use of brightly colored stones on jewelry and a decline in the goldsmiths' workmanship. Amethyst, bloodstone, plasma, garnet, onyx, jasper, carnelian, and pearls were commonly used, as well as glass imitations.

The delicacy of ancient objects created by goldsmiths of Etruria, Italy, from the 7th to the 5th centuries B.C. has rarely been equaled. During this time quality of workmanship was prized rather than display of colorful stones. The technique of applying fine gold granulations and looped or twisted wire reached its peak at this time. After the 5th century B.C. the quality of the goldsmiths' workmanship grew increasingly inferior.

JEWELRY IN EARLY AMERICA

A thousand years later (A.D. 500), and a thousand years before Columbus came westward across the Atlantic, the Peruvian Indians in South America had already discovered the process of metal working. This knowledge spread northward to Mexico,

and patterns became more intricate with the discovery of welding, alloying, casting, and annealing. Examples of metal work from Colombia are on display in the gem room. The draftsmen of Quimbaya, Colombia, used gold and an alloy of gold and copper, displaying extraordinary delicacy in execution of detail and complex patterns.

FILIGREE AND ENAMEL WORK OF INDIA

Then there is the more modern (in point of time) jewelry of India and Africa. The Indian jewelry is characterized by delicacy of workmanship, lavish use of color, and an impression of elaborate ornamentation.

The delicacy is due mainly to the filigree work in which the goldsmiths of India are masters. The flexibility of gold and silver permit the drawing of wires of these metals through increasingly small holes in a steel plate until the desired diameter is obtained. These wires are then bent into the patterns being used, and are soldered together one by one under a blow pipe.

A great deal of the colorful effect of jewelry of India is achieved by the application of enamel. Such pieces are rarely made directly for a customer but are ordered by rich jewelers. Customers select designs from a book of patterns prepared by an artist. The goldsmith then forms the article to be enameled, and afterwards passes it on to the engraver who engraves the pattern. The article then goes to the enameler who applies the colors in the order of their hardness, or power of resisting fire, beginning with the hardest.

Although precious metals and jewels are used as convenient media for keeping in handy form the fortunes of the very wealthy in India, a surprising quantity of gold and silver is worn even by the poorer classes.

"MAGICAL PROPERTIES" OF GEMS

According to ancient popular beliefs in India, certain precious stones possess special magical properties: agate will strengthen the heart, cure snake bites, and is a charm against the plague; carnelian insures victory; coral keeps away evil spirits; diamonds calm anger (instances of their use for this purpose are not unusual in modern American domestic situations—although candy or flowers are more practical for most persons). The opal preserves from malaria, but is also fatal to love, and it sows discord between the giver and the recipient; fortunately, the emerald promotes friendship and thus may be used to counteract the discord caused by the opal.

A final interesting feature of the exhibits consists of a number of pieces of massive, gay jewelry from Algeria, North Africa. Its size, if not its flashy imitation stones, puts to shame the current, splashy fashion of costume jewelry in this country.

EXHIBIT OF ORNAMENTAL STONE OBJECTS IN GEM ROOM

In center foreground is a rare and delicately carved bowl of rose quartz crystal, presented to the Museum by the late Richard T. Crane, Jr. In the center rear is a rock crystal screen upon which has been elaborately carved, on a thin section of quartz, "The Finding of Moses." A product of old Vienna, it is believed to be the largest of its kind in existence.

Expedition Obtains Material for Beach Fauna Groups

Dr. Fritz Haas, Curator of Lower Invertebrates, has returned from a two months expedition to southern California, bringing back a collection of several thousand specimens of representative species of Pacific shore animals. In addition to collecting specimens, Dr. Haas, through the courteous co-operation of the Scripps Institution of Oceanography at La Jolla and the Hopkins Marine Station at Pacific Grove, studied the Pacific beach fauna "on location" and gathered data necessary for the creation of future ecological groups planned for Field Museum. Both stations provided Dr. Haas with laboratory accommodations and active assistance in various ways.

The Palm Collection

Palm material from almost all tropical parts of the world is included in exhibits in Hall 25. Many unusual and interesting specimens, such as the so-called double coconut of the Seychelles Islands, which has the largest seed in the plant kingdom, are shown. There are also numerous entire clusters of fruit, among which those of the South American Mauritia and Orbignya palms are notable for their size. Most impressive of all for large size is the fruit cluster of a raffia palm. A case is devoted to a display of the enormous leaf stems of the larger palms in which the entire length of a leaf may be as much as forty feet. A spiny palm from Surinam and a Nipa palm from the East Indies also are shown, as is the flowering and fruiting top of a coconut palm.

Palms furnish many of the necessities of life in the tropics, yielding edible fruits such as dates and coconuts, edible oils, sago, sugar, and drinks both fermented and unfermented. The stems are used in construction of dwellings, the leaves for thatching, basket-making, hats, mate, etc., and the fibers for making ropes and textiles.

Museum Expedition Will Collect Fossil Invertebrates

An expedition to collect invertebrate fossils of the Paleozoic era for Field Museum will leave early in July. Dr. Sharat K. Roy, Curator of Geology, is in charge. The material to be sought is needed to fill, as far as practicable, some of the gaps existing in the Museum's present collection.

In adding the new material to the exhibits in Frederick J. V. Skiff Hall (Hall 37) the entire collection is to be reinstalled on an elaborate new plan. On one side of the hall the specimens will be arranged chronologically representing age relations, and on the other side there will be a systematic series showing biologic relationships. This will increase the usefulness of the collection to the serious student, and add interest as well for the casual visitor.

Models of a record size squid and octopus are exhibited in Hall M.

THE CAUSES OF COLOR, "FIRE," AND OTHER GEM QUALITIES

*By ALBERT J. WALCOTT

Man's first interest in gems arises from their beauty. Other important factors are durability, scarcity, and the dictates of oft-changing fashion.

The essential attributes of beauty in gems are color, brilliancy, luster, dispersion, transparency and, in a limited number, the phenomena of chatoyancy and asterism.

Color is accidental in many minerals, resulting from the presence of a small percentage of a foreign substance which serves as pigment. Examples of this type are: emerald, aquamarine, ruby, sapphire, topaz, tourmaline, amethyst, and rose quartz. The pigments are not integral parts of the chemical composition of these gems. In emerald, for instance, the coloring is a small amount of an oxide of chromium, distributed in very finely divided state, in the beryl crystal. The amount and uniformity of distribution of the oxide determines the quality of the green color. A stone in which the tone and intensity of the color are considered perfect, and without flaws, is very rare indeed. This is equally true of ruby and of blue sapphire.

In turquois, lapis lazuli, jade, rhodonite, and malachite, on the other hand, the colors are due to an element in each stone which constitutes an essential part of its chemical composition.

The great variety of deep rich colors in opals is produced by interference of light. In this gem the structure is such that some of the component colors of the white light which enters it are destroyed. The result is that the light from the stone which reaches the eye of an observer is the combined effect of the remaining colors.

THE SPARKLE OF DIAMONDS

The principal factor of beauty in all of the gems mentioned above is color. In these varieties brilliancy and luster are unimportant. Diamond, however, possesses these two qualities to a marked degree, and they, together with the property of strong dispersion, are the reasons for its beauty. Brilliancy and a striking luster are attributes of diamond because it possesses the property of affecting a pronounced retardation in the velocity of light. Dispersion is the property of separating white light into its component colors. A strong beam of white light passing through a prism will be thus dispersed. Dispersion in diamond is very strong and it is this property which produces the flashes of color called "fire." Along with these fascinating optical properties, diamond is the hardest of all known minerals.

Other gems which possess optical properties similar to diamond are demantoid garnet, sphene, and zircon. These, however, are much lower in the scale of hardness, and are therefore less durable.

Chatoyancy is an optical phenomenon which results from a very finely fibrous structure or from an inclusion of parallel striae. The minerals which best exhibit this property are *tiger-eye* (quartz) and *cat's eye* (chrysoberyl). When a mineral of this type is cut cabochon (i.e., with a high convex surface), a well defined, narrow band results from a concentration of reflected and diffracted light from the interior of the stone. The band lies perpendicular to the aggregate of fine fibers in the *tiger-eye* and the striae in the *cat's-eye*, and moves appreciably when the position of the stone is changed with reference to the light source.

"STAR" GEMS

The phenomenon of asterism is closely related to chatoyancy. Instead of one chatoyant band, as in the cat's-eye, there are in star sapphire, star ruby, and star quartz three chatoyant bands which intersect at angles of sixty degrees, thus producing a "six-rayed star." Asterism in garnet is most facinating. Two types of "four-rayed stars" and two types of "six-rayed stars" have been found on crystals of this mineral occurring in different localities. In the gem room of Field Museum there are two garnet spheres, each of which shows several "four-rayed stars." Each is formed by the intersection of two chatoyant bands. Two of the angles in each star are 109° 28′, and two are 70° 32′.

Beauty in all stones is brought out by proper cutting and polishing.

Most gems are minerals, and hence occur as constituents of rock formations. Exceptions are pearl, coral, amber, and jet—these are from organic sources and are not classified as minerals.

Some minerals form a great many varieties of gems—for example, beryl occurs as emerald, aquamarine, golden beryl, morganite, heliodor, davidsonite, and sixteen other varieties. The chemical composition and crystal structure are the same for all. Each of these beryl gems is recognized by its color, and the quality of color. Ruby, blue sapphire, green sapphire, amethyst sapphire, yellow sapphire, and thirty-five or more other sapphires are all varieties of the mineral corundum. Topaz not only occurs in several tones of yellow, but also of blue. It is inherently clear, transparent and colorless.

GEM VARIETIES OF QUARTZ

Quartz affords an excellent example of a mineral which occurs in many gem varieties. "Crystal" is the term generally used to designate the transparent, clear, colorless variety. Other varieties of this mineral are amethyst, citrine, rose quartz, smoky quartz, milky quartz, siderite, aventurine, and *tiger-eye*.

The above are crystalline varieties. There is also a group of varieties of quartz classified as cryptocrystalline. These consist of heterogeneous aggregates of microscopic crystal particles and fibers. Some of the better known of these varieties are chalcedony, carnelian, sard, sardonyx, chrysoprase, heliotrope or bloodstone, and the many forms of agates. An excellent assortment of gem varieties of quartz is exhibited in Case 13 of Stanley Field Hall.

Between seventy and seventy-five mineral species occur in one or more varieties of gem quality. Many of these are not widely known and receive little attention in advertising literature. Some are very rare. Benitoite, for example, a beautiful blue stone, resembling blue sapphire, has been found only in San Benito County, California.

The gem varieties of all minerals, with the exception of quartz, are limited in quantity. Specimens of gem quality are found in comparatively few of the many mineral localities of the world.

*Dr. Walcott, although not a member of the staff of Field Museum, was for some time associated with the Department of Geology in special research on gems.

Trustee Joseph Nash Field Called to Duty as Naval Officer

Mr. Joseph Nash Field, a member of the Board of Trustees of Field Museum, was called on May 29 to active service as an ensign in the United States Navy, and is currently assigned to duty in the Headquarters of the Ninth Naval District at Great Lakes, Illinois. Ensign Field is the son of Mr. Stanley Field, President of the Museum. He was commissioned an Ensign United States Naval Reserve, on November 1, 1938. Formerly Ensign Field was connected with Marshall Field and Company as Superintendent of Customer Service.

Quinine in Guatemala

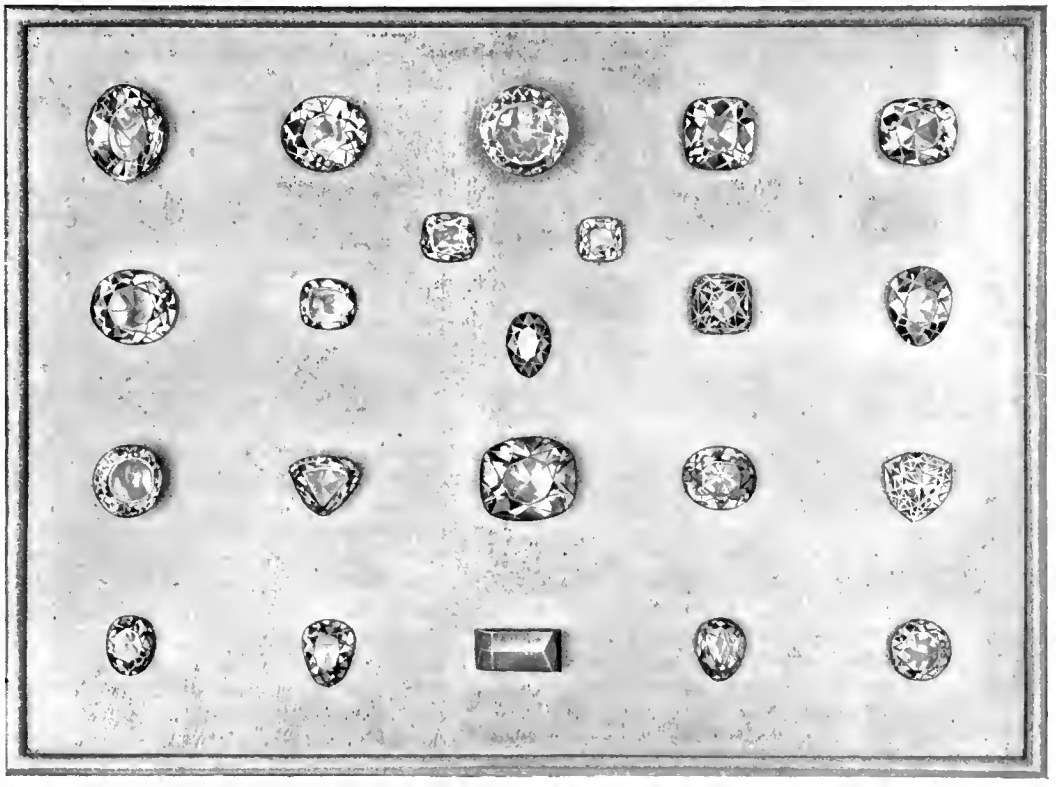
Guatemala is ably assisting in combating the problem of a possible shortage of supplies of the important drug quinine which might become unavailable from its present principal source, the Dutch East Indies, in the event of unfavorable developments in the international situation. This is reported by Mr. Paul C. Standley, Curator of the Herbarium who recently returned from a seven months expedition to that country. Quinine plantations, operated in Guatemala by United States capital, have been expanded rapidly and successfully, Mr. Standley says, and will be able to produce a supply of the best grade of quinine adequate for a large part of American medicinal and industrial demands (industrially quinine is said to be used, for example, in certain steel making processes).

Pointing to other possibilities in increasing the self-sufficiency of the western hemisphere, Mr. Standley observed further that Guatemala is operating the only commercial tea plantation outside the Orient.

AN EPITOME OF HUMAN HISTORY MAY BE FOUND IN THE STORIES OF FAMOUS DIAMONDS

(Editor's Note:—Following are a few excerpts from FAMOUS DIAMONDS, *Field Museum Geology Leaflet No. 10, by the late Dr. Oliver C. Farrington, former Curator of Geology. The complete leaflet, with 27 pages of text and 5 illustrations, is available at THE BOOK SHOP of FIELD MUSEUM, price 25 cents).*

Diamonds have long fascinated mankind. The Greek name, *adamas*, meaning "unconquerable," shows early appreciation of the diamond's properties, and in India diamonds were highly esteemed before recorded history.



MODELS OF FAMOUS DIAMONDS

(About one-third actual size)

On exhibition in H. N. Higinbotham Hall (Hall 31—the Gem Room)

KEY for identification (relative positions of names below correspond to positions of diamonds in illustration above):

KOHINOOR FIRST CUT	STEWART	GREAT MOGUL	REGENT OR PITT	STAR OF THE SOUTH
	POLAR STAR	STAR OF ESTE		
KOHINOOR RE-CUT	HOPE BLUE	DRESDEN GREEN	TIFFANY YELLOW	DRESDEN
ORLOFF	NASSAK	JUBILEE	PIGOTT	FLORENTINE
EMPRESS EUGENIE	STAR OF SOUTH AFRICA	SHAH OF PERSIA	SANCY	PASHA OF EGYPT

The high value of large diamonds is due both to their extreme rarity and their size.

Appreciation in the value of the largest diamonds, has led to records being made of their ownership and changing fortunes. Hence, many have fairly complete histories which show rulers and nations striving for their possession. Some of the basest as well as some of the noblest of human traits have been displayed to obtain and preserve them. To some extent, the history of diamonds affords an epitome of human history.

The form, size and color of a number of these diamonds are recorded in models displayed in H. N. Higinbotham Hall (Hall 31) of Field Museum. Much that is legendary is contained in accounts of the older diamonds, and it is hardly possible always to separate tradition from truth.

CULLINAN

Of all known gem diamonds, this is by far the largest. Not only did it in the rough greatly exceed in size and weight any other of gem quality known, but a much larger cut stone was obtained from it than had ever been produced before. The Cullinan diamond, as found, weighed 3,106 metric carats, or more than one and one-third pounds avoirdupois. Its dimensions were 4 by 2½ by 1½ inches. It was found in 1905, in the wall of a mine about twenty miles northwest of Pretoria, South Africa, by Mine Captain Frederick Wells. The discovery, while the source of great elation, is said to have been accompanied by fear that a purchaser could never be found for so large a jewel. The stone was named for T. N. Cullinan, President of the Premier Diamond Mining Company.

The Cullinan diamond was finally purchased by the Transvaal Colony Assembly as a present to King Edward VII. The price is said to have been $800,000. In London, owing to a defective spot at the center, it was necessary to cut it in two to obtain flawless gems. Thus the two greatest known cut diamonds were secured. The largest was a pendeloque or drop brilliant weighing 530 metric carats. The second large stone was a square brilliant weighing 309 3/18 carats. Many other flawless blue-white gems, large and small, were obtained. They were delivered to the King and Queen on November 1, 1908, and except on special occasions rest with other jewels of the English Crown in a glass case within a double cage of steel in the Tower of London.

GREAT MOGUL

About all that is known of this diamond is the account given by the French traveler and gem merchant, Jean Baptiste Tavernier, who saw it in 1665 in the possession of the Great Mogul of India. He described the stone as having the form of an egg cut through the middle. He gave the weight as 279 9/16 carats, and stated that the diamond was rose cut, round, and very high.

From other allusions by Tavernier and another traveler, Francois Bernier, we learn that this diamond had been found about 1650 A.D. in the Kollur mine on the River Kistma in India. It came into the possession of Emir Jemla, also called Mirginola, an important official of the kingdom of Golconda. Harassed by the jealousy of other officials, he sought to transfer his allegiance to the Mogul Empire and lavished the most costly gifts upon the emperor Shah Jehan. Among these was this great diamond. Shah Jehan's son later usurped the throne and imprisoned his father. The diamond thus came into the possession of the son, Aurungzeb, among whose treasures Tavernier saw it. Tavernier stated that in the rough it weighed 787½ carats. However, the cutter, Hortensio Borgio, had cut it so poorly and reduced its weight so much that the king, instead of paying him, fined him 10,000 rupees. Tavernier estimated the value of the diamond to be more than $4,000,000.

What happened to the diamond subsequently has been the subject of a vast amount of speculation. A number of English investigators have identified it with the Kohinoor, while others are equally sure it must be the diamond now known as the

Orloff. It may no longer exist. During the sacking of Delhi by the Persian Conqueror, Nadir Shah, or at his death, the diamond may have been stolen, and to escape detection may have been cut into smaller stones.

ORLOFF

The legendary history of this diamond begins with the story that it served as one of the eyes of an idol in a Brahmin temple at Seringham, India. To obtain it, it is said, a French soldier early in the eighteenth century assumed the character of a native devotee and displayed such zeal that he was appointed guardian of the shrine. The soldier took advantage of this opportunity to tear the diamond from its socket and escaped to Madras. Here he sold it for $10,000 to an English sea captain who brought it to London. After passing through several hands, the diamond reached Amsterdam, where it was seen by Prince Orloff of the Russian Court. In retirement on account of having incurred the displeasure of his royal mistress, Catherine the Great, Orloff attempted to win her back by presenting this remarkable gem. He purchased it at a price variously given as from $200,000 to $450,000. Catherine accepted the gem and gave costly presents in return, but it is not recorded that any further restoration of favor resulted. The diamond was mounted in the royal scepter and remained there during all the changes of rule in Russia. It now forms a part of the Diamond Treasure of the Union of Soviet Republics. It shows exceptional purity, and is of an agreeable, pale, bluish-green tinge. Its dimensions are: height 22 mm. (⅞ of an inch); width 31 mm. (1¼ inches), and length 35 mm. (1⅜ inches). Dr. A. Fersman, noted Russian mineralogist, asserted that this is the same diamond as that known as the Great Mogul.

KOHINOOR

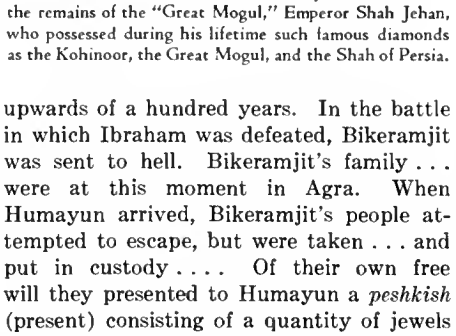
This is probably the best known of all diamonds. For centuries it has served as a symbol for supreme beauty and worth. Several diamonds surpass the Kohinoor in size, brilliancy and transparency, but none equal it in the eventfulness of its history.

Carats

The carat, as is well known, ia the unit almost universally used for expressing the weight of precious stones. The name is said to be derived from a variety of locust tree which has seeds of uniform aize formerly used for weighing gems. Until recent years, the value of the carat has varied in different countries, so that to determine the exact weight of a precious stone when given in carats, it has been necessary to know whether the weight was atated in English carats, for example, or in those of some other country or town. Thus the carat of Florence weighed 197 milligrams, and that of Madras 207 milligrams, while that of most European countries varied slightly from 205 milligrams. Fortunately an international carat was finally adopted with fixed weight of 200 milligrams (1/5 of a gram). This is known as the metric carat. In English weights this corresponds to about 3 grains. A Troy ounce contains about 155 carats. Where weights are known they are stated here in the form of metric carats, but as it is not always possible to determine what value of carat was originally used, the weight of the gem cannot always be given metrically.

The story of the Kohinoor begins in the dim past. According to tradition, it was found in the Godavery River, South India, four or five thousand years ago, and was worn by a war chief. It descended to the Rajahs of Malwar, and passed down through many generations of these rulers until A.D. 1304, when it was taken as part of the spoils of battle. Sultan Baber, conqueror of India and founder of the Mogul empire, left the following account dated A.D. 1526:

"Bikeramjit, a Hindoo, who was Rajah of Gwalior, had governed that country for



THE JEWELED TAJ MAHAL

Probably more richly adorned with precious stones than any other building in the world is this famous tomb at Agra, India. Shown above is a model exhibited in Hall L of Field Museum. The Taj Mahal contains the remains of the "Great Mogul," Emperor Shah Jehan, who possessed during his lifetime such famous diamonds as the Kohinoor, the Great Mogul, and the Shah of Persia.

upwards of a hundred years. In the battle in which Ibraham was defeated, Bikeramjit was sent to hell. Bikeramjit's family . . . were at this moment in Agra. When Humayun arrived, Bikeramjit's people attempted to escape, but were taken . . . and put in custody . . . . Of their own free will they presented to Humayun a *peshkish* (present) consisting of a quantity of jewels and precious stones. Among these was the famous diamond which had been acquired by Sultan Aleaddin. It is so valuable that a judge of diamonds values it at half the daily expense of the whole world."

Humayun was Baber's son, and succeeded him on the throne. The diamond remained one of the most valuable gems in the Mogul treasury until 1739, when Nadir Shah, the Persian conqueror, invaded India. Nadir is said to have got possession of the diamond by a cunning artifice. Nadir was informed by one of the women of the harem that Mohammed, the dethroned ruler, wore it hidden in his turban, which he never laid aside. Nadir, therefore, offered to restore his dominions, making the occasion one of grand display. During the ceremony, he artfully proposed, in token of reconciliation, to exchange turbans, an offer which Mohammed dared not refuse. Later the turban was carefully unfolded by Nadir and the long-sought-for gem rolled out. He delightedly exclaimed "Kohinoor!" (Mound of Light). In Persia the stone remained with Nadir until an assassin killed him. Then his grandson, Shah Ruhk, inherited it.

Shah Ruhk was governor of the city of Mesha, and Aga Mohammed, one of the small kings, determined to relieve him of the Kohinoor. He captured Mesha and ordered the Shah to give up his treasures. The Shah declared he had already disposed of them. Mohammed then ordered his prisoner to be tortured, a threat which caused the Shah to yield a large number of gems. But as neither the Kohinoor nor an immense ruby were among them Mohammed ordered that the Shah's head be shaved and encircled with a crown of plaster into which boiling oil should be poured. In agony the Shah surrendered the great ruby; but he still retained the Kohinoor. His health was permanently injured and he got rid of the Kohinoor soon after.

In 1751, Ahmed Shah, founder of the Afghan empire, came to his assistance and received the great diamond as the price of his aid. He left it to his son Taimur Shah who, on his death in 1793, bequeathed it in turn to his son, Shah Zaman. The latter was deposed, imprisoned, and deprived of his sight by his brother Shah Shuja ul-Mulk. He succeeded, however in retaining the Kohinoor, which he hid by embedding it in the plaster of his cell. In time the plaster crumbled and exposed a sharp point of the gem. A prison official discovered the missing Kohinoor, and delivered it to the cruel brother. It was while the Shah Shuja had it that it was first seen by an Englishman, Mr. Elphinstone, sent as an ambassador to the powerful ruler. At the reception given the English diplomat, the Shah appeared with the Kohinoor glittering on his breast. A short time after this, the Shah was expelled from Cabul, but succeeded in taking the far-famed diamond, concealed on his person. Accompanied by his brother Shah Zaman, whom he had himself blinded, he took refuge with the famous Runjit Singh, "Lion of the Punjab." Runjit soon began to extort their treasures. Thinking that the Kohinoor was in the possession of the Begum, Shuja's consort, he endeavored by starvation and imprisonment to secure the gem from her. This was continued until Shuja was prevailed upon to give up the gem for about $40,000 and a small annuity. Runjit had the stone set in a bracelet. After his death it remained in the treasury at Lahore until the annexation of the Punjab by the British in 1849. The terms of the conquest stipulated that the Kohinoor should be presented to the Queen of England, and it was brought to London. At that time it weighed 186 1/16 carats. Its form was that given it by Indian cutters centuries before. Their efforts had been chiefly directed toward saving as much of the stone as possible. In England it was recut to improve its symmetry and brilliancy. The work occupied thirty-eight days

of twelve hours each and cost $40,000. Eighty carats were removed. The stone was then placed in the jewel room of the Tower of London.

SHAH OF PERSIA

This diamond cost a man his life. On January 30, 1829, A. Griboiedov, Russian ambassador to Persia, was murdered in Teheran. Feeling in Russia ran high and war was threatened, until, to conciliate Russia, this diamond was sent as a gift to the Czar at St. Petersburg by a special Persian envoy. Russia was thus appeased and war was averted. The diamond was kept in the Diamond Room of the Winter Palace up to 1914. In that year it was removed to Moscow and in 1922 was added to the "Diamond Treasure" of the U. S. S. R.

Previously the diamond had had a long and checkered career. It is one of the few known engraved diamonds. The earliest date and inscription on the stone are "Burhan-Nizam-Shah II, 1000 years." Burhan-Nizam-Shah II was a ruler of Achmednagar, India, and the "1000 years" corresponded to A.D. 1591. A second date and inscription read: "Son of Johangir-Shah-Jehan-Shah, 1051." This refers to the Great Mogul, Shah Jehan, whose title meant "Ruler of the Universe" and the date corresponds to A.D. 1641. A third date and inscription are "Kajar-Fatliali-Shah Sultan, 1242." This refers to the then reigning Shah of Persia and the date A.D. 1824.

In 1591 the Great Mogul Akbar sent messengers to the rulers of some of the provinces of India, to inform them that they were henceforth under his control. In reply, Burhan sent an "unsatisfactory answer" and what was regarded as a "trifling" present of fifteen elephants and five gems. Angered, Akbar sent a military expedition against Burhan which conquered his city and returned with all his elephants and gems, among them this large diamond. The diamond then descended to Akbar's successor, Shah Jehan, famous as the builder of the Taj Mahal, which he constructed as a tomb for himself and his favorite wife. Its rich adornment of precious stones indicates his fondness for gems. Shah Jehan's son Aurungzeb rose against his father, thrust him into prison and usurped his throne.

How the stone was later carried to Persia is not known, but it is probable that Nadir Shah, the Persian conqueror of India, took it in 1739.

(To be concluded next month)

Lectures on Gems

Although the Layman Lectures presented on Sunday afternoons by Mr. Paul G. Dallwig have ceased for this season, it is timely, in view of the opening of H. N. Higinbotham Hall of Gems and Jewels, to point out that the autumn season, beginning on the first Sunday in November, will open with "Gems, Jewels and 'Junk.'"

THINGS YOU MAY HAVE MISSED

Famous Snake Killers

Probably most people make their first acquaintance with a mongoose by reading Rudyerd Kipling's "Riki-tiki-tavi." As a result, the Indian mongoose described in that story exclusively represents the mongoose tribe, to many persons, or at least assumes an unduly prominent position.

Actually, there are numerous kinds of mongooses (and incidentally, even though one knows it's wrong, how much more natural it would seem to write "mon*geese*" for the plural!). A representative and interesting collection of various species of mongooses, from Asia, Africa, and Madagascar, is on exhibition among the systematic series of mammals in Hall 15.

Because they are so famous as killers of poisonous snakes, there has been prevalent an idea that mongooses are immune to snakes' venom. This is only partly the case; their success in killing the snakes is largely due to their great agility—they are quicker

WATER MONGOOSE OF AFRICA

One of the group of famous snake-killers, various species of which are found in India, Africa, and Madagascar.

in striking, and sinking their teeth into the neck of the reptile, than the latter is in making its strike.

Despite its popular fame, and whatever value it might have in killing American rattlesnakes, the importation of mongooses into the United States is now prohibited. The reason they are unwelcome as immigrants is that they were introduced some years ago into the West Indies and Hawaii, but rapidly became pests, and the harm they did, to birds and small mammals, outweighed any advantages they might offer as snake killers. Mongooses feed on other small forms of life, and not merely on snakes, contrary to a widespread belief into which many persons have been misled.

PREHISTORIC BOATS AND NETS

BY HENRY FIELD
CURATOR OF PRYSICAL ANTHROPOLOGY

Excavations on the shores of Lake Neuchâtel in Switzerland have revealed that the Lake-Dwellers lived there at least 4,000 years ago. According to Dr. P. Vouga, Director of the Neuchâtel Museum, since the boats of these people were dug from tree trunks their customary form had a relatively massive stern, almost vertical in the archaic examples, later slightly curved in such a way as to facilitate boarding.

With regard to the Lake-Dwellers' nets, preserved at Robenhausen, various sizes of mesh were used and they were constructed so as to form a square, not a lozenge, as in modern nets. The nets were supported by square floats made of poplar bark and pierced with a single hole in the center. This hole was made by means of fire in the examples found by Dr. Vouga.

As weights the Swiss Lake-Dwellers used flat, ovoid stones about three or four inches in length and notched near the center. Similar weights were employed by fishermen in Lake Neuchâtel up to the middle of the nineteenth century.

A reconstruction of a fishing scene at Auvernier near Neuchâtel forms the last in the chronological sequence of dioramas in the Hall of the Stone Age of the Old World (Hall C). In Case 15, opposite the Lake-Dweller scene, are examples of nets and net sinkers excavated about fifty years ago by Dr. J. Thiessing.

SUMMER MOTION PICTURES OFFERED FOR CHILDREN

A series of six free programs of motion pictures for children will be presented at Field Museum on Thursday mornings from July 10 to August 18 inclusive by the James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures. The programs will be given in the James Simpson Theatre, and include motion pictures with sound, some in color, and one accompanied by a lecture—that of July 17, on the subject "Exploring and Collecting in Forest, Field and Stream." Mr. William Hassler, a New Jersey naturalist will tell of adventures on nature pilgrimages, and show in colored motion pictures some of his own experiences.

On three of the programs there will be animated cartoons as well as the more serious films. All six programs will begin at 10 A.M. Children from all parts of Chicago and suburbs are invited, and no tickets are necessary for admission. Children may come alone, accompanied by adults, or in groups. Following are the details of each program:

July 10—THE ADVENTURES OF CHICO (*The story of a Mexican boy*).

July 17—EXPLORING AND COLLECTING IN FOREST, FIELD AND STREAM (*Films, and lecture by William Hassler*).

July 24—SUMMER TIME IN THE NORTH WOODS (*Animals and birds*); and a cartoon.

July 31—TO THE SOUTH SEAS WITH ZANE GREY; and a cartoon.

August 7—A WESTERN VACATION IN THE RANCH COUNTRY, YOSEMITE NATIONAL PARK AND THE GRAND CANYON (*All color pictures*); and a cartoon.

August 14—TUNDRA (*An Arctic adventure*).

Field Museum of Natural History
FOUNDED BY MARSHALL FIELD, 1893
Roosevelt Road and Field Drive, Chicago
TELEPHONE: WABASH 9410

FIELD MUSEUM NEWS

EDITOR
CLIFFORD C. GREGG.....*Director of the Museum*
ASSOCIATE EDITOR
WILFRED H. OSGOOD.....*Curator Emeritus, Zoology*
CONTRIBUTING EDITORS
PAUL S. MARTIN.....*Chief Curator of Anthropology*
B. E. DAHLGREN.....*Chief Curator of Botany*
HENRY W. NICHOLS.....*Chief Curator of Geology*
KARL P. SCHMIDT.....*Chief Curator of Zoology*
MANAGING EDITOR
H. B. HARTE.....*Public Relations Counsel*

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

STAFF NOTES

The University of Chicago has conferred the degree of Doctor of Philosophy upon Mr. Sharat K. Roy, Curator of Geology. The degree is based partly upon research and publication in connection with geological and paleontological problems in Baffin Land, where he conducted investigations as a member of the Rawson–MacMillan Subarctic Expedition of Field Museum.

Columbia University, New York, recently conferred the degree of Doctor of Philosophy upon Mr. C. Martin Wilbur, Curator of Chinese Archaeology and Ethnology. The degree is a recognition of Dr. Wilbur's exhaustive research and dissertation on the subject of slavery in China during part of the Han Period.

Mr. Clifford H. Pope, Curator of Reptiles, recently made a collecting trip to the vicinity of Havana, Illinois. With the help of his wife and two sons he secured representatives of nineteen species of reptiles and amphibians. Seven kinds of turtles were found, the females of the aquatic forms being on land busily making nests; such individuals had lost all their usual wariness.

Mr. Bryant Mather, Assistant Curator of Mineralogy, left Chicago June 23 for six weeks of field work in Maryland, Pennsylvania, and Virginia. He will collect specimens of various minerals required to fill gaps in the collections of the Department of Geology.

Mr. Frank C. Wonder, of Field Museum's taxidermy staff, left Chicago last month to join an expedition to Mexico under the direction of Mr. Harry Hoogstraal, of the University of Illinois. The party will spend the summer in zoological collecting and research in the state of Michoacan. Mr. Wonder, while making a general collection of the vertebrates of that area, will devote himself especially to obtaining a representation of the small mammals. This is the fourth Mexican expedition conducted by Mr. Hoogstraal, and much of the material from his previous trips has been presented to Field Museum, or acquired by purchase.

GIFTS TO THE MUSEUM

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

Department of Anthropology:

From Grow and Cuttle, Inc., Chicago—4 pieces of Chinese ceramics, T'ang and Sung periods.

Department of Botany:

From Paul H. Allen, Balboa, Canal Zone—52 herbarium specimens, Panama; from Donald Richards, Chicago—474 specimens of mosses, Asia, Oceania, etc.; from Clyde T. Reed, Gregory, Tex.—49 specimens of marine algae, Texas; from Dr. M. J. Groesbeck, Porterville, Calif.—69 specimens of algae, California and Nevada; from Dr. W. Kiener, Lincoln, Neb.—62 specimens of soil algae, Nebraska; from Don Mariano Pacheco H., Guatemala City, Guatemala—59 photographs of Guatemalan bromeliads; from Edward Kahl, Chicago—4 samples of soy bean grits and puffs.

Department of Geology:

From O. J. Salo, Red Lodge, Mont.—8 specimens of dahlite, Montana and Wyoming; from O. C. Barnes, Los Angeles, Calif.—a Mexican onyx cross, Death Valley, California; from Willard Bascom, Golden, Colo.—2 specimens of rare minerals, Colorado; from John Butrim, Golden, Colo.—a specimen of talctriphyllite, Royal Gorge Quarry, Colorado.

Department of Zoology:

From L. F. Brown, Naples, Fla.—a ribbon fish, Florida waters; from Professor G. A. Moore, Stillwater, Okla.—12 salamanders, Oklahoma; from John W. Moyer, Chicago—an American bittern, Chicago; from J. E. Johnson, Jr., Waco, Tex.—3 snakes, Texas; from Lincoln Park Zoo, Chicago—a lynx; from Chicago Zoological Society, Brookfield, Ill.—23 birds, 2 mammals, and an anaconda; from Dr. Delzie Demaree, Monticello, Ark.—16 snakes, Arkansas; from Henry S. Dybas, Chicago—3 spiders and 141 insects, Illinois; from Instituto Butantan, São Paulo, Brazil—9 coral snakes, Brazil; from Loren P. Woods, Chicago—398 fishes, a tadpole, and a mayfly naiad, Illinois; from Clyde T. Reed, Gregory Tex.—46 fishes, coast of Texas; from Dr. Murray L. Johnson, Baltimore, Md.—salamanders, Washington state; from W. L. Jellison, Hamilton, Mont.—a flea-slide Alaska; from Adolpho Ortiz de Zarate Najera, Prov. Logrono, Spain—4 anatomica preparations, 2 microscopic slides, and 5 specimens of land shells, comprising 1 species, Spain.

The Library:

Valuable books from Peter Gerhard, Winnetka, Ill.; and from Miss Florence Hawley Elmer S. Riggs, Dr. C. Martin Wilbur Boardman Conover, and Albert B. Wolcott all of Chicago.

NEW MEMBERS

The following persons became Member of Field Museum during the period from May 16 to June 14:

Contributors

Dr. Louis B. Bishop

Associate Members

Richard H. Aishton, Mrs. Alma K Anderson, Mrs. Thorne Bovingdon, S. L Brenner, Q. P. Dorschel, Emanuel Loewenherz, Harvey Pardee, A. D. Pashkow.

Annual Members

William R. Allen, F. I. Badgley, Mrs Michael Blecker, Jr., Mrs. Arthur S. Bowes Everett Robert Brewer, J. J. Brodsky John H. Collier, P. Wilson Evans, John F Fenn, A. J. Filkins, Carl Gorr, Mrs. Harrie H. Hester, M. R. Hoffman, Robert L Holland, Max Holmburger, Thomas G Johnson, Dr. Emil Jonas, H. M. Kenyon Dr. Olga M. Latka, Mrs. Charles M. Laury Dr. Everett M. Laury, Miss Alice Stephana Lee, Arthur L. Ludolph, F. E. Ludolph, Dr George J. Musgrave, John J. Muszynski, A Huntington Patch, Mrs. Clara L. Poulson Mrs. Yvonne Sohn Revelli, Samuel A Rinella, M. Drexel Rutherford, Mrs. Clarence W. Schaaf, Joseph F. Sirotek, Peter Sissman, Sinclair G. Stanley, William Scott Stewart, Dr. F. Lee Stone, Henry Stude A. D. Swanson, Mrs. Edward G. Todt William E. VanDeventer, William A. Veto Sidney Wallenstein, George W. Wegner E. E. Willkie, Grant V. Wilson.

GUIDE-LECTURE TOURS

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

Mondays: 11 A.M., Halls of Primitive and Civilized Peoples; 2 P.M., General Tour of Exhibition Halls.

Tuesdays: 11 A.M., Animal Groups; 2 P.M., General Tour of Exhibition Halls.

Wednesdays: 11 A.M., Minerals and Prehistoric Life; 2 P.M., General Tour of Exhibition Halls.

Thursdays: 11 A.M. and 2 P.M., General Tours of Exhibition Halls.

Fridays: 11 A.M., Plant Life Exhibits 2 P.M., General Tour of Exhibition Halls

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

PRINTED BY FIELD MUSEUM PRES

Field Museum News

Published Monthly by Field Museum of Natural History, Chicago

Vol. 12 AUGUST, 1941 No. 8

EXHIBITS IN NEW HALL SHOW FISHES "AT HOME" IN THE DEPTHS OF THE SEA

By ALFRED C. WEED
CURATOR OF FISHES

The opening last month of the new Hall of Fishes (Hall O) provides Field Museum with a more attractive as well as a more instructive showing of mounted fish specimens. The exhibits of fishes formerly shared a hall of which one-half was occupied by reptile exhibits.

The large new Hall of Fishes, which results from the development of additional exhibition space on the Museum's ground floor, is now appropriately adjacent to the Hall of Marine Mammals, which in turn adjoins the Hall of Marine Invertebrates. Open space in the center of the new hall permits the exhibit to be viewed as a whole in a manner not possible formerly, and brings out the pleasing effect of the entire mass of brightly colored sea denizens. The specimens shown are for the most part entirely new. The addition of several elaborate undersea habitat groups adds much interest and beauty to the fish exhibits as now displayed.

The construction of long cases around the walls of the new hall has made it possible to arrange the specimens in a linear series that indicates the relationship of the different species to each other, and shows the parallel development of similar structures and color patterns arising from biological and ecological necessities.

Beginning our systematic series in the northwest corner of the hall, the first cases show some of the odd forms developed by the sharks, rays, and chimaeras. These primitive creatures have retained many structural characteristics of their early ancestors, with only such changes in form occurring as were demanded by the difficulties of their environment. Some became streamlined for speed, others became flattened for living on the bottom of the sea, and still others became eel-like and thus able to creep through holes in rocks.

Prominent is a life-sized model of a large thresher shark captured off the coast of New Zealand by Mr. Michael Lerner, well-known New York sportsman. It has a long tail-fin used to round up groups of small fishes for ease in feeding. A half-grown great white shark, caught in Florida waters, exemplifies one of the species definitely known as a "maneater."

A very strange shark, well known to sport fishermen, is the hammerhead, of which there are many species. Hammerheads are distinguished from ordinary sharks by eyes that are set out at the ends of long flat expansions of the sides of the head. They are shore sharks, and seek their food in shallow bays. Consequently they require ability to turn quickly so that they may avoid collisions with rocks, wharves, vessels and other obstructions, and may follow the movements of darting fishes seeking escape. They use their flat eye-stalks as vertical rudders in quick turns.

UNDERSEA MARAUDERS AMONG THE CORAL REEFS

A section of the large Bahama Islands habitat group in the new Hall of Fishes, showing hungry tiger sharks in search of their prey. Most of the reef fishes and other small creatures have taken refuge in the coral to remain there until danger seems to have passed. Many of the brightly colored and boldly patterned reef fishes are shown in other sections of this group.

Another extraordinary creature is the "angel shark" or monk fish. With its broad pectoral (arm) fins, flattened body, and wide mouth this shark resembles a ray or a skate. The angel shark is well known along the rocky eastern and northern coasts of England and Scotland where fishermen say it hides in masses of seaweed while waiting for its prey—big fishes, and birds as large as cormorants.

The frilled shark of Japanese waters is one of the oddest types known. It is caught on long lines set at a depth of more than a thousand feet in the Sagami Sea. The frilled shark is thus named because the edges of its gill openings are so large they form a sort of ruffle around its "neck." Instead of having the usual fish shape, this

THE HUGE WHALE SHARK IN THE HALL OF FISHES

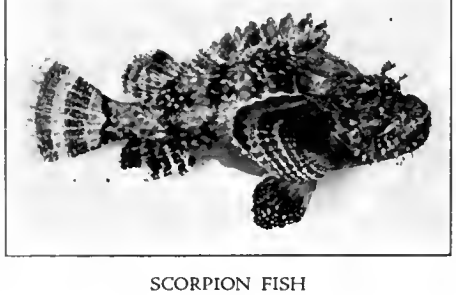
To provide a basis of comparison an artist has sketched in, to scale, the figure of a six-foot man. The Museum's specimen of this, the largest of all extant fishes, is a young male, some twenty-five feet long. Adults are known to attain lengths up to sixty feet. The tail measures seven feet in height. The mouth, nearly four feet wide, contained many hundreds of small teeth. Despite its formidable appearance, this shark is wholly unaggressive, and fails even to defend itself if attacked. It feeds only on small forms of animal life. The Museum's specimen is a gift from Spencer W. Stewart and Robert J. Sykes.

shark is very long and slender like an eel. Like most sharks it bears living young, but unlike most of its more specialized relatives the eggs are completely developed to the point of being covered by a tough shell inside which the development of the young takes place. After the eggs hatch, the young are released from the body of the mother. Frilled sharks grow to a length of about five feet. The young are about two feet long at birth.

Among the skates or rays, which may be thought of as "winged sharks," there are many strange types. All differ from sharks by having the pectoral fins so large that they can be used like wings by means of which the ray "flies" through the water. Some of them are among the fastest swimmers in the seas.

The wing spread of butterfly rays is greater than the length of the animal even including its ridiculously short tail. A stingray has on the upper side of its tail a sharp, barbed, and poisoned spine to stab any enemy. The devil fish has, on the sides of its head, a pair of extra fins which can be rolled up when traveling, or can be opened as a sort of funnel to guide food to its mouth. The sawfish can inflict terrible wounds by swinging the long broad blade on the end of its snout, armed on each side with a row of strong sharp teeth. Skates are diamond-shaped flat creatures that live on the sea bottom. They crush crabs, lobsters, and shellfish with their strong jaws; their backs are armored with sharp, thorny spines. The electric ray is in shape not unlike a skate, but it has no spines to protect itself. It would make a tasty morsel for an enemy were it not for the fact it has in its body a "battery" that produces a strong electric current to shock attackers.

One large case is devoted entirely to a half-grown young whale shark, about twenty-five feet long. This great creature was caught in Acapulco Bay, Mexico, by Messrs. Spencer W. Stewart and Robert J. Sykes, of New York, who presented it to the Museum. It was a surprise catch. The two anglers were trolling for Spanish mackerel and, naturally, using rather light



SCORPION FISH

tackle. Suddenly they saw a huge brownish shape come to the surface under their lines. Trying to jump their lures over the shark, Mr. Sykes hooked the monster's tail. When the boat captain saw what had happened he got out his harpoons and soon had a line fast to the shark. By sunset they had the shark subdued and were ready to tow it to the beach.

"LIVING FOSSILS"

Beyond the sharks and rays is an exhibit of primitive fishes sometimes called "living fossils" because they are most nearly like the fish-like creatures that flourished in the foul swamps of the Age of Coal and in ancient seas. Most of the "fishes" of the Carboniferous swamps were protected by an armor of hard scales or plates in structures essentially similar to teeth—that is, they are composed of a body of dentine covered with a shiny coating of enamel. Modern representatives of the ancient groups exhibited in this case include gars, the bowfin, sturgeons, lungfishes, and lampreys.

In the next case are fishes that retain some of the primitive structure, but which are of great economic importance. Among these is the tarpon, one of the most highly prized game fishes of the Gulf of Mexico. Pirarucu is the Brazilian name of a fish that grows to an immense size in the waters of the Amazon; stories of its dimensions and ferocity have grown so rapidly that the fish could hardly be expected to live up to them. Salmon and trout are important game fishes and valuable market species. Herring are of little importance as game or sport fishes but are so valuable for marketing that the herring fishery alone employs great fleets of ships and numbers of men.

HUGE MARLINS CAUGHT BY MICHAEL LERNER

At the east end of the hall are fishes arranged in the order of their evolutionary specialization—that is, in the degree of their divergence from their primitive ancestors. Among these are the swordfish and the spearfishes. The latter include the marlins and sailfishes.

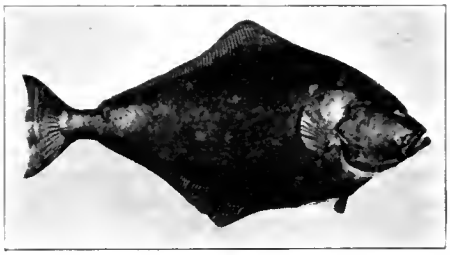
The swordfish's snout is armed with a long, flat blade of hard bone with which the fish strikes and disables its prey. Completely streamlined, it is one of the fastest swimmers in the ocean. For unknown reasons it occasionally attacks boats, striking so violently that there are records of its sword having penetrated as much as a foot of hard oak.

Spearfishes are similar in having the snout armed, but the "sword" is a round pike with a sharp point instead of a flat blade. The fish uses this bony snout as a club, not as a spear, to disable its victims. Three gigantic spearfishes in the exhibit—the Pacific black, Atlantic blue, and Atlantic white marlins—were all landed with rod and reel by Mr. Michael Lerner, and Mrs.

Lerner, who presented them to the Museum. The blue marlin weighed 537 pounds. Also presented by Mr. Lerner is a specimen of the true swordfish.

Mr. Leon Mandel, of Chicago, is the donor of specimens of the fish with the peculiarly intriguing name "wahoo," as well as a mako shark, and a devil fish. A large McGuire's sailfish from Florida waters is a gift from Mr. John W. Moyer of the Museum staff.

Several flounders, including the halibut which is the largest of this type of fish, are shown in one case. The halibut's head is so large and heavy that fishermen decapitate it to save transportation charges. This has given rise to a fantastic story that the fish's head is so horrible in appearance the government forbids bringing it to market



HALIBUT

for fear of disturbing nervous people. Nearby is shown the common sole of Europe, one of the best known of all sea fishes.

FISH'S-EYE VIEWS OF UNDERSEA SCENES

The west end of Hall O, and about half of the south side, are occupied by habitat groups representing undersea scenes in actual places where fishes have been studied, to show some of the associations of marine plants and animals. One group represents conditions on a seaward-facing rock wall of an island in Frenchman's Bay, near Bar Harbor, Maine. The fishes are shown together with sea weeds and various animals that attach themselves to the rocks. The color changes which occur in some fishes in response to the hue of their surroundings are shown. A sculpin on a bare rock with a few red sea weeds appears gray with a few red markings. Another sculpin, near a heavier patch of red sea weeds, has much more pronounced red markings. Still another, on a yellow sponge, appears in a nearly matching color, while some specimens on the sand at the bottom are a neutral gray.

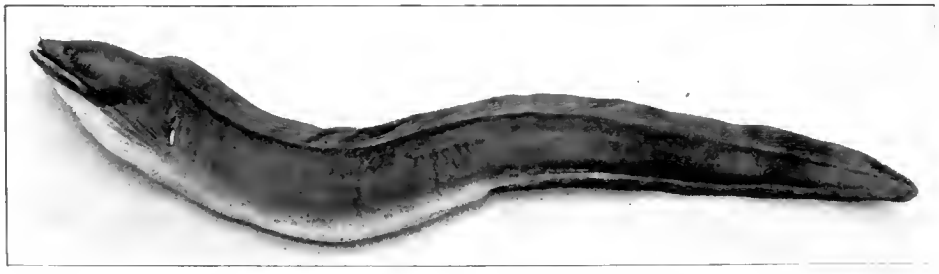
SHORE FISHES OF THE TEXAS COAST

One of the habitat groups in the Hall of Fishes. The rock-like masses on the sea bottom are "oyster lumps" built up by oysters and other mollusks on an original single shell. Only the oysters in the outer layer remain alive. These oyster lumps shelter a variety of crustaceans and other invertebrates, and are frequented by large fishes seeking food. Fishes in the group include Spanish mackerel, electric ray, shovel-nose shark, sawfish, black drumfish, red drumfish, and many others.

Another group represents conditions in southern Texas near the shore of the Gulf of Mexico, where conditions are favorable for the growth of oysters. Very young oysters swim until they find firm places to which they can attach themselves. As they grow larger, other young oysters settle in turn on them and grow upward in a clump. As this process continues the oysters in the center of the mass become smothered and die, but their shells bind the mass together and it continues to grow as new oysters lodge on the top and sides. The rounded mass thus formed is locally known as an oyster "lump."

Crabs of many kinds gather under the edges of the lumps because of the shelter and abundant food they find there. Toadfishes find convenient hiding places in holes between the shells. Red drumfishes search the outside of the lumps to catch crabs. The lumps furnish anchorage for plume-like sea weeds and bright green sea-lettuce.

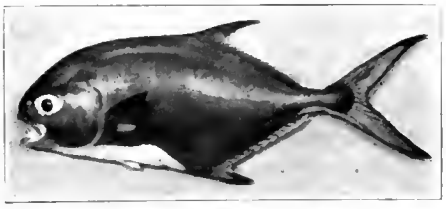
The third and largest group represents the inner edge of a coral reef on one of the Bahama Islands. It occupies the entire west end of the hall. The scene is arranged as it would appear if the Museum visitor were standing in one of the cave-like hollows of the reef, looking out toward the shore of the island. A group of hungry sharks is seen in search of food. Most of the reef fishes appear to be darting into crevices of the coral, while a band of amber-jacks swings in over the arms of a big coral to pick up whatever scraps the sharks may leave from their feast.



WEST INDIAN MORAY, A LARGE TROPICAL EEL

Specimens and data for this group were collected by the Field Museum–Williamson Undersea Expedition, members of which descended to the sea floor through a submarine tube.

The hundreds of reproductions of fishes in this hall are predominantly the work of Staff Taxidermist Leon L. Pray. Others concerned with the preparation of the hall are Staff Artist Arthur G. Rueckert, Preparator Frank H. Letl, Staff Taxidermists Julius Friesser and C. J. Albrecht, Assistant Curator Loren P. Woods, and the writer. The hall is notable for the advanced techniques employed in the installation and lighting of the exhibits, as well as for the high quality of the specimens.



PERMIT FISH, A LARGE POMPANO

FIELD MUSEUM HONOR ROLL

Now in the Service of their Country:

Theodore Roosevelt, Trustee—Colonel, U.S. Army, commanding 26th Infantry, Fort Devens, Mass.

Joseph Nash Field, Trustee—Ensign, U.S. Navy, Headquarters, 9th Naval District, Great Lakes, Ill.

Clifford C. Gregg, Director—Major, U.S. Army, Assistant Adjutant General, 6th Corps Area, Chicago.

John Rinaldo, Associate, Southwestern Archaeology—Private, U.S. Army, 51st Field Artillery, Camp Roberts, Calif.

Patrick T. McEnery, Guard—Chief Gunner's Mate, U. S. Navy Training School, Navy Pier, Chicago.

FOSSIL FISHES

By PAUL O. McGREW
ASSISTANT CURATOR OF PALEONTOLOGY

The waters of the entire world are now dominated by the group of fishes known as the teleosts, the most highly developed of the bony fishes. This order is characterized by the presence of weak, thin scales (or none at all), an internal skeleton composed entirely of bone, special modifications of fins and tail, and other peculiarities. The teleosts are far more varied than any other equivalent group of vertebrates, containing more than twenty thousand species. These fishes have only recently, speaking geologically, occupied such a dominant position—only since the beginning of Cretaceous time, a mere 120,000,000 years ago.

During the Triassic and Jurassic periods, before the heydey of the teleosts, a more primitive group of fishes, the Holostei, ruled the waters. In numerous internal characters and in the presence of heavy scales these forms were much more primitive than the teleosts. It was from some ambitious holostean that the latter arose. The Holostei were numerous and varied, but now only two are extant, the gar-pike and the bow-fin.

A third group, and one from some member of which the Holostei were evolved, was common during the geologic periods preceding the Triassic. These, the Chondrostei, or ray-finned fishes, were dominant before the more progressive holostians came into being. The Chondrostei, too, have left a few survivors, of which the sturgeon is perhaps the most commonly known.

NATURE IS TOUGH ON THE OBSOLESCENT

The three groups discussed above tell an interesting story of the value of efficient and progressive structural modification. Each of the more primitive orders enjoyed "world" domination when no other group, more efficiently adapted, was present to offer them competition. However, when new and improved structural features appeared, perhaps in a single member, that member spread and diversified so rapidly and so efficiently that the hundreds of more backward forms of the parent group were practically erased from the earth. The few survivors thus attract especial attention as so-called "living fossils."

The large division of fishes which includes the teleosts, the holosteans and the chondrosteans is known as the Osteichthyes, or bony fishes. This major group also contains other orders which are for the most part extinct. One order, of which there are a few surviving members, is the Dipnoi or lung fishes. These are of particular interest because they have functional lungs and may actually breathe air.

The crossopterygians, or so-called tassel-finned fishes, another order of Osteichthyes, were thought to be extinct until 1939, at which time a live specimen was caught off the coast of Africa. This specimen was found to be very close to some fossil forms which lived more than a hundred million years ago. From some early member of this group the land vertebrates evolved.

Of the ten or more major groups of shark-like fishes that lived during the later part of the Paleozoic era, only small remnants of two are now living. The living representatives are the sharks, skates, rays and chimaeras. The extinct types were greatly diversified and took on many forms and structures not found in any living fishes.

THE EARLIEST KNOWN FISHES

Among the most interesting of fossil fishes is a rather large group known as ostracoderms (shell-skinned or armored fishes). These were the earliest fishes to appear in the geologic record and by far the most primitive. The oldest ostracoderms are found in rocks deposited some 480,000,000 years ago during the Ordovician period. The ostracoderms differed from more advanced forms in many ways. The best known types had a body that was rather fish-like in form but which was covered with very thick, bony scales. The head was flattened and was covered by a heavy bony shield. From each side of this shield projected a sharp spur. Certain marks on the top of the head shield indicate that, as in some rays and other fishes, at least some of these early forms were protected by electric organs which dealt a strong shock to any molester. Of particular interest also is the fact that the ostracoderms had no jaws. Their mouth consisted merely of an open slit. In many cases the mouth was on the under side of the head, indicating that these fish were bottom-feeders, perhaps scavengers. The absence of jaws is an exceedingly primitive character.

The lamprey eel and the hag fish, now living, have several characters in common with the primitive ostracoderms and it is very probable that these living forms are degenerate survivors of that primitive stock.

In Ernest R. Graham Hall (Hall 38) many fossil specimens of fishes now extinct are exhibited.

A FLOWER FESTIVAL

Recently *The Chicago Tribune* carried an account of the "Fiesta de Amancaes" which is celebrated every year on the slopes of a mountain near Lima, Peru, beginning June 24 (St. John's Day).

No mention was made of the origin of the festival, and its close association with the blooming of the bright yellow daffodil- or jonquil-like flowers, the "Amancaes" (Hymenocallis Amancaes) which late in June color in golden sheen many of the slopes of Mount Amancaes with thousands upon thousands of brilliant blossoms.

Perhaps the most vivid description of the festival is that written by Stewart in the late 1830's in *Visit to the South Seas.*

His entertaining account of the merry-making is introduced by this paragraph: "The *Amancaes* is an annual festival celebrated at Lima on the 24 of June: it is something similar to our May Day; the occasion of it being the height of bloom at that time of a flower peculiar to Peru called the 'Amancaes' to gather which the citizens of every class, in the afternoon of the day, hasten, as a gala, to a spot in the vicinity of the city deriving its name as well as the festival itself from the flower which grows more abundantly there than in any other place."

After describing the appearance of the multitude and their gaiety as evidenced in talk and laughter, dancing, singing, drinking, and eating, he remarks: "Every person was decorated with the 'Amancaes' and clusters of its flowers were placed in the bridles and harnesses of the horses as well as in the hats and headdress of the riders." Clearly the inspiration of this famous Peruvian festival was and is to this day the blossoming of this beautiful plant of the amaryllis family. —J.F.M.

Tiffany Window is Gift of Mr. F. G. James

Many comments have been received since the opening in June of H. N. Higinbotham Hall (Hall 31—the Gem Room) on the beauty of the Tiffany glass window in the wall opposite the entrance to the hall. This stained glass picture, showing a mermaid rising from the sea, in colors which blend harmoniously with the general atmosphere of the hall, came to the Museum as a gift from Mr. F. G. James, of Cleveland, Ohio. Originally it decorated the wall of the personal studio of Louis Tiffany over a period of twenty-five years. In its new location it adds greatly to the tone of the Gem Room, and the administration of the Museum is deeply grateful to Mr. James.

THINGS YOU MAY HAVE MISSED

Breadfruit

Breadfruit has had an unusual literary as well as botanical and economic history. It plays an important part in such books as *Robinson Crusoe* and *Mutiny on the Bounty*. Probably most Americans and Europeans made their first acquaintance with breadfruit in reading the story of

"BREAD" THAT GROWS ON A TREE

The fruits of the breadfruit tree are a staple in the diet of the inhabitants of most South Pacific islands. The flowering and fruiting branch shown above is on exhibition in Martin A. and Carrie Ryerson Hall (Plant Life—Hall 29).

Daniel Defoe's hero on a "desert island." In recent years perhaps the story of Captain Bligh's ill-fated expedition to Polynesia, in quest of the breadfruit tree, has received more prominence, especially since a motion picture version attained wide popularity.

In Martin A. and Carrie Ryerson Hall (Plant Life—Hall 29) Field Museum has an exhibit of a flowering and fruiting branch of breadfruit. This is supplemented by a cut section of the fruit showing the edible pulp, and also some of the resinous gum obtained from the breadfruit tree and used by natives of the South Sea islands to caulk their canoes. The timber of the breadfruit tree is used by the Polynesians in various types of construction; exposure causes it to attain the color of mahogany.

Originally a native of Malaya, breadfruit became widely dispersed by the Polynesians through the islands of the south Pacific. It has been introduced in most tropical regions—a few of the trees have even been grown in Florida. Its introduction to Jamaica was the aim of Captain Bligh's expedition on the *Bounty* (1787–89); his ship had been loaded with the plants, but because of the famous mutiny did not reach its destination. However, a second expedition four years later was successful.

The breadfruit tree belongs to the mulberry family. Its scientific name is *Artocarpus incisa*. In the Museum exhibit is shown also the related, much larger, jackfruit (*Artocarpus integrifolia*) likewise used as a food.

The pulp of the breadfruit is whitish. It is farinaceous, and of a constituency between that of new bread and sweet potatoes. The fruits are round or oval in shape, and about as large as cantaloupes. The seedless variety, which is that used for food, has a rather smooth exterior. It is the principal dietary item in most of the south Pacific islands, where the fruit is usually baked in underground ovens heated by hot stones. For this purpose it is plucked before it is ripe. Various other methods of preparing it for consumption have been developed.

MORE FAMOUS DIAMONDS

(Editor's Note:—Republication of excerpts from FAMOUS DIAMONDS, *Field Museum Geology Leaflet No. 10, by the late Dr. Oliver C. Farrington, former Curator of Geology, was begun in last month's* FIELD MUSEUM NEWS. *Data on a few other diamonds are presented herewith. The complete leaflet, with 27 pages of text and 5 illustrations, is available at THE BOOK SHOP of FIELD MUSEUM, price 25 cents.)*

PIGOTT

Lord Pigott, an Irish Peer who served as Governor of Madras, India, brought this diamond of 85.8 carats to England about 1775. It is supposed to have been presented to him by an East Indian princess.

In 1818 it was sold to Ali Pasha, Khedive of Egypt. He was assassinated in 1882 by his enemy, Raschild Pasha, but before expiring ordered that the diamond should be crushed to powder in his presence and that his wife, Vasilica, should be strangled. His wife escaped, but the diamond was destroyed.

REGENT OR PITT

The tradition associated with this diamond is that it was found by a slave in India in 1701. Instead of reporting the find to his master, the slave cut his leg and in the bandage covering the wound enclosed the diamond. He gave the diamond to an English skipper for free passage to another country. The skipper threw the slave into the sea, sold the stone to a merchant for $5,000, squandered the money in dissipation, and hanged himself.

Sir Thomas Pitt, Governor of Fort St. George at Madras, bought the diamond reputedly for $100,000. Governor Pitt on returning to England in 1710 found that reports of his acquisition had preceded him, and he was accused of having procured it by unfair or violent means. He developed a morbid fear that he would lose or be robbed of the gem, and is said to have gone about much in disguise and rarely to have spent more than two nights under the same roof.

The Duke of Orléans, then Regent of France, purchased it for the French Crown in 1717. The large diamond remained among the French Crown jewels until 1792, when, with many other jewels, it was stolen from the Garde Meuble. Some weeks later an anonymous letter informed the Commune that some of the stolen objects could be found in a ditch in the Champs-Elysées. The Regent diamond was among the gems returned in this mysterious way.

Later it was for a time pledged to the Dutch Government as security for a loan to carry on the Napoleonic wars. Then, as Emperor, Napoleon is said to have had it mounted in his sword hilt. Afterwards it remained in the French treasury. It has been appraised as high as $2,040,000; a more likely valuation is $900,000.

SANCY

Although not a large diamond, the Sancy has had a more extensive circulation among the kings and queens of Europe and a longer authentic history than any other except, perhaps, the Kohinoor. Like some other famous diamonds, it was at one time the price of a man's life.

This stone was brought from the East to France by Nicholas Harlai, Seigneur de Sancy, French Ambassador to the Ottoman Court, about 1570. It was loaned or sold to Henry III of France, later returned to de Sancy. Henry IV made de Sancy his superintendent of finance and shortly after desired to borrow the diamond. The messenger entrusted with carrying the diamond was killed on the way, evidently by robbers. Knowing the trustworthiness of the messenger, de Sancy believed that in some way he had found means to outwit the robbers. Accordingly he had the body disinterred, and in the stomach the diamond was found.

De Sancy sold the diamond to Queen Elizabeth of England between 1590 and 1600. It seems to have remained among the English Crown Jewels until the widow of Charles I, Queen Dowager Henrietta Maria, presented it to Somerset, Earl of Worcester. By purchase or gift it again came to the English Crown, for we next hear of it in the possession of King James II. James is said to have sold it for $125,000 to Louis XIV of France about 1695. It then passed to Louis XV and Louis XVI.

In the famous robbery of the Garde Meuble in Paris (1792) the Sancy was among the Crown Jewels stolen, but it suddenly reappeared in 1828. In 1875 it was sent to Bombay and sold to the Maharaja of Patiala.

Field Museum of Natural History

FOUNDED BY MARSHALL FIELD, 1893

Roosevelt Road and Field Drive, Chicago

TELEPHONE: WABASH 9410

FIELD MUSEUM NEWS

EDITOR

CLIFFORD C. GREGG.....*Director of the Museum*

ASSOCIATE EDITOR

WILFRED H. OSGOOD.....*Curator Emeritus, Zoology*

CONTRIBUTING EDITORS

PAUL S. MARTIN.....*Chief Curator of Anthropology*
B. E. DAHLGREN.....*Chief Curator of Botany*
HENRY W. NICHOLS.....*Chief Curator of Geology*
KARL P. SCHMIDT.....*Chief Curator of Zoology*

MANAGING EDITOR

H. B. HARTE.....*Public Relations Counsel*

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

Assistant Curator Appointed

Mr. Donald Collier has been appointed Assistant Curator of Ethnology at Field Museum of Natural History, effective from August 1. Mr. Collier for several years has been teaching at Washington State Teachers' College, Pullman, Washington. After completing his under-graduate work at Leland Stanford University, Mr. Collier engaged in graduate work at the University of California, and at the University of Chicago, specializing in studies related to the aboriginal populations of South American countries. For the Andean Institute, New York, he conducted two expeditions to Peru.

Staff Notes

Mr. C. J. Albrecht, Staff Taxidermist, who is engaged in preparing models of whales for a separate cetacean hall in the Museum, left Chicago July 16 to visit the whaling station at Eureka, California. He will make photographic studies of whales, take color notes, and study the modeling of his gigantic subjects.

Mr. Llewelyn Williams, Curator of Economic Botany, left Chicago July 5 for a field trip of about one month's duration, in the course of which he will collect exhibition material of a few species of trees needed to complete the representation of North American woods in Charles F. Millspaugh Hall (Hall 26). Mr. Williams' work will be conducted along the northwest coast of the United States, principally in the state of Washington.

Mr. Alfred C. Weed, Curator of Fishes, will leave the Museum early in August for a stay at the United States Fisheries Commission Station at Beaufort, North Carolina, where he will study shore fishes of the Atlantic Coast. Mr. Weed has been asked by an editorial board of co-operating American ichthyologists to review the mullets of the North Atlantic region for a general account of Atlantic Coast marine fishes which they plan to publish.

Mr. Paul C. Standley, Curator of the Herbarium, and Dr. Julian A. Steyermark, Assistant Curator, visited several state parks of northwestern Illinois during a recent weekend trip and collected several hundred specimens of flowering plants and cryptogams for the Museum Herbarium.

Dr. Steyermark also recently spent a month collecting in various parts of Missouri. He has presented 3,000 specimens of plants to the Museum Herbarium.

Messrs. Emmet R. Blake, Assistant Curator, and Melvin A. Traylor, Jr., Associate in the Division of Birds, returned from a collecting trip in the southwestern United States late in July. They have been engaged in collecting specimens of birds and related material for a new exhibit planned for Hall 21.

Museum Gives Irish Antiquities To University of Chicago

Field Museum recently presented part of its collection of facsimiles of Irish antiquities, formerly exhibited in the Department of Anthropology, to the University of Chicago; the balance is destined to go to Father Flanagan's Boys' Town in Nebraska.

A formal presentation of the University's portion was made by Mr. Stanley Field, President of the Museum, to Dr. Ulrich A. Middeldorf, Chairman of the University's Department of Art.

At the University, the gold-embossed reproductions, executed by Irish craftsmen from among the major antiquities of Ireland, will be made available to scholars in the field of Irish history, art, and literature, and to others interested in Ireland's cultural evolution. The collection did not fit properly within the scope of Field Museum.

The gift was arranged through Major Clifford C. Gregg, Director of the Museum, and Dr. Tom Peete Cross, Professor of English and Comparative Literature at the University, who is an authority on ancient Irish culture.

The reproductions include the Ardagh Chalice, the Crozier of Cormac MacCarthy, the Shrine of St. Patrick's Tooth, and the Tara Brooch.

Izaak Walton League Officers Visit Hall of Fishes

Several of the officers of the Izaak Walto League of America attended the press pre view of the new Hall of Fishes, and expresse great enthusiasm for the manner in whic the installations have been made, and th extensiveness of the collection. Mr. Willia D. Cox, National Secretary of the Leagu (and President of its Chicago Chapter), an Mr. Kenneth A. Reid, Executive Secretar of the Chicago Chapter, stated that the would recommend visits to the hall in th bulletins they circulate among the League membership of many thousands.

Gem Society Visits Museum; Hears Layman Lecturer

The Chicago Metropolitan Chapter o the American Gem Society entertained th Milwaukee Chapter on the afternoon o July 20 with a visit to H. N. Higinbotha Hall of Gems and Jewels at Field Museum where Mr. Paul G. Dallwig, the Layma Lecturer, presented a special rendition o his talk, "Gems, Jewels and 'Junk.'" I the evening, Mr. Dallwig again lecture before the group at their annual banque this time on the subject "The Romance o Diamonds from Mine to Man."

The famous Sequoias or giant redwoo trees of California and the northern Pacifi coast are the subject of an exhibit in Charle F. Millspaugh Hall (Hall 26, North Amer can Woods Collection).

A FEW FACTS ABOUT FIELD MUSEUM

Field Museum is open every day of the year (except Christmas and New Year's Day) during the hours indicated below:

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

Free courses of lectures for adults are presented in the James Simpson Theatre on Saturday afternoons (at 2:30 o'clock) in March, April, October, and November.

A Cafeteria serves visitors. Rooms are available also for those bringing their lunches.

Chicago Motor Coach Company No. 26 busses provide direct transportation to the Museum. Service is offered also by Surface Lines, Rapid Transit Lines (the "L"), interurban electric lines, and Illinois Central trains. There is ample free parking space for automobiles at the Museum.

FISHES PLAY AN IMPORTANT ROLE IN HUMAN CULTURES

(A Symposium by Members of the Staff of the Department of Anthropology)

Wherever man can catch fish he always has, and fishes have played an important role in his cultures not only because they were used for food and in some cases for other utilitarian purposes, but also because they have further provided a motif for many of his artistic expressions.

At Field Museum the antiquity of man's dependence upon fish for a large part of his food, and his development of fishing techniques, is emphasized in the Hall of the Stone Age of the Old World (Hall C) by one of the life-size dioramas restoring various types of prehistoric man—that of the Swiss Lake-dwellers who are shown hauling their catch out of Lake Neuchâtel. Their nets are not vitally different in form from some of those employed by commercial fishermen today, according to Dr. Henry Field, Curator of Physical Anthropology.

Copyright Field Museum of Natural History

FISHERMEN IN SWITZERLAND 4,000 YEARS AGO

Prehistoric Swiss Lake Dwellers hauling in their fishnets on Lake Neuchatel, as depicted in one of the dioramas in the Hall of the Stone Age. Their nets and net sinkers, as shown by specimens in the Museum, were much like modern ones.

Bronze fishhooks used on the river Euphrates thousands of years ago are on exhibition in the Hall of Babylonian Archaeology (Hall K).

The use of fishes in design and decoration is exemplified by various objects exhibited in Edward E. and Emma B. Ayer Hall (Hall 2, Archaeology of Etruria and Rome); the Hall of Egyptian Archaeology (Hall J), the Hall of Babylonian Archaeology (Hall K), George T. and Frances Gaylord Smith Hall (Hall 24, Archaeology of China), and Hall D (African Ethnology).

AN EARLY CHRISTIAN SYMBOL

Mr. Richard A. Martin, Curator of Near Eastern Archaeology, makes this observation on fish in ancient times:

"Fishing played an important part in the economic life of Egypt, as well as Babylonia, because the life of its people was as intimately bound up with the great river Nile as were the lives of the Babylonians with the Tigris and Euphrates. The earliest writing of the Sumerians (who were the ancient inhabitants of Kish and its surrounding country) had a pictograph for fish. Various gods have been associated with fish in the mythology of the ancient civilizations of the Near East. The early Christians adopted the fish as a symbol from the Greek word for fish—*Ichthys*. This developed as an acrostic from the Greek name of Jesus: *I*esous *C H*ristos, *T H*eou *H Y*ios, *S*oter (Jesus Christ, Son of God, Savior)—the italicized capitals beginning each word combine to form the word *Ichthys*."

FISH IN AMERICAN INDIAN CULTURES

On the northwest coast of North America practically the entire culture of the local Indian tribes—a fairly high type of culture—is built upon and revolves around fishes and fishing, says Dr. Alexander Spoehr, Assistant Curator of American Ethnology and Archaeology. On the other hand, at Tierra del Fuego, the island lying off the southernmost tip of South America, one of the lowest of all human cultures is built upon the fish, one of the lowest of all vertebrates. Among the Indians of southeastern North America the jaws of garfishes were used to scratch children as a punishment.

Man's methods of catching fish vary in different localities, ranging all the way from casting poison in the water to stun the fish to the expensive and complicated equipment of the modern Izaak Waltons who pursue their hobby in the coastal waters and on almost every lake, river and stream of America. Even the depth bomb principle of wrecking submarines by concussion has been used for fishing, the catch being killed or stunned by hurling exploding dynamite in the water. Indians in Honduras use a simple form of the concussion method—wading in the water, they pound river bed rocks with other heavy rocks, and the shock is transmitted through the water to the fishes, stunning them sufficiently to make it possible to catch them by hand.

ASIA'S FISHING CORMORANTS

Dr. C. Martin Wilbur, Curator of Chinese Archaeology and Ethnology, contributes the following note on a most specialized form of fishing:

"Commercial fishing by means of trained cormorants is an East Asiatic addition to fishing practices. In China and Japan, cormorants, which are natural fish-catchers, are trained to bring all or part of the 'take' back to their masters, instead of gulping down each fish as it is captured. Sometimes a ring is placed around the bird's neck to make it impossible for it to swallow any but the smallest fish. The Japanese are credited with being the first people known to have used cormorants in this way, for a Chinese history, written during the 7th century of our era, describes the practice among the Japanese of that day. The Japanese method is not, however, as developed as that of the Chinese, who alone have actually domesticated cormorants, and created numerous refinements in the methods of fishing with them. On many of the canals and lakes of eastern and southern China, one may see boats and narrow rafts of the fisherman, with flocks of cormorants perched on special railings or poles, or plunging about in the water after fish."

AFRICAN FISHING PRACTICES

Dr. Wilfrid D. Hambly, Curator of African Ethnology, sketches the subject of fishing in Africa as follows:

"In African lakes and rivers are many species of edible fish which the natives catch by a variety of methods—nets, weirs, spearing, drag-baskets, lines and bait, shooting with arrows, poisoning, and using torchlights as lures to bring the fish to the surface of the water. The method used may depend first upon the season. For example, poison, made from a tuberous root, is sprinkled on the water to stupefy the fish when rivers are shallow in the dry season. It would not be effective in deep running water during the rainy season. Customs associated with division of labor between the sexes, also have a bearing. Usually, only women drag baskets against the stream, although the men may help if the current is swift. Women generally use the poison method, but men usually do all of the spearing and the shooting with arrows.

"Curious beliefs sometimes center about the fisherman's craft. The Bavenda say that a certain lake is inhabited by ancestral spirits, and no fisherman has succeeded in landing a fish from the sacred waters.

"Beliefs in the sacredness of catfish survive in Liberia and Nigeria. At Ife, in the latter, I saw a pool of sacred catfish. Because of its sacred character, the catfish was often used as the motif of designs on bronze plaques made in Benin, west Africa, where religion and art were closely connected."

EXPEDITION TO PERU

Mr. Colin C. Sanborn, Curator of Mammals, sailed from New York July 18 on an expedition to southern Peru. The principal part of his work will be the collecting of data on the life history of species of bats native to that country, as the second half of a project he began under a fellowship awarded to him in 1938 by the John Simon Guggenheim Memorial Foundation. Field Museum is also sponsor of part of his work in the field so that he may continue studies begun in 1939-40 on the Magellanic Expedition of this institution, the main task in this connection being the collection of topotypes or key specimens required for the solution of taxonomic problems of Peruvian mammals. After arrival in Peru, Mr. Sanborn will be accompanied by a student from the University of Arequipa or University of Cuzco.

In southern Peru Mr. Sanborn will visit localities not covered by the previous expedition. The fields of collecting will range from sea level at the coast to an altitude of more than 15,000 feet on the plateau above Lake Titicaca. Some work will be done in three river valleys in the eastern interior. Returning, Mr. Sanborn will make certain studies in central and northern Peru.

TWO MORE SUMMER PROGRAMS TO BE GIVEN FOR CHILDREN

The final two free programs of motion pictures for children in the summer series presented by the James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures will be given on August 7 and August 14. On the first of these dates the films to be shown are "A Western Vacation in the Ranch Country, Yosemite National Park, and the Grand Canyon," all in color pictures, together with an animated cartoon. The second of the Thursday programs will feature the film "Tundra," the story of adventures in the Arctic regions. Both programs begin at 10 A.M. Children from all parts of Chicago and suburbs are invited, and no tickets are necessary for admission. Children may come alone, accompanied by adults, or in groups from various centers.

GUIDE-LECTURE TOURS

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

Mondays: 11 A.M., Halls of Primitive and Civilized Peoples; 2 P.M., General Tour of Exhibition Halls.

Tuesdays: 11 A.M., Animal Groups; 2 P.M., General Tour of Exhibition Halls.

Wednesdays: 11 A.M., Minerals and Prehistoric Life; 2 P.M., General Tour of Exhibition Halls.

Thursdays: 11 A.M. and 2 P.M., General Tours of Exhibition Halls.

Fridays: 11 A.M., Plant Life Exhibits; 2 P.M., General Tour of Exhibition Halls.

Persons wishing to participate should apply at North Entrance. Tours are free. By pre-arrangement with the Director, special tours are available to parties.

NEW MEMBERS

The following persons became Members of Field Museum during the period from June 16 to July 15:

Contributors

F. G. James

Associate Members

Leon J. Caine, Dr. M. R. Freeland, Joseph R. Willens.

Annual Members

Herbert W. Anderson, Mrs. J. Bertley Arnold, James L. Baldwin, P. S. Billings, Louis L. Cohen, Mrs. C. B. Cook, William A. Eckenroth, Gurdon H. Hamilton, William J. Hudson, Dr. Adelaide Johnson, Dr. G. Erman Johnson, R. T. Johnson, Vilas Johnson, James A. Joy, Miss Thesy R. Lehmann, Mrs. Frances R. Macfarland, Edward J. Murnane, Mrs. Paul Newcomer, Dr. Louis B. Newman, Dr. H. C. Niblack, Harold F. North, J. R. O'Connell, Dwight S. Parmelee, Jack Pass, Samuel D. Ruby, Mrs. Clara Sandel, G. F. Sprague, Frederick A. Stresen-Reuter, Bruce W. Strong, Mrs. Kimball E. Valentine, Dr. George E. Wakerlin.

GIFTS TO THE MUSEUM

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

Department of Anthropology:

From Mrs. Richard T. Crane, Jr., Chicago —2 Pomo Indian baskets, California; from Major Oliver S. Picher, Hubbard Woods, Ill.—9 ethnological specimens, China, Hawaii, Dakota, and southwestern United States.

Department of Botany:

From Mrs. D. M. Donaldson, Aligarh, U. P., India—41 samples of plant drug materials and 162 herbarium specimens, Iran; from Museo Nacional, San José, Costa Rica—122 herbarium specimens, Costa Rica; from Donald Richards, Chicago—142 specimens of mosses, chiefly New Zealand; from United States Fisheries Laboratory, Logan, Utah—220 specimens of algae, Rocky Mountain states; from Dr. Walter Kiener, Lincoln, Neb.—20 specimens of soil algae, Nebraska; from L. J. King, Chicago—108 specimens of algae, Illinois, Indiana, and Michigan; from Dr. V. O. Graham, Chicago—102 specimens of fleshy fungi, Illinois; from W. A. Daily, Cincinnati, Ohio—105 specimens of algae, Ohio, Indiana, and Kentucky.

Department of Geology:

From Dr. R. F. Barton, Manila, P. I.—12 specimens of tektites, Philippine Islands; from Miss Sherry Wagner, Northfield, Ill. —a specimen of pyrite and marcasite, Illinois; from Mrs. Clarice Thacker, Woodstock Ill.—6 fossil bones, Illinois; from Dr Benedict Gresky, Chicago—4 white beryls

Department of Zoology:

From Boardman Conover, Chicago— 522 bird skins and a bat, Mexico; from Andrew Sorensen, Pacific Grove, Calif.— species of California marine bivalves in un usually large specimens, California; from Museum of Vertebrate Zoology, University of California, Berkeley, Calif.—4 kangaroo mice, Nevada; from Loren P. Woods Chicago—1,642 fish specimens, Illinois from C. M. Barber, Hot Springs, Ark.— 4 snakes and 4 lizards, Arkansas; from J. E Johnson, Jr., Waco, Texas—8 snakes, Texas from P. D. Armour, Lake Bluff, Ill.— milk snake, Illinois; from Gordon Gunter Corpus Christi, Texas—7 fish specimens Copano Bay, off Texas coast; from Dr J. D. Barger, Linton, N. D.—a wild-ca skin, Saudi Arabia; from Dr. C. S. Smith San Marcos, Texas—2 snakes, Texas; from Chicago Zoological Society, Brookfield, Ill —3 mammals and one reptile; from Dr James G. Needham, Ithaca, N. Y.—13 dragon flies, Chile, West Indies, and Texas

The Library:

Valuable books from Marquess Hachisuka Tokyo, Japan; from American Museum o Natural History, New York; from Dr Henry Field, Washington, D.C.; and from Rupert Wenzel, Chicago.

MEMBERSHIP IN FIELD MUSEUM

Field Museum has several classes of Members. Annual Members contribute $10 annually. Associate Members pay $100 and are exempt from dues. Sustaining Members contribute $25 annually for aix consecutive years, after which they become Associate Members and are exempt from all further dues. Life Members give $500 and are exempt from dues. Non-Resident Life Members pay $100, and Non-Resident Associate Members $50; both of these classes are also exempt from dues. The Non-Resident memberships are available only to persons residing fifty miles or more from Chicago. Those who give or devise to the Museum $1,000 to $100,000 are designated as Contributors, and those who give or devise $100,000 or more become Benefactors. Other membershipa are Honorary, Patron, Correaponding and Corporate, 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 memberahipa will be aent 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.

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 for federal income tax purposes.

Endowments may be made to the Museum with the provision that an annuity be paid to the patron for life. These annuities are guaranteed against fluctuation in amount, and may reduce federal income taxes.

PRINTED BY FIELD MUSEUM PRESS

Field Museum News

Published Monthly by Field Museum of Natural History, Chicago

Vol. 12 SEPTEMBER, 1941 No. 9

CROCODILES, PERILOUSLY COLLECTED BY HUNTERS IN CANOE, NOW EXHIBITED

BY KARL P. SCHMIDT
CHIEF CURATOR, DEPARTMENT OF ZOOLOGY

The lifelike representation of reptiles for museum exhibition was for a long time a major problem of modern taxidermy. This craft, as applied to the exhibition of birds and mammals, was raised to the level of a genuine art by Carl E. Akeley and other critical museum workers in the 'nineties. During subsequent years there was a great development of museum exhibition in the direction of the habitat group, a portrayal of finely mounted individual animals in their natural environment, reproduced with artificial vegetation and with a painted landscape background. In this kind of exhibit, which has steadily increased in popularity, reptiles and amphibians had little place because of the difficulties of preparing mounted specimens or models in any way comparable to the results obtained with bird and mammal skins.

The solution of the problem of making wholly lifelike exhibition models of reptiles by the use of celluloid as a casting medium was accomplished by Mr. Leon L. Walters in the laboratories of Field Museum. Staff Taxidermist Walters' early experiments proved that celluloid, dissolved to form a thick liquid and mixed with the pigments desired, dried to form a material exactly resembling reptile scales. By the early nineteen-twenties, this technique of reproducing reptiles as celluloid models for museum exhibition had been perfected; it is now generally referred to among museum workers here and elsewhere as "the Walters Process."

The opportunity afforded by a reorganization of the Museum's zoological divisions in 1922, with a newly established separate Division of Reptiles, was made the occasion for an expedition to the Central American tropics in which Mr. Walters and the writer were associated. It was desired to apply the new exhibition techniques to larger reptiles, and especially to a habitat group.

For the habitat group we chose the American crocodile, widespread in Central America (the same species is found also in the West Indies and in southern Florida). We were extremely fortunate in finding for our crocodile hunting a locality of great biological interest, where, at the same time, the actual collecting of the crocodiles could be efficiently undertaken.

CROCODILES ON LAKE TICAMAYA, HONDURAS

Habitat group of great American reptiles, as now exhibited in Albert W. Harris Hall (Hall 18). The collecting of these animals was an outstanding adventure in the careers of Chief Curator K. P. Schmidt and Taxidermist L. L. Walters.

Lake Ticamaya, a shallow but good-sized body of water in the Ulna River valley in Honduras, proved to be a veritable lake of crocodiles. Sitting in concealment on the bank, we could count as many as seventy-five heads of crocodiles floating at the surface of the water in a single bay, and the glowing red eyes showed on every hand at night when we set forth with the dugout canoe and jacklight. The picturesque shores, wooded with the gigantic cohune palm and hardwood trees hung with Spanish moss, are overgrown with cat-tail in the bays, but have sand and gravel or even rocky banks on the projecting points on which the crocodiles haul out to sun themselves, sometimes evenly spaced in a row.

The water of Lake Ticamaya is filled with microscopic plant life to such a degree as to give it the consistency and color of pea soup. The extremely soft mud at the bottom, probably formed by the death of this plant material, gives off marsh gas. This, together with oxygen given off by the living algae, rises to the surface and forms a bubbly scum, which is driven by the wind to lee shores and accumulates as varicolored mats, often in regular zones of green, pink, and brown, parallel to the shore.

These singular conditions determine the method of hunting crocodiles in common use at the lake. The ooze at the bottom gives off gas at the slightest touch, and a slowly moving submerged crocodile can accordingly be followed by means of tracks of persistent bubbles which register on the surface above him every footprint of the hind feet below. A fair estimate of the size of the crocodile can be made from the breadth of his bubble trail. With this means of following individual crocodiles, it is possible to get into advantageous position for harpooning them.

We found it necessary to hunt early in the morning before the forenoon wind disturbs the surface of the water. With harpoon, .22 rifle, 30-caliber Winchester in case of trouble, and single paddles, we set out from our camp to one of the upper bays on the lake. There is no trouble in finding a fresh crocodile "bubble trail," as the shy crocodiles attempt to walk away on the bottom when anyone approaches. The harpooner stands in the front of the dugout, and the paddler closely follows

the trail. Trial casts of the harpoon frighten the crocodile, and he dashes off under water, leaving a shooting trail of bubbles. All the strength of the paddler is required to keep up with him.

HUNTER OVERBOARD AMONG "CROCS"

With continued pursuit, the crocodile invariably gives up his under-water tactics and swims at the surface. The canoe is then driven forward, and the harpoon cast into the crocodile's back. It is then well to pay out the rope rapidly, to avoid possible attack. With fifty feet of rope, the crocodile can be played like a gigantic fish; he soon tires but it proves impossible to tow him with the canoe. It is necessary for one of us to strip and step into the waist-deep crocodile-filled water. With the rope over his shoulder and a steady pull the hunter can then land the animal on a rocky portion of the shore. We found that our largest specimens could be killed by a vertical shot into the neck with the .22 pistol.

Obtaining the specimens is only the beginning—then follows the arduous work of mold-making. The task of making plaster of Paris molds of the larger crocodiles occupied a large share of the three weeks we spent at the lake, and had to be done under difficulties. The body of the freshly killed specimen (the largest weighed more than half a ton) had to be transported to the nearest beach which we could reach with our barrels of plaster. The posing of our reptilian monsters was an important matter, since the positions chosen were necessarily final. The algae-filled water of the lake could not be used in mixing the plaster, and shallow wells had to be dug near the lake shore, into which clear water filtered through the sandy mud.

A RACE AGAINST TIME

We applied the plaster of Paris in two layers: a thin inner one of smooth plaster was followed immediately by a heavy outer one laid on with masses of tow soaked in plaster. Working together at top speed, it took us until past midnight of the day on which our specimen was killed to complete the work for the body alone, and on the following morning there was a continued race between the application of the plaster and the advance of decomposition.

The packing of these large shells of plaster for transportation to Chicago was in itself a difficult problem. The largest pieces of mold were six feet in length. We purchased rough lumber at the mill in San Pedro, hauled it out by ox-cart, and built three large packingboxes, each six and a half feet long, three and a half feet wide, and a foot and a half deep. Frames of straight green poles were fitted inside these boxes, and the molds were lashed inside the springy frames. This arrangement, devised largely by Mr. Walters, proved so effective that the huge plaster shells of our four complete molds of crocodiles reached the Museum without damage.

The final construction of the crocodile models in the Museum required more than a year's work by Mr. Walters. These specimens, recently reinstalled in the Hall of Reptiles (Albert W. Harris Hall, Hall 18) include an eleven-footer in the typical lazy pose of a sunning crocodile; a specimen with mouth wide open, also a familiar sight at the lake; a juvenile specimen in the remarkably dinosaur-like pose taken when getting on its feet preparatory to walking into the water; and a floating specimen with only the upper surface of its head exposed. Something of the wealth of bird life at the lake is shown in the foreground by a long-toed jacana walking on the floating scum, and a snake bird sitting in characteristic pose on a dead limb. The panoramic background by Staff Artist Arthur G. Rueckert reproduces the dense vegetation of the shores thronged with sunning crocodiles. In the sky are seen egrets, and the ever present wheeling vultures.

SPECIAL NOTICE

All Members of Field Museum who have changed their residence, 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.

PALEONTOLOGICAL EXPEDITION COLLECTS RARE SPECIMENS

Several specimens of one of the earliest large mammals to walk the earth—the rare *Coryphodon*, a creature about the size of a hippopotamus, but in its special characteristics unlike any animal living today—have been discovered by the Colorado Paleontological Expedition of Field Museum. This is revealed in a recent report from Mr. Bryan Patterson, Assistant Curator of Paleontology and leader of the expedition.

Mr. Patterson, and his associates—who include James H. Quinn of the Museum staff, John and Robert Schmidt, and Ellsworth Shaw, all of Homewood, Ill., and Edwin Galbreath, of Ashmore, Ill.—have completed reconnaissance, and are now in the midst of excavating operations to remove the specimens they have located from the rocks in which they are deeply and firmly imbedded. The sites where work is being conducted are on the western slope of the Rocky Mountains in Colorado.

The *Coryphodon* lived in the early Eocene period, or about 50,000,000 to 60,000,000 years ago. It has no modern relatives. Until now, there have been only three reasonably complete Coryphodon skeletons in the world. Mr. Patterson's report indicates that Field Museum will have an extensive collection including several complete skeletons and a number of skulls, leg bones, jaws, vertebrae, etc.

The rare animal is a member of the Pantodonta, a group comprising only very primitive types of hoofed mammals. It was overtaken by extinction even before the end of the Eocene period, which was the earliest part of the Age of Mammals. The bones indicate that the animal resembled a hippopotamus only in size and stocky build—it was extremely short in stature for its length, and its head was disproportionately large for its body.

Specimens of various other prehistoric animals that inhabited Colorado millions of years ago are also being collected.

RAYMOND FOUNDATION FILMS OFFERED FOR CHILDREN

The James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures will present its autumn series of nine free motion picture programs for children on Saturday mornings beginning October 4. The first program, "Indian Lore, Life and Culture," features, in addition to motion pictures, a personal appearance by Charles Eagle Plume, who is partly Indian himself. He will tell the children the story of the life of the original Americans. He will wear tribal costumes and illustrate his subject with various dances.

The complete schedule of the programs through November will appear in the next issue of FIELD MUSEUM NEWS. All are to be presented twice, at 10 and 11 A.M., in the James Simpson Theatre of the Museum. Admission is free, and no tickets are necessary. Children from all parts of Chicago and suburbs are invited, and they may come alone, accompanied by adults, or in groups from schools and other centers.

Mineralogist Completes Expedition; Enters Service of U.S

Mr. Bryant Mather, Assistant Curator of Mineralogy, returned on August 8 from six weeks spent in eastern states collecting mineral specimens. He visited many areas from which Field Museum's collections lacked specimens. Of these, certain regions in eastern Pennsylvania, New Jersey, Virginia, and northern Maryland yielded interesting and valuable collections.

Mineralogists from Baltimore, Washington, and Philadelphia museums, from Johns Hopkins and Princeton Universities, and from Bryn Mawr College generously gave their time, information, and assistance in field collecting. Approximately 1,000 specimens were obtained.

Mr. Mather is now on leave of absence from the Museum to serve an emergency appointment in a civilian capacity under the direction of the Corps of Engineers of the United States Army. He reported for assignment at The Concrete Laboratory, West Point, New York.

NEW HUICHOL INDIAN EXHIBIT

By ALEXANDER SPOEHR

ASSISTANT CURATOR OF AMERICAN ETHNOLOGY AND ARCHAEOLOGY

Field Museum's collection illustrating Mexican ethnology has recently been augmented by an important gift of Huichol Indian material, presented by Mr. Henry J. Bruman, Professor of Geology, Pennsylvania State College. The more significant of these specimens have been installed in the Hall of Mexican Archaeology and Ethnology (Hall 8), Case 23, where they make a colorful addition to the exhibits.

The Huichol Indians live in the tall and rugged mountains of the northwestern part of the state of Jalisco. The wildness of their country greatly impressed the early Spanish Jesuit chronicler, Father Ortega, who said of the Huichol homeland: "It is so wild and frightful to behold that it, more than the quivers of its warlike defenders, took away the courage of the conquerors, because not only did its ridges and valleys appear inaccessible, but the extended sphere of towering mountains and peaks perplex even the eye." Yet despite the natural defenses enjoyed by the Huichols, they finally succumbed in 1722 to the Spanish conquerors. Franciscan missionaries followed, a number of churches were built, and the Huichols were nominally converted to Catholicism. However, missionary work was later abandoned, the churches fell in ruins, and the Huichols continued the practices of their native religion, which nevertheless assimilated numerous elements of Christianity.

QUITE PRIMITIVE EVEN TODAY

This Indian culture was also greatly affected by the introduction of metal tools and of domestic animals such as cattle, sheep, and horses. Yet even today, with modern Mexican civilization surrounding their mountain fastness, the Huichols remain a relatively primitive folk, living in isolated households, and growing crops of corn, beans, and squashes in small fields scattered over the mountain sides. There are today about four thousand Indians in the tribe.

Of greatest interest in the new exhibit are the ceremonial objects and the textiles. The former consist mainly of votive bowls and ceremonial arrows. The bowls are sections of gourds decorated with animal figures made of colored glass beads and beeswax, and used as offerings. The arrows represent a more common feature of Huichol ceremonial life. When an Indian prepares for a noteworthy event, he makes a decorated ceremonial arrow and asks for protection or a favor from the gods. The arrow is thought to act as a messenger to the deities.

Among the textiles are included belts, bags, head bands, men's dress neckerchiefs, and a woman's poncho cape. Embroidery is a favorite decorative technique and striking designs are carried out with care and effectiveness. Two water color sketches, executed by Miss Margaret Ross, Volunteer in the Department of Anthropology, illustrate the Huichol method of wearing headbands and the manner in which women wear their dress capes. Two additional sketches by Miss Ross are mounted with a collection of modern Aztec specimens, which have been reinstalled in the same case.

BENEFITS OF MUSEUM EXTENDED TO CRIPPLED CHILDREN

By JOHN R. MILLAR

CURATOR, N. W. HARRIS PUBLIC SCHOOL EXTENSION

In recent months, ten hospital schools have been added to those receiving the portable museum cases prepared and circulated by the N. W. Harris Public School Extension of Field Museum. The hospital schools are branches of regular or special public schools. They represent a successful attempt to provide continuing instruction for children of school age who, through misfortune, must undergo long hospitalization for the treatment of various non-infectious maladies such as rheumatic heart, chorea, or crippling deformities of various kinds.

Instruction in hospital schools under best conditions is carried on under great difficulties. In many instances it requires individual bedside teaching. Under such circumstances, the Harris Extension cases, in spite of their claim to portability, seemed to lack utility as teaching aids or material for instruction. To adapt the use of the cases to hospital conditions, a tubular metal stand with large, free-rolling casters was designed, and a sample made by the Museum. It supports the usual loan of two school cases at bedside or wheel-chair height, and provides an almost effortless mobility for the cases, permitting them to be moved with ease from place to place in the hospital school. With the exception of one, where the kind of patient permits more formal classroom instruction, all the hospital schools receiving the Harris Extension cases have acquired this type of stand.

Courtesy of Board of Education Photo Laboratory

MUSEUM REACHES OUT TO HANDICAPPED YOUNGSTERS

Scene at Sarah Morris Children's Hospital (a division of Michael Reese Hospital) where traveling exhibition cases like that shown in center are now being sent on regular schedule by the N. W. Harris Public School Extension of Field Museum.

This contribution of the extension services of Field Museum to the education and welfare of handicapped children, who may be required to lead a cloistered existence the rest of their lives, will be regarded with satisfaction by the several thousand Chicagoans and others who support the Museum's activities.

Chicagoans, Please Note!

From a resident of Bluefield, West Virginia, who recently visited Chicago, the Director of the Museum has received the following letter:

"Just a note to tell you that the largest value received for twenty-five cents was the admission paid to see the Chicago Field Museum. The vacation spent in Chicago area by myself, wife, and son Jim was the happiest we ever experienced."

5,000 BOLIVIAN BIRD SPECIMENS RECEIVED AT MUSEUM

Field Museum recently received an interesting collection of some 5,000 birds from Bolivia. They were assembled by Señor Francisco Steinbach, of Cochabamba, who carries on the tradition of exploring the animal world of his country established many years ago by his father, José Steinbach. The collection is particularly rich in birds of the family of oven birds (not related to the North American oven bird). Also well represented are humming birds and fly catchers.

These specimens, which fill an important gap in the Museum's geographical coverage of South America, will be of great value in comparisons and studies on collections recently made by the Magellanic Expedition and other material recently received from Paraguay, Peru, and Ecuador. —R.B.

THE MITE AND TICK MENACE

By WILLIAM J. GERHARD
CURATOR OF INSECTS

That certain small creatures now called insects, mites, and ticks are responsible for much of the discomfort of man's outdoor life must have been as true and as apparent before the dawn of history as now. Only during the past fifty years, however, has it been discovered that a number of these annoying pests serve as carriers, transmitters, or intermediate hosts of viruses,

Photo courtesy of National Institute of Health, Rocky Mountain Laboratory, United States Public Health Service

A "PUBLIC ENEMY"

The Rocky Mountain fever tick, cause of a dangerous disease, the mortality rate from which has recently focused upon it the attention of the medical profession. A romantic treatment of the research upon it was presented in the popular novel "Green Light" by Lloyd C. Douglas.

Female (top) and male

bacteria, and protozoans that often cause sickness or even fatal diseases in man and animals. Of the disease-transmitting insects, lice, mosquitoes, flies, and fleas are the most familiar, but some of the mites and a number of ticks are also a menace.

Mites are mostly minute, bean-shaped or sack-shaped creatures with unsegmented bodies. The members of two of the thirty or more families of mites are comparatively large, somewhat flat, and are generally called ticks. With few exceptions, all mites have four stages in their development: the egg, larval, nymphal, and adult stages. Like the spiders, which are close allies, most mites have four pairs of legs in their adult stage.

Of the many modes of life of these abundant and widely distributed little creatures, those that affect the interests and health of man are the most noteworthy. Among them are the mites that are predaceous on injurious insects; those that are destructive to plants, trees and food products; and those that as parasites attack man and animals.

The mites destructive to vegetation are the kinds that feed on the sap of fruit trees and clover, the leaves of beans (red spiders) and other economic plants, or on bulbs and garden flowers. The cheese, ham, and flour mites, which bring forth their young alive, are troublesome pests in Europe and North America. Farm animals often are the victims of species that have parasitic habits. Some of them are the scab, mange, and follicle mites that attack cattle; and the feather, scaly-leg, and depluming mites that live on poultry and other birds. Long-known parasites of man and domestic animals are the itch mites. They burrow into the skin and cause intense itching which, if not promptly treated with a sulphur ointment, develops into a disease called scabies or "barber's itch."

TEMPORARY PARASITES ON MAN

In the eastern half of the United States there are mites that often prove very troublesome as temporary parasites on human beings. They are known as red bugs or chiggers. In their minute larval stage they crawl generally on the lower half of a person's body and attach themselves by means of their specialized mouth parts. In a few days they become engorged with blood and nymph, and drop off. However, much irritation, severe itching, and more serious complications often result from their attacks. The adult red bugs are predaceous mostly on insects. Harvest or grain mites can also be regarded as temporary parasites upon man. Normally they are predaceous on insect larvae that feed on farm products, but harvest hands and those who handle insect-infested farm products are sometimes attacked by them. A day or two afterwards, their temporary host may have a widespread rash accompanied in severe cases by fever, nausea, and headache.

The members of the two families of mites generally called ticks include about fifty different kinds that live in the United States. All of them are external parasites on vertebrate animals. Five are known, and more are suspected as transmitters to man of a number of disease-producing organisms. Some species feed and pass their different stages on one host; others require two, three, or more hosts for their full development. Their food consists wholly of blood and nymph, but, when none is available as is the case generally during the winter, they can live without nourishment for many months. So well fitted are most ticks for their blood-sucking habits that care must be taken in removing them, to prevent the mouth parts from separating from their bodies and remaining anchored in the skin of their hosts.

That ticks can be the vectors or transmitters of disease organisms was demonstrated for the first time in 1893. Two investigators, Messrs. T. Smith and F. L. Kilbourne, of the United States Department of Agriculture, discovered that a particular species of tick in the southern states was the vector of a protozoan (a single-celled animal) that produces a serious and often fatal disease in cattle and other domestic animals in Texas and adjoining states.

These Texas fever ticks, as they are called, are single host parasites. They pass their different stages on one animal, finally mating and dropping to the ground where the females lay their eggs. As there is no successful way of curing the afflicted animals, the best method for checking the disease is to kill the ticks on their hosts, and to prevent the parasites from spreading into other parts of the country by quarantine regulations. In this manner the pests have been greatly reduced in number, and the area of their distribution has been restricted. In Europe other species of ticks have been found to be responsible for a disease similar to the Texas or redwater fever.

THE SPOTTED FEVER TICK

The discovery that a certain kind of tick was indirectly responsible for the red-water fever which was once widespread among cattle in Texas led investigators to believe that some of the diseases of man might be due to the feeding habits of similar parasites. As a result of the investigations of the late Dr. H. T. Ricketts and his associates, it was ascertained in 1906 that a species of tick was the transmitter of an organism that caused the sickness and death of many persons in the northern Rocky Mountain states. Later, careful studies and experiments made by the National Institute of Health (United States Public Health Service) in its Rocky Mountain Laboratory at Hamilton, Montana, and by investigators of various other institutions, disclosed the intricate life-history of the Rocky Mountain spotted fever tick and its surprising status as a disease vector.

This important parasite proved to be a three-host tick that requires two to three

FIELD MUSEUM HONOR ROLL

Now in the Service of their Country:

Theodore Roosevelt, Trustee—Colonel, U.S. Army, commanding 26th Infantry, Fort Devens, Mass.

Joseph Nash Field, Trustee—Ensign, U.S. Navy, Headquarters, 9th Naval District, Great Lakes, Ill.

Clifford C. Gregg, Director—Major, U.S. Army, Assistant Adjutant General, 6th Corps Area, Chicago.

John Rinaldo, Associate, Southwestern Archaeology—Private, U.S. Army, 51st Field Artillery, Camp Roberts, Calif.

Patrick T. McEnery, Guard—Chief Gunner's Mate, U.S. Navy, Training School, Navy Pier, Chicago

John Syckowski, Guard—Chief Commissary Steward, U.S. Navy, 9th Naval District, Great Lakes, Ill.

years for its development from the egg to the adult stage. Its range of distribution is now known to extend from New Mexico and Arizona northward to British Columbia and Alberta. For a week or two the larvae feed on small mammals, primarily rodents, and, after becoming engorged, they drop to the ground, molt, and change into the nymphal stage. The nymphs likewise live on small mammals and they finally also leave their hosts, molt, and become adult ticks. The adult parasites in turn feed mostly on large mammals, and it is in this stage that they attack man. Large mammals seem to be immune to the results of these tick bites, but man, monkeys, and guinea pigs are not. The human death rate from western spotted fever varies in different localities from 5 to 85 per cent.

The organisms that the Rocky Mountain fever tick transmits are called Rickettsi bodies which some authorities believe to be a virus. Rickettsi bodies are found in a number of species of small mammals and they serve as natural reservoirs for the virus. By means of their eggs the ticks can pass the virus to the next generation.

OTHER DISEASES FROM TICKS

Recent investigations have disclosed the fact that the western spotted fever tick and four allied species are at least partly responsible for the transmission of four other organisms which cause the diseases known as tick paralysis, tularaemia, relapsing fever, and Colorado fever.

It is now well known that spotted fever occurs not only in the west, but also in the middle Atlantic states, especially Maryland, Virginia, and North Carolina. The eastern strain of this disease seemingly is less virulent than the western, the fatality of authentic human cases averaging about 20 per cent. It was only in 1931 that the American dog or eastern wood tick was found to be the vector of the spotted fever virus in the east.

The American dog tick is a three-host parasite that apparently has an irregular distribution in the United States and southern Canada. During its different stages it feeds on a variety of domestic and wild animals. It is commonly found on dogs and it often attaches itself to man. In Illinois in 1939 two human cases of spotted fever were officially reported and believed to be the results of the bites of dog ticks that had fed on two infected sheep. Besides being a vector of the spotted fever virus, the common wood or dog tick also transmits the bacteria causing tularaemia, a disease common in rabbits.

There is sufficient evidence to prove that the attacks of a number of species of ticks both in America and abroad have serious and often fatal results to animals of economic importance, and to man. All tick bites, therefore, should be given prompt and careful attention.

EXPEDITION TO ECUADOR

Mr. Donald Collier, recently appointed Assistant Curator of Ethnology, is leaving September 1 to spend five months in Ecuador supervising for the Institute of Andean Research a program of archaeological investigations in which Field Museum is collaborating. The project is sponsored by the Co-ordinator of Commercial and Cultural Relations Between the American Republics.

Although little archaeological work has been done in Ecuador, extensive prehistoric remains are known to exist, and it is expected that an archaeological survey will yield important results. The expedition hopes to gather information which will tie up the archaeology of Ecuador with that of Peru to the south and Colombia to the north.

Ecuador was conquered by the Incas in the 15th century, and the most recent archaeological remains there pertain to the Inca civilization. But there is also evidence, in the form of elaborate pottery, gold and silver objects, and intricate stone carving, that important civilizations existed in Ecuador before the coming of the Inca conquerors from the south. It is the aim of the expedition to study these earlier cultures and to attempt to relate them to early Indian civilizations that flourished in other parts of the Andes.

Change in Visiting Hours Begins September 2

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 2, the day after Labor Day. These hours will continue until October 31. On November 1 the winter hours, 9 A.M. to 4 P.M., will go into effect.

THINGS YOU MAY HAVE MISSED

Closest Relative of Elephants is a Rabbit-sized Animal

The dassie (also known as hyrax, and cony or coney), an animal only about the size of a rabbit, is the closest living relative of the elephant. However, in appearance it resembles a nondescript sort of rodent. When its anatomy is examined it proves to be related to the rhinoceroses and horses, as well as to the elephants!

A small habitat group of these odd little creatures which live in Africa (the North American cony of our west is no close relative) is on exhibition in Carl E. Akeley Memorial Hall (Hall 22). The specimens were collected in Ethiopia in 1926–27 by the *Chicago Daily News*–Field Museum Abyssinian Expedition.

The relationship of the dassie to the elephant is established by its internal characters, and more especially by the structure of its feet. The molar teeth are strikingly like those of the rhinoceros. The size and general appearance of the dassie

DASSIE OR CONEY

Related not only to Jumbo, but to rhinos and horses.

would lead the average layman to assume that it was a rodent, but actually the little animal belongs, as do both the elephant and the rhinoceros, to the great assemblage of ungulates or hoofed mammals. Its real systematic relations are with the primitive fossil hoofed animals of Eocene age that had five fingers and five toes, and it would be quite correct to refer to the hyrax as a "living fossil."

The dassie has the distinction of being mentioned in the Bible under its other common name, coney: "The coneys are but a feeble folk, yet make they their houses in the rocks" (Proverbs: 30th Chapter: 26th Verse). By the natives of Ethiopia the dassie is called "chekoko" which resembles in sound the curious chattering call which makes the rocky hill habitations of these little animals extremely noisy.

Remarkably modern in design is an ancient Roman bronze bathtub, from Boscoreale, exhibited in Stanley Field Hall.

Field Museum of Natural History

FOUNDED BY MARSHALL FIELD, 1893

Roosevelt Road and Field Drive, Chicago

TELEPHONE: WABASH 9410

FIELD MUSEUM NEWS

EDITOR

CLIFFORD C. GREGG ..... *Director of the Museum*

ASSOCIATE EDITOR

WILFRED H. OSGOOD ..... *Curator Emeritus, Zoology*

CONTRIBUTING EDITORS

PAUL S. MARTIN ..... *Chief Curator of Anthropology*
B. E. DAHLGREN ..... *Chief Curator of Botany*
HENRY W. NICHOLS ..... *Chief Curator of Geology*
KARL P. SCHMIDT ..... *Chief Curator of Zoology*

MANAGING EDITOR

H. B. HARTE ..... *Public Relations Counsel*

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

A NEW VEGETABLE WAX

BY B. E. DAHLGREN
CHIEF CURATOR, DEPARTMENT OF BOTANY

Importers of South American raw materials are offering a new vegetable product under the name of "ouricury wax." Its appearance and physical properties are very similar to the darker grades of the well-known carnaúba wax from northeastern Brazil, which is the most important ingredient of floor-wax and automobile polishes. Like carnaúba wax, ouricury is the product of a palm. It is not at all closely related to the fan-leaved carnaúba palm, although it grows in a somewhat similar environment in the area to the south and east of the semi-arid Carnaúba zone of northeastern Brazil. In both cases the wax is produced as a thin coating on the leaves of the plant, affording, no doubt, in a hot and dry region, some protection against excessive evaporation of water.

Of the two waxes, the ouricury is by far the more troublesome to gather. Being firmly adherent to the leaf even in the dried state, it cannot be loosened like carnaúba wax simply by beating the cut leaves after a few days of drying. Ouricury wax must be obtained from the dried leaves by a much more time-consuming process of scraping the upper surface of the many divisions of the feather-veined leaf. This is done with a knife or a piece of broken glass. The result is a rather coarse, dirty-yellow powder consisting of wax mixed with fragments of leaf epidermis. This crude wax is then cleaned by sifting, liquefied by heat, strained, and poured into molds.

The palm that yields the ouricury wax is one of the small-fruited Cocos palms, numerous in South America, and characteristic of that continent. The species concerned, *Coco coronata* or *Syagrus coronata*, forms a small or medium-sized tree, with a trunk six to eight inches in diameter and a crown of rather stiff and short feather-veined leaves. The leaves are arranged in five spiral rows, strikingly evident at the point of their attachment to the trunk. The palm is extremely abundant in the state of Bahia, where its common name is "licury." As a name for the wax this would have been preferable to the market designation, "ouricury." The latter has long been well-known as the common name for a very different palm from a region far removed from that of the licury and is therefore obviously confusing.

While licury palm wax is of relatively recent introduction, the licury palm has long been known and esteemed as a source of oil. This is obtained from the kernels of its fruit, generally by expression. Where the palm is abundant the oil is a considerable source of revenue. It is estimated that there are billions of these palms in the state of Bahia alone, a total capable of yielding the inhabitants an income comparable to that furnished by the coffee crop of other states. Unfortunately, the extensive cutting of leaves for wax is not conducive to the vigorous growth required for great oil production, but nevertheless the opportunities for the expansion of both of these products are enormous. To date the exploitation is confined to trees growing wild. As usual in the case of tropical forest products, not only the quality and abundance of the product, but accessibility, transportation facilities, and density of population are important considerations governing the prospects of the industry.

On exhibition in Hall 25 (Case 47) of the Department of Botany are a leaf and fruit of the ouricury palm, and a specimen of the wax. In the same hall is an exhibit pertaining to the carnaúba palm and its wax.

Botanical Expedition to California

An expedition left Field Museum toward the end of August to study and collect the cryptogamic plants of California. The party will spend several weeks in the northern mountainous counties, giving special attention to the algae and mosses of the region. A week will be devoted to collecting in the vicinity of San Francisco Bay to secure additional material of, and to study in the living condition, the numerous species of microscopic algae described from there in the past. The remainder of the six or eight weeks will be taken up with studies of the flora of the San Joaquin and Imperial Valleys in the central and southern parts of the state. The members of the expedition, Dr. Francis Drouet, Curator of Cryptogamic Botany, and Mr. Donald Richards, of the Hull Botanical Laboratory, University of Chicago, plan to return to Chicago during the latter part of October.

Staff Notes

Mr. Llewelyn Williams, Curator of Economic Botany, on a recent trip to the state of Washington visited logging camps and sawmills of the White River Lumber Company, Enumclaw; The Weyerhaeuser Lumber Company, Longview, and others. He was a guest also of the Lathrop Pack Forestry Station, La Grande. Selections were made of exhibition material of noble fir, Sitka spruce, and alder, three species which are still needed to complete the American timber display in Charles F. Millspaugh Hall. Herbarium specimens were collected along the Pacific coast.

Mr. Carl F. Gronemann, for many years the Museum's Illustrator, has been retired on pension, due to advancing years and ill health. His assistant, Mr. John Janecek, has been appointed Illustrator.

Dr. Fritz Haas, Curator of Lower Invertebrates, attended the annual meeting of The American Malacological Union, at Thomaston, Maine, August 26–29, and lectured on "The Habits of Life of Some West Coast Bivalves."

A FEW FACTS ABOUT FIELD MUSEUM

Field Museum is open every day of the year (except Christmas and New Year's Day) during the hours indicated below:

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

Free courses of lectures for adults are presented in the James Simpson Theatre on Saturday afternoons (at 2:30 o'clock) in March, April, October, and November.

A Cafeteria serves visitors. Rooms are available also for those bringing their lunches.

Chicago Motor Coach Company No. 26 busses provide direct transportation to the Museum. Service is offered also by Surface Lines, Rapid Transit Lines (the "L"), interurban electric lines, and Illinois Central trains. There is ample free parking space for automobiles at the Museum.

SOUTHWEST EXPEDITION FINDS NEW AMERICAN CULTURE

The Field Museum Archaeological Expedition to the Southwest has resumed digging the now famous SU (pronounced "Shu") ruin. This ancient village is located in the west central portion of New Mexico, on a ridge in the Apache National Forest. The expedition has been financed through the generosity of Mr. Stanley Field, President of the Museum.

For the past six weeks, Dr. Paul S. Martin, Chief Curator of the Museum's Department of Anthropology, and a crew of twelve men have been uncovering the remains of primitive pithouses. (A pithouse is just what the term implies—a pit large enough to live in.) These pithouses are about 15 feet in diameter, and represent probably the oldest house type in North America.

FARM HORSES AND EQUIPMENT AID ARCHAEOLOGISTS

"Pithouse J"—one of the prehistoric underground habitations of prehistoric Indians, uncovered by excavations of the Field Museum Archaeological Expedition to the Southwest during the present season on the SU Site in New Mexico. Such pithouses are estimated to be some 1,500 years old, and are probably the oldest type of shelter used in North America.

Eight houses have been excavated and these have yielded a vast amount of potsherds, bone tools, stone weapons, and household utensils, according to a recent report received from Dr. Martin. It will take months of study to digest the mass of information they supply, and establish reasonable conclusions and hypotheses.

Dr. Martin is able, however, to hazard the judgment that the civilization unearthed at the SU village is a hitherto unclassified one, as only one or two sites even vaguely like it have ever been found and dug. Until recently, archaeologists have known only two major cultural groupings in the great Southwestern area: the Basketmaker-Pueblo, and the Hohokam. It has been only within the last two years that knowledge of a new major culture has begun to unfold. This new group, called "Mogollon" (pronounced "muggy-own") after the name of a high mountain range near which it is found, is distinct from the above two cultures. Its house types, pottery, and bone and stone tools follow a pattern distinctly their own. The great importance of Field Museum's SU site is that it stands at what is apparently the beginning of the Mogollon culture.

A DIFFICULT EXCAVATION TASK

The houses, tools, and pottery are so crude and so early that they almost defy description. It is a great triumph even to locate the houses, because they are so deeply and perfectly buried that they cannot be detected by outward manifestations. There are no walls showing as in better-known ruins; there are no prominent mounds of earth and stone waiting to be explored. The only manner in which the Field Museum crew can locate these ancient, crude houses is by stripping off all the surface soil down to glacial clays, or by trenching.

Therefore, trenches four feet wide and one foot deep are sunk into the top and sides of the ridge on which the SU village is located. If the men encounter "sterile" (that is, undisturbed, primeval earth), the soil will be yellowish and hard to dig. But when the soil in the trench suddenly becomes black, filled with pieces of charcoal and broken pottery, and is easy to dig, then the diggers know that they are in "fill." This fill—which might be called the archaeologist's "pay-dirt"—is soft, refuse-laden soil which washes into abandoned pithouses. Cleaning out this fill is an arduous and delicate task, for if the digger is not careful, he will dig right through a wall, since it also consists only of dirt.

In the soft dirt which lies on the house floor, tools of stone and bone, and broken pieces of pottery are found. These discarded, broken, partly disintegrated, and forgotten fragments of an ancient civilization are the clues which Dr. Martin and his assistants use for piecing together the story of this now extinct culture.

What people lived in these long abandoned pithouses, and what became of them, are mysteries which Dr. Martin would like to solve. Did these people die out, leaving no descendants? Did they migrate and merge with other Indians, whose modern descendants carry a strain of the ancient Mogollon blood? Or did other Indians move in and intermarry with the people of the SU village? No one yet knows the answers to these questions.

SKELETONS TO BE STUDIED

However, some light may be thrown on this Mogollon race by the study of skeletons which have been discovered. One such skeleton, recently unearthed, was of particular interest. Apparently this person had been buried in the debris of a burned house, instead of in a small pit beneath the floor, as was the usual custom. Later, the house had served as a general dump for the rest of the village. Two bone awls and five pieces of mineral paints were found in the lap of this individual. These articles had presumably been contained in a leather bag, all traces of which have long ago disappeared. These paints were green (malachite); blue (azurite); red (hematite); yellow (limonite), and black (magnetite). This person had probably been an artist or possibly a healer who had achieved some importance in the village. The sex and race of this skeleton will be determined when the other skeletons are studied, measured, and analyzed next winter in the Museum laboratory.

Dr. Martin believes the SU village to be 1,500 years old, or older. Exact dates have not yet been determined, although it is hoped that the charred roof beams which are being recovered and carefully preserved will give the exact dating for this village.

Less spectacular than the fossil skeletons of large prehistoric animals in Ernest R. Graham Hall (Hall 38), but equally interesting to the student of life forms and evolution, are the exhibits of primitive invertebrates in Frederick J. V. Skiff Hall (Hall 37).

SATURDAY LECTURES FOR ADULTS TO BEGIN ON OCTOBER 4

The autumn season of free illustrated lectures on Saturday afternoons will begin on October 4. The first to be given is "The Netherlands East Indies," by Mr. Dillon Ripley, leader of two expeditions for The Academy of Natural Sciences of Philadelphia.

The complete schedule of these lectures, to be given on each Saturday during October and November, will appear in the next issue of FIELD MUSEUM NEWS. All lectures begin at 2:30 P.M., and are presented in the James Simpson Theatre of the Museum.

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 should be made in advance by telephone (Wabash 9410) or in writing, and seats will be held in the Member's name until 2:30 o'clock on the day of the lecture. All reserved seats not claimed by 2:30 P.M. will be made available to the general public.

GIFTS TO THE MUSEUM

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

Department of Botany:

From Dr. Narciso Souza-Novelo, Mérida, Yucatan, Mexico—34 herbarium specimens, Yucatan; from Escuela Nacional de Agricultura, Chimaltenango, Guatemala—54 herbarium specimens, Guatemala; from James Zetek, Balboa, Canal Zone—22 herbarium specimens, Panama; from Rev. Padre Cornelio Vogl, Caracas, Venezuela—300 herbarium specimens, Venezuela; from Rev. Brother Elias, Caracas, Venezuela—250 herbarium specimens, Venezuela; from Miss Netta E. Gray, Urbana, Ill.—100 specimens of algae, Arkansas; from Donald Richards, Chicago—45 specimens of mosses; from Dr. Walter Kiener, Lincoln, Neb.—37 specimens of algae, Nebraska; from Dr. Lee Walp, North Truro, Mass.—16 specimens of algae, Massachusetts; from Dr. M. J. Groesbeck, Porterville, Calif.—97 specimens of algae, California and Nevada; from Dr. Francis Drouet, Chicago—245 specimens of algae, New York; from L. J. King, Chicago—41 specimens of algae, Illinois and Indiana; from Prof. H. Pittier, Caracas, Venezuela—133 specimens of plants, Venezuela; from Dr. C. M. Palmer, Indianapolis, Ind.—23 specimens of algae, Indiana.

Department of Geology:

From A. H. Becker, Madison, Wis.—one specimen of anorthoclase moonstone, Wisconsin; from M. Cedric Gleason, Washington, D.C.—2 specimens of turquois, Virginia.

Department of Zoology:

From Lincoln Park Zoo, Chicago—one Asiatic porcupine; from John Kurfess, Hinsdale, Ill.—9 snakes, Arizona, Illinois, and Minnesota; from Edwin S. Cieslak, Chicago—149 garter snake skins, Illinois and Washington; from Chicago Zoological Society, Brookfield, Ill.—10 miscellaneous birds; from Leslie Hubricht, St. Louis, Mo.—6 cave salamanders, Missouri; from Grayson Meade, Crockett, Tex.—14 lizards and one snake, Texas.

The Library:

Valuable books from Dr. Carlos A. Marelli, La Plata, Argentina; from J. McGregor Littell, Mt. Arlington, New Jersey; and from Dr. Fritz Haas, Elmer S. Riggs, and Loren P. Woods, all of Chicago.

NEW MEMBERS

The following persons became Members of Field Museum during the period from July 16 to August 15:

Associate Members

Mrs. Albert I. Ullmann, Samuel R. Rosenthal.

Annual Members

Floyd D. Cerf, V. W. Coath, Samuel Danits, John H. Denson, Joseph H. Donberg, Joseph I. Geneser, Martin Gorski, Dr. A. H. Grimmer, Mrs. Ralph R. Hawkins, J. A. Holmes, Irving A. Horwitz, Alfred C. Johnson, Henry A. Juers, Dr. George G. Knapp, George F. Leibrandt, Mrs. Grace McDonough, A. E. Millard, Ralph Newberger, Dr. George J. Porter, John P. Robertson, Frank Ryan, Mrs. Joseph True Steuer, William M. Stuart, Joseph P. Sullivan, Merrill Symonds, John Symons, William G. Taylor, Felix VanCleef, Arnold Spencer Wahl, J. E. Waitman, C. Arthur Wales, Louis R. Walker, West Wuichet, Benjamin F. Wupper.

SEPTEMBER LECTURE TOURS

Conducted tours of exhibits, under the guidance of staff lecturers, are made every afternoon at 2 o'clock except Saturdays, Sundays, and certain holidays. Following is the schedule for September:

Week beginning September 1: Monday—Labor Day holiday, *no tour;* Tuesday—General Tour; Wednesday—Life Under the Waters (Miss Elizabeth Best); Thursday—General Tour; Friday—The Races of Mankind (Mrs. Leota G. Thomas).

Week beginning September 8: Monday—Plants in Modern Industrial Life (Miss Marie B. Pabst); Tuesday—General Tour; Wednesday—Men of the Stone Age (Miss Elizabeth Hambleton); Thursday—General Tour; Friday—Gems and Their Histories (Bert E. Grove).

Week beginning September 15: Monday—Some Modern Animals and Their Ancestors of Yesterday (Miss Elizabeth Best); Tuesday—General Tour; Wednesday—Bird Life in the Chicago Region (Mrs. Leota G. Thomas); Thursday—General Tour; Friday—The Development of A Forest (Miss Marie B. Pabst).

Week beginning September 22: Monday—The Near East, Cradle of Civilization (Miss Elizabeth Hambleton); Tuesday—General Tour; Wednesday—Prehistoric Life (Bert E. Grove); Thursday—General Tour; Friday—Where Did the Indians Come From? (Miss Elizabeth Hambleton).

Week beginning September 29: Monday—Animals and the Uses We Find for Them from Clothing to Transportation (Miss Elizabeth Best); Tuesday—General Tour.

Persons wishing to participate should apply at North Entrance. Tours are free. By pre-arrangement with the Director, special tours are available to parties.

Museum to be Represented in Science Symposium

In the course of its fiftieth anniversary celebration, the University of Chicago will entertain the American Association for the Advancement of Science. The feature of the programs will be symposia on various topics of especial current interest. In advance of the meetings of the association there will be a symposium on *The Training of a Biologist* in which Chief Curator Karl P. Schmidt of Field Museum's Department of Zoology has been asked to take part. Mr. Schmidt will represent the standpoint of the field naturalist and systematic zoologist in the discussion.

The manufacture of common brick in all stages from digging the clay to loading the finished product on cars is illustrated by a large and elaborate model on exhibition in Hall 36 of the Department of Geology.

MEMBERSHIP IN FIELD MUSEUM

Field Museum has several classes of Members. Annual Members contribute $10 annually. Associate Members pay $100 and are exempt from dues. Sustaining Members contribute $25 annually for six consecutive years, after which they become Associate Members and are exempt from all further dues. Life Members give $500 and are exempt from dues. Non-Resident Life Members pay $100, and Non-Resident Associate Members $50; both of these classes are also exempt from dues. The Non-Resident memberships are available only to persons residing fifty miles or more from Chicago. Those who give or devise to the Museum $1,000 to $100,000 are designated as Contributors, and those who give or devise $100,000 or more become Benefactors. Other memberships are Honorary, Patron, Corresponding and Corporate, 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 membershipa. 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.

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 for federal income tax purposes.

Endowments may be made to the Museum with the provision that an annuity be paid to the patron for life. These annuities are guaranteed against fluctuation in amount, and may reduce federal income taxes.

PRINTED BY FIELD MUSEUM PRESS

Field Museum News

Published Monthly by Field Museum of Natural History, Chicago

Vol. 12 OCTOBER, 1941 No. 10

INTERTIDAL VEGETATION OF NORTH ATLANTIC COAST SHOWN IN NEW EXHIBIT

By FRANCIS DROUET
CURATOR OF CRYPTOGAMIC BOTANY

A habitat group showing the intertidal vegetation of the rocky north Atlantic shore has just been completed and installed in Martin A. and Carrie Ryerson Hall (Hall 29, the Hall of Plant Life), in the Department of Botany. Placed immediately to the right of the large alpine meadow group which occupies a central position at the north end of the hall, the new group is of the same size as the Illinois woodland scene installed about a year ago in a corresponding space on the left side.

Work upon this exhibit has been in active progress for more than a year. The material and studies on which it is based were obtained by two expeditions to the north Atlantic coast, one in 1939 by Mr. John R. Millar, and one in 1940 by Mr. Emil Sella, Chief Preparator in the Department of Botany. The first was sponsored by Mr. Sewell L. Avery, a Trustee of the Museum. Both expeditions visited the shores of the Bay of Fundy. The first one resulted in a large quantity of material with photographic records and observations which have served as a basis for the planning of the general lines of the group. A sketch model was prepared by Mr. Millar (then a member of the Department of Botany staff, now Curator of the N. W. Harris Public School Extension) on his return to the Museum. When other duties later prevented Mr. Millar's further attention to the project, it was taken over by Mr. Sella who has since carried the work to its present successful conclusion.

Although water covers nearly three-fourths of the earth's surface, many of us do not realize that there exists in it a vegetation which perhaps exceeds in number of kinds and individuals the more familiar land vegetation. The large plants found in fresh water are chiefly flowering plants. A few mosses and algae are easily seen, but the majority of species present are of microscopic algae familiar to the naked eye only at certain times during the year when millions of individuals grow together as scum and water-blooms.

SEAWEEDS ON ROCKS NEAR EASTERNMOST POINT OF UNITED STATES
At hundreds of places along the shores of Maine and Canada grow the conspicuous algal plants reproduced in this new habitat group just completed and opened to public view in Martin A. and Carrie Ryerson Hall (Hall 29, Plant Life).

Most of the water covering the earth's surface is salty, however, and is to be found far from Chicago in the oceans and the seas. There the algae are represented by thousands of species. Many are so small that they can be seen only under the microscope or where they have developed in large enough masses to form floating scums or coatings on submerged objects. They range in size according to species and habitat from minute few-celled plants to giant kelps hundreds of feet long. Those which are visible to the naked eye are popularly called seaweeds.

The seaweeds, well-known to everyone who has visited the coast, mostly grow attached to rocks along the shore; the familiar forms are those which cover the rocks between high and low tide-levels. On the Atlantic coast of North America from Cape Cod southward, the water is shallow along shore, and vast meadows of rockweeds (Ascophyllum and Fucus) are often seen exposed at low tide wherever rocks or stones are present.

Some kinds of seaweeds grow only where the water covers them completely at all times. Others grow only at such heights between tide-levels that they are covered with water for half of each day. Others develop only where they are exposed to the air most of the day and are covered with water for a short time at high tide. This peculiarity gives rise to a distribution of the species in horizontal zones, especially where the rocks rise steeply out of deep water. Along the coast of northern Maine and Nova Scotia the difference between high and low tide-levels is in places more than fifty feet; where the rocky shore is precipitous, one sees a broad upper zone of certain species of Fucus, a lower zone of other types of Fucus mixed with Ascophyllum, and a still lower fringe of a large number of species of red, brown, and green seaweeds. At certain levels, especially toward low tide-mark, narrow fringes of dulce and Irish moss are seen where only a certain peculiar degree of submersion and exposure is to be found.

The greatest number of species is present at and just below low tide-level. Here and in deeper water the red algae predominate in number of species, though rockweeds,

kelps, and sea-lettuce may be more conspicuous in some places. On rocks in deeper water the seaweeds are entirely red algae; these are as a rule seen only when they are dredged from the bottom or become caught in fish-nets.

In the north Pacific Ocean the seaweeds which attract attention are primarily the brown algae. Here, mostly at and below low tide-level, one finds giant kelps (Nereocystis, etc.), the bodies of which are longer than our highest trees. They present considerable variety in structure, and many of the larger ones possess bladders or floats, filled with gas, which buoy up the free ends. The rocks are covered with red algae quite different from those on the Atlantic coast, many attaining considerable size.

In shallow tropical and subtropical waters the striking species are often the calcareous seaweeds. These are mostly classed as green and red algae. The green algae present the bizarre shapes of shaving brushes, parasols, and mushrooms. The red algae (corallines) develop as fragile or stony branching masses or occur as crusts on rocks. These calcareous algae play a considerable role, along with the corals (which are animals), in the formation of coral islands and reefs.

Some seaweeds exist in unattached state in the warmer seas. Certain species of sargassum, branching brown seaweeds which possess small globular floats, so cover many square miles of the tropical Atlantic Ocean that a large area there has been called the Sargasso Sea. Reports are that these algae have at times been an impediment to navigation. Certain microscopic algae develop in such profusion as to cover the water with a scum or to color its upper layers markedly, as do the dinoflagellates and Trichodesmium. The latter alga grows aggregated into very small flakes that color the water blood-red, and it is said to be responsible for the naming of the Red Sea.

A small number of conspicuous algae grow in brackish ponds along low-lying coasts where the salt water is diluted periodically by rains, and also in the mouths of rivers where fresh water is mixed with salt. In such places most of the seaweeds are green algae: Enteromorpha, Ulva (sea-lettuce), and Cladophora. Certain red algae, especially species of Gracilaria, are often in evidence. Such habitats are occupied mainly by hundreds of species of sulfur bacteria and of microscopic algae: diatoms, flagellates, and blue-green algae.

The same type of vegetation is characteristic of harbors polluted by wastes from large cities. Ulva and Enteromorpha are the conspicuous seaweeds, sometimes to the exclusion of all others. It is here that most people become acquainted with the huge detached plants of the sea-lettuce, floating or cast up on shore among an unappetizing assortment of débris.

Though many of them attain massive size and the majority are large enough to attract the attention easily, the seaweeds are scarcely comparable with the flowering plants in shape and structure. Only a few—sargassums and some of the rockweeds and kelps—have organs which superficially resemble roots, stems, and leaves. Their cellular structure is very different. Not the least conspicuous feature about them is their color. Most seaweeds contain in every cell various chemical substances that mask the green coloring matter which they have in common with the cells of flowering plants. Since differences in methods of reproduction and certain features of internal structure and outward appearance go hand-in-hand with the type of coloring matter present, the seaweeds are classified according to their color. Thus the chief classes of algae are designated as the red, brown, green, and blue-green. The members of the last class are mostly small, developing as slimes on objects between tide-marks or as crusts on rocks in the salt spray above high tide-level; some, like the Trichodesmium mentioned above, give a distinctive color to the water where they occur in great numbers.

Among the red and green algae the plants are made up of fine or coarse threads or cords, variously branched; others are hollow tubes or delicate or tough membranes. The great variety of delicately branched forms has always been a matter of interest to those who enjoy making collections of beautiful and artistic natural objects.

IMPORTANT IN "ECONOMY" OF OCEANS

The algae constitute the sole food of myriads of marine animals and are thus of fundamental importance in the economy of life in the sea.

Seaweeds are useful to man in many ways. In China and Japan they are a common article of food. The bird's-nest soup of the Chinese is made mostly of algae. At least in Japan many species used as food are especially cultivated in sea-gardens. Certain red algae—dulce and Irish moss—are often used as food along the shores of the north Atlantic Ocean. Much of the iodine of commerce comes from the kelps. The egar so widely employed in bacteriological laboratories and in medicine is prepared from various seaweeds. Much interest has been shown in extracting material from seaweeds that can be used in place of rubber and plastics. Along coasts where they are plentiful the seaweeds have considerable importance as agricultural fertilizer and as a source of potash.

From the point of view of museum technique the new diorama is a notable achievement. In the hands of Chief Preparator Sella, the usual plastic materials, from plaster of Paris to lucite, employed with great skill and judgment, have served to produce a faithful replica of a bit of rocky seashore with its seaweed covering exposed at ebb-tide. Some of the purely repetitious, mechanical work required for this, as for other recent exhibits, was performed under Mr. Sella's supervision by handicraft workers furnished by the Works Progress Administration. The background was painted by Staff Artist Arthur G. Rueckert.

THINGS YOU MAY HAVE MISSED

Tree Oysters

Oysters that live in trees are a strange feature of life in the swamps of Florida. They grow in clumps or groups, attaching themselves to the roots of mangrove trees. Half of the time they are in the water, and half of the time they are high and dry, as

AMPHIBIOUS BIVALVES

These oysters, from the Florida swamps where they attach themselves to mangrove roots, live out of the water during alternate six-hour periods, when the tide is out.

the tides ebb and flow every six hours daily. Tree oysters are especially adapted for this type of living, according to Dr. Fritz Haas, Curator of Lower Invertebrates. Ordinary or normal oysters could not survive the repeated periods of dryness, although they might occasionally endure an isolated six-hour period out of the water, he says.

A small group of these odd creatures, attached to a section of mangrove as in their life habitat, is on exhibition in the Hall of Lower Invertebrates (Hall M). Those shown in the accompanying illustration will be installed at a future date. They have a distinctly plant-like appearance, resembling some sort of fungus growth. This is so marked that one of the Museum's specimens attracted the attention of a visitor to Dr. Haas's office and led him to inquire why a "plant specimen" had been transferred to the Department of Zoology.

Raymond Foundation Receives Gift From Its Founder

Mrs. James Nelson Raymond, founder of the James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures, last month again gave Field Museum a contribution of $2,000 to be applied toward the expenses of the Foundation's activities. This is a continuance of the generosity which Mrs. Raymond has exemplified several times a year since the establishment of the Foundation in 1925, at which time she provided a large endowment fund. Her gifts during 1941 now amount to $4,000, as she had contributed $2,000 earlier in the year.

The work of the Raymond Foundation is recognized, both by authorities of Field Museum and those of the various public, parochial and private schools of Chicago, as one of the most important and valuable educational endeavors being conducted to supplement the regular curriculum prescribed for the children of this city. The benefits extended by this Foundation are manifold in form, and reach approximately a quarter of a million children every year.

When you see something in a Field Museum exhibit and would like to learn more about it than is available from the label, consult the Museum's reference Library on the third floor. The Library personnel will be delighted to serve you.

Mexican Mammals Collected on Mount Tancitaro

Mr. Frank C. Wonder, of the Museum's taxidermy staff, recently returned from a season's field collecting in Mexico. He worked in association with a party of students from the University of Illinois, under the direction of Mr. Harry Hoogstraal, on Mt. Tancitaro, a well-isolated mountain on the escarpment of the Mexican Plateau in the state of Michoacan.

Mr. Wonder's collection of mammals amounts to 329 specimens, and because of the excellent quality of the skins and the interest of the region from which they come, it forms a most gratifying addition to the Museum's Mexican mammals.

30-FOOT FOSSIL MARINE REPTILE SKELETON COLLECTED IN A SOUTH DAKOTA PRAIRIE

After collecting the skeleton of a marine reptile, thirty feet long, in a South Dakota pasture near the town of Kennebec, the Field Museum Paleontological Expedition to the West returned to Chicago September 6. The members of the expedition were Mr. Bryan Patterson, Assistant Curator of Paleontology, who was leader of the party; Mr. James H. Quinn, of the Museum's staff; Messrs. John Schmidt, Robert Schmidt, and Ellsworth Shaw, all of Homewood, Illinois, and Mr. Edwin C. Galbreath, of Ashmore, Illinois.

Work was conducted in both Colorado and South Dakota. The Kennebec sea reptile, which lived during the Cretaceous period about one hundred million years ago when a great salt sea covered what now constitutes the middle western plains, was a distant relative of the lizards. A member of the group known collectively as Mosasaurs, it had a very large head, an exceedingly long tail, flippers to paddle its way through the water, and many conical teeth. A notable feature was doubled-jointed jaws making it possible to achieve a wider gape for devouring the various other sea creatures upon which it preyed, according to Assistant Curator Patterson. The deposit from which it was excavated by Messrs. Quinn and Galbreath is known as the Pierre Shale. Hitherto Field Museum has had only a partial skeleton of this type of prehistoric animal, and the present specimen, nearly complete and much larger in proportions, will provide material for a much more effective exhibit. The Mosasaur preyed upon various fishes, invertebrates such as cuttlefish, and marine turtles which it probably devoured shell and all.

In Colorado, as reported in last month's FIELD MUSEUM NEWS, specimens were obtained of one of the earliest large mammals —the *Coryphodon*, a creature about the size of a hippopotamus but in its special characteristics unlike any animal living today. Previously there had been only three reasonably complete *Coryphodon* skeletons known. These animals, which have no modern relatives, lived in the early part of the Eocene epoch, more than forty million years ago.

Less spectacular, but offering even greater possibilities scientifically are specimens of small insectivores and primates of the early Eocene. To properly assess their scientific significance will require months of research, says Mr. Patterson, but it is expected that some of them will prove to be of species new to science, and some may have special value in the further study of the relationships of the tarsiers, lemurs, and other primitive members of the early monkey and man group of animals. Also collected were specimens of early relatives of the horse, rhinoceros and tapir, primitive rodents, and groups of animals of which no members exist in the modern world. The total collection of the expedition embraces more than 500 specimens.

FLYING AND SWIMMING REPTILES, INCLUDING THE MOSASAUR

The huge grotesque animal in the center is Artist Charles R. Knight's restoration of a Mosasaur, a type of marine reptile recently collected in South Dakota by the Field Museum Paleontological Expedition to the West. On the left in the picture, which is one of the series of large mural paintings in Ernest R. Graham Hall of Historical Geology (Hall 38), are Pterodactyls, or flying reptiles which had wing-spreads of more than twenty-one feet. On the right is another contemporary, the gigantic sea-turtle of the genus Archelon.

AUTUMN LECTURE COURSE FOR ADULTS OPENS OCTOBER 4

A region which currently figures in the the critical news of the day—the Netherlands East Indies—will be the subject of the first free illustrated lecture in the Annual Autumn Course to be presented for adults at Field Museum on Saturday afternoons during October and November. Two other lectures in the series of nine will deal with countries in which there is special interest at this time because of their strategic positions with relation to the course of world affairs—the nations of Latin America, and our northern territory of Alaska.

The lectures are to be given in the James Simpson Theatre of the Museum, and each will begin at 2:30 P.M. All of them will be illustrated with motion pictures, in many cases by films in natural colors. The demand for seats makes it necessary to restrict admission to adults; but on the mornings of the same Saturdays the James Nelson and Anna Louise Raymond Foundation will present free motion pictures especially for children. The theatre entrance will be open at 2 o'clock each Saturday.

Following are the dates, subjects, and speakers for the adult programs:

October 4—THE NETHERLANDS EAST INDIES.

Dillon Ripley.

The Netherlands East Indies, romantic and inaccessible, stretching for 3,500 miles across the eastern seas, are much in the news today. Rubber and tin, quinine and copra, loom increasingly in the world's economy. But parts of the East Indies are today still as mysterious and little-known as ever. From the experience and adventure gained during three years in the East Indies, Mr. Ripley presents a fascinating picture of life in the unknown mountains and inaccessible islands of this tropical paradise. He has conducted two expeditions for The Academy of Natural Sciences of Philadelphia. His lecture will be illustrated with motion pictures, mostly in color. Some of the places shown had never before been visited by white man, he says.

October 11—AMERICAN HOLIDAY WITH WILD LIFE.

Dr. Gustav Grahn.

Dr. Grahn has prepared an engrossing lecture, illustrated with notable color motion pictures of wild animal life in the Rocky Mountains, in Alaska, and in the vast wilderness areas of Canada. Some of the remote regions covered are completely inaccessible except by travel with pack train, on skis, or by airplane.

October 18—ALONG ALASKA TRAILS.

A. Milotte.

Since July, 1939, Mr. and Mrs. Milotte have been pictorially "shooting" their way through Alaska and northern British Columbia, preparing in color a vivid picture of the International Highway of the future to demonstrate its relationship to the territory. Theirs is the first picture of the proposed route through the vastness of northern British Columbia.

From Fairbanks, the heart of Alaska, Mr. Milotte's picture first traces the future International Highway, which today is largely an illusive trail through a vast uncharted wilderness. The second part of the picture follows the water highway through the Inside Passage and across the Gulf of Alaska.

October 25—HUNTING FOR WALRUS IN THE ICE FLOES.

Carl Dreutzer.

In the spring of 1940 Mr. Dreutzer was commissioned by the Chicago Zoological Society to hunt and capture young walrus for their zoological gardens at Brookfield. He captured three near Cape Prince of Wales in the Arctic Ocean, transported them by airplane to Nome, and thence by ship and train to the Brookfield Zoo. Now, Brookfield has the world's only live walrus in captivity. In colored motion pictures Mr. Dreutzer will show such features as a fight between a killer and a sperm whale, great slow-moving glaciers, panoramas seen while flying over the frozen tundra, Eskimo life, and the walrus hunt among the ice floes.

November 1—FROM SEASHORE TO GLACIER.

Karl Maslowski.

In this lecture the audience travels with Mr. Maslowski from the southernmost specks of land in the great Florida reef, the Dry Tortugas Islands, through the middle west, to the glacier-crested mountains of northwestern Montana, viewing through his camera lenses the abundance of animal life living in both strange and familiar places. Mr. Maslowski has had a wide experience as Curator of Birds for the Cincinnati Society of Natural History Museum, as photographer-naturalist for the Ohio Division of Conservation, and as lecturer in nature study at the University of Cincinnati. His films are in natural colors.

November 8—NEW WORLDS UNDERSEA.

Vincent Palmer.

Mr. Palmer writes: "This lecture is the story of my work as an undersea reporter—taking candid shots of John Q. Fish as if he were a person!—how he eats, sleeps, fights, communicates—all the intimate details I could get in color motion pictures made undersea. I have been especially keen on portraying how a fish lives his daily life, which is similar in many cases to the daily life of humans. The fact that the pictures show undersea creatures in their natural habitat makes them scientifically unique."

Mr. Palmer's films include close-up views of the octopus, porpoises, various crabs, sea turtles, and many other creatures in their normal routine of living.

November 15—FLORAKEYS.

James B. Pond.

The marine and floral life of the Florida Keys is vividly depicted in natural color motion pictures with which Mr. Pond illustrates his lecture. Many little-known forms of marine life are shown. Part of the lecture is devoted to a journey over the amazing Overseas Highway, "the road that goes to sea." Also shown are picturesque Key West with its famous flowering trees, and some intimate "shots" of the Seminole Indians whose life is little changed from what it was in "the old days."

November 22—PAN AMERICAN HIGHWAY.

James Sawders.

The Pan American Highway is probably the greatest project of its kind ever conceived. Ever since the perfection of the automobile, motorists have dreamed of long journeys into distant lands via this modern "magic carpet." Mr. Sawders' lecture will show how this wishful thinking is to become accomplished fact, how the Inter-American Highway to Mexico City is but a link in the great road which before many years will cover the entire length of the western hemisphere from Alaska to the Straits of Magellan. He will speak of the vital interest the United States government has in these roads from the standpoint of defense, and of the inestimable value to us of trunk highways to both Panama and Alaska in time of war.

November 29—THROUGH THE RAINBOW.

Stuart D. Noble.

Where are gems found? How are they cut? As a gem cutter Stuart Noble has answered such questions hundreds of times. Constantly encountering this widespread interest in gems, he decided to answer these many questions definitely.

The program "Through the Rainbow" is the result. By means of a lecture, gem exhibit and motion picture, the story of precious stones is told in a concise, understandable and fascinating manner. The film shows the actual cutting of a gem (said never before to have been accurately photographed), and close-ups of many rare and lovely gems, entirely in natural colors.

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. Requests for these seats should be made in advance by telephone (WABash 9410) or in writing, and seats will be held in the Member's name until 2:30 o'clock on the day of the lecture. All reserved seats not claimed by 2:30 P.M. will be made available to the general public.

MUSEUM SENDS "THE WORLD, CUT OPEN," TO CHILDREN

By JOHN R. MILLAR
CURATOR, N. W. HARRIS PUBLIC SCHOOL EXTENSION

Concepts of the nature of the earth, the solar system, and the universe are taught in every elementary grade under the spiral course* of study in science now in use in the Chicago Public Schools. In furtherance of the desire to provide exhibits definitely related to the subject matter of the curriculum, a diagrammatic model showing the supposed structure of the interior of the earth has recently been made for addition to the portable school cases circulated by the N. W. Harris Public School Extension. It is an adaptation of a larger model which has been on display for some time in Clarence Buckingham Hall of Structural Geology (Hall 35).

SIMPLIFIED VERSION OF EARTH MODEL FOR SCHOOL CHILDREN

A new exhibit circulated by the N. W. Harris Public School Extension to assist Chicago teachers and their pupils. It provides a graphic representation of facts about the interior of the earth in a form that youngsters can readily understand.

At first one might think that the subject is too difficult for grade school pupils, and that the findings of scientists are none too conclusive about the matter. However, the value of the exhibit lies not in its summary of present day theories about the structure and composition of the earth's interior, but rather in the appeal the subject makes to the imagination of most people, young or old. Education in science consists of more than the acquisition of a body of cold facts. It also means the development of an inquiring attitude of mind. Speculation as to the origin and development of the earth has perplexed mankind for generations. The problem is still worthy of study by possessors of the best intellects.

The new school exhibit is also of interest as an example of the successful modification of a more formal, large-sized museum model to fit the limited space available in the portable school cases. The small model, done in relief only two inches high, conveys a feeling of the roundness actually present in the prototype. A deliberate attempt to attract attention from a distance was made through the bold use of color.

Further than this, the new case is the first of a series of exhibits for school use in the study of geology—a series which, when completed as planned, will illustrate all the important concepts and principles properly included in an elementary survey of the subject.

The models in the new cases circulated by the Harris Extension, and the more elaborate model on exhibition in Clarence Buckingham Hall, both represent the earth with parts cut away to show the interior. Instead of a thin crust over a molten interior, as the earth's structure was once conceived, the models show three concentric shells of rock of increasing density enclosing a core of hot metal.

Obviously, the features shown have not been directly observed, since the earth's diameter is 8,000 miles while the deepest excavations for mines have penetrated only into the outer crust, and that for less than two miles. Yet, despite the impossibility of direct observation, the major structural features have been determined indirectly by study and measurement of geological and physical phenomena at the surface.

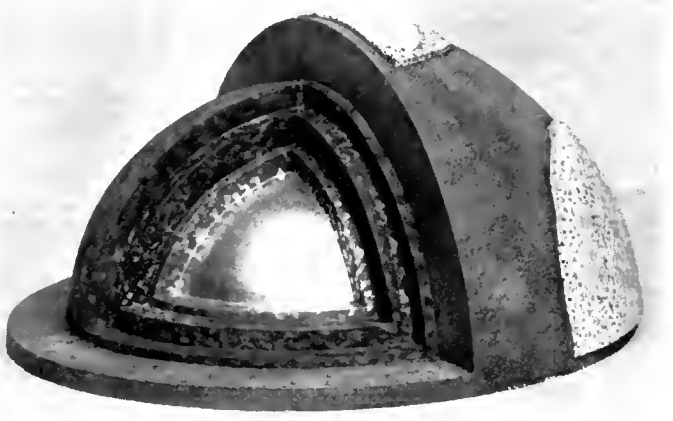


EXHIBIT IN MUSEUM SHOWING INTERIOR OF THE EARTH

Model in Clarence Buckingham Hall showing the various subterranean shells which, according to current theories of the earth's internal structure, surround a molten metal core.

* Under the "spiral" system the same subjects recur in each grade, but the treatment is adjusted to meet the growing knowledge and intelligence of the children.

Scope of Zoological Exhibits

When it is considered that there are more than 50,000 species of mammals, birds, fishes, and reptilians, while the insects, mollusks, crustaceans and other invertebrates run into hundreds of thousands of species, it is evident that no institution can exhibit more than a small part of them. However, the zoological exhibits in Field Museum are carefully selected and planned to embrace the entire field of animal life by representative species from the lower invertebrates to the highest mammals.

FIELD MUSEUM HONOR ROLL

Now in the Service of their Country:

Theodore Roosevelt, Trustee—Colonel, U.S. Army, commanding 26th Infantry, Fort Devens, Mass.

Joseph Nash Field, Trustee—Ensign, U.S. Navy, Headquarters, 9th Naval District, Great Lakes, Ill.

Clifford C. Gregg, Director—Major, U.S. Army, Assistant Adjutant General, 6th Corps Area, Chicago.

John Rinaldo, Associate, Southwestern Archaeology—Private, U.S. Army, 51st Field Artillery, Camp Roberts, Calif.

Melvin A. Traylor, Jr., Associate, Birds—Private, U.S. Marine Corps, Training Base, San Diego, Calif.

Patrick T. McEnery, Guard—Master-at-arms, U.S. Navy, Training School, Navy Pier, Chicago

John Syckowski, Guard—Chief Commissary Steward, U.S. Navy, 9th Naval District, Great Lakes, Ill.

George Jahrand, Guard—Chief Water Tender, U.S. Navy, 9th Naval District, Great Lakes, Ill.

Field Museum of Natural History

FOUNDED BY MARSHALL FIELD, 1893

Roosevelt Road and Field Drive, Chicago

TELEPHONE: WABASH 9410

FIELD MUSEUM NEWS

EDITOR

CLIFFORD C. GREGG.....*Director of the Museum*

ASSOCIATE EDITOR

WILFRED H. OSGOOD.....*Curator Emeritus, Zoology*

CONTRIBUTING EDITORS

PAUL S. MARTIN.....*Chief Curator of Anthropology*
B. E. DAHLGREN.....*Chief Curator of Botany*
HENRY W. NICHOLS.....*Chief Curator of Geology*
KARL P. SCHMIDT.....*Chief Curator of Zoology*

MANAGING EDITOR

H. B. HARTE.....*Public Relations Counsel*

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

RAYMOND FOUNDATION OFFERS PROGRAMS FOR CHILDREN

The James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures announces its autumn series of nine free programs, chiefly motion pictures, to be presented for children on Saturday mornings at Field Museum during October and November. These programs, to which children from all parts of Chicago and suburbs are invited, will be presented twice each Saturday, at 10 A.M. and at 11, in the James Simpson Theatre of the Museum. No tickets are needed for admission. Children may come alone, accompanied by adults, or in groups from schools, community centers, or other organizations.

The first program, on October 4, "Indian Lore, Life and Culture," will consist of a lecture by Charles Eagle Plume, a noted authority on American Indians who is himself part Indian. He will tell the story of Indian life, illustrating his subject with dancing and costumes. The other programs include motion pictures with sound, some in color, and, as an added feature on several, there will be animated cartoons. Following is the complete schedule:

October 4—INDIAN LORE, LIFE AND CULTURE. *Lecture by Charles Eagle Plume, illustrated with dancing and costumes.*

October 11—THE SPIRIT OF THE PLAINS (*story of the plains region west of the Mississippi*); and a cartoon.

October 18—ADVENTURES IN THE FAR NORTH (*birds, animals, and people*).

October 25—SOUTH AMERICA (*rubber, coffee, chocolate, etc.*).

November 1—MEXICO, OUR SOUTHERN NEIGHBOR; and a cartoon.

November 8—LIFE IN OUR SOUTHWESTERN DESERT; and a cartoon.

November 15—WILD ANIMALS (*color motion pictures by Sam Campbell*).

November 22—CANADA, OUR NORTHERN NEIGHBOR; and a cartoon.

November 29—THE RIVER NILE, EGYPT'S LIFE LINE (*from the time of the mummies*).

Rare Reptile Hatchlings Received

Field Museum recently received from Florida some hatchling alligator snapping turtles alive and in good condition. They are the first hatchling alligator snappers ever known to have reached a museum alive, and even preserved ones are rare. An average individual of this series has a shell only one and three-fourths inches long and weighs but .72 of an ounce; adults often weigh more than a hundred pounds or some 2,500 times as much as a hatchling.

This species, common in our southeastern states, is unique among turtles in having a red structure, on the floor of the mouth. This, when wriggled, looks like a worm. It is apparently used as a lure for catching fish and other prey. —C.H.P.

Staff Notes

Mr. Rudyerd Boulton, Curator of Birds, attended the recent meeting of the American Ornithologists' Union in Denver. He presented a paper, "Notes on Birds from the Mandel Galapagos Expedition." Mr. Boulton was re-elected Treasurer and Business Manager of the Union, a position which he has held since 1938.

Mr. Paul G. Dallwig, the Layman Lecturer of Field Museum, recently spoke before the La Salle (Illinois) Women's Club, and the Kappa Kappa Gamma Sorority Alumnae, of Evanston, on gem stones, with particular reference to the collection in H. N. Higinbotham Hall of the Museum.

School Extension Exhibits

If you have children in the schools of Chicago, they are acquainted with the natural history exhibits circulated by the Museum through the N. W. Harris Public School Extension. You may learn how this service teaches science by inspecting sample Harris Extension cases which are exhibited in Stanley Field Hall.

The culture and religious practices of the Potawatomi, a central Algonquian Indian tribe which formerly inhabited the Chicago region, are well illustrated by an exhibit in Mary D. Sturges Hall (Hall 5).

OCTOBER LECTURE TOURS

Conducted tours of exhibits, under the guidance of staff lecturers, are made every afternoon at 2 o'clock except Saturdays, Sundays, and certain holidays. Following is the schedule for October:

Wednesday, October 1—Minerals in Ancient and Modern Times (Bert E. Grove); Thursday—General Tour; Friday—Wood in Your Home (Miss Marie B. Pabst).

Week beginning October 6: Monday—Color in the Animal Kingdom (Miss Elizabeth Best); Tuesday—General Tour; Wednesday—Fashions from Cave Men On (Miss Elizabeth Hambleton); Thursday—General Tour; Friday—Conservation as a Part of National Defense (Mrs. Leota G. Thomas).

Week beginning October 13: Monday—Animals of the Past and Present (Bert E. Grove); Tuesday—General Tour; Wednesday—Travels of Plants (Miss Marie B. Pabst); Thursday—General Tour; Friday—Ornaments and Jewelry (Miss Elizabeth Hambleton).

Week beginning October 20: Monday—Why An Ever Changing Earth? (Mrs. Leota G. Thomas); Tuesday—General Tour; Wednesday—Ambassadors from Space (Bert E. Grove); Thursday—General Tour; Friday—Animals Found Around Chicago (Miss Elizabeth Best).

Week beginning October 27: Monday—Plants and Their Homes (Miss Marie B. Pabst); Tuesday—General Tour; Wednesday—The Story of Prehistoric Man (Mrs. Leota G. Thomas); Thursday—General Tour; Friday—Masquerade—Masks from Many Parts of the World (Miss Elizabeth Hambleton).

Persons wishing to participate should apply at North Entrance. Tours are free.

A FEW FACTS ABOUT FIELD MUSEUM

Field Museum is open every day of the year (except Christmas and New Year's Day) during the hours indicated below:

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

Free courses of lectures for adults are presented in the James Simpson Theatre on Saturday afternoons (at 2:30 o'clock) in March, April, October, and November.

A Cafeteria serves visitors. Rooms are available also for those bringing their lunches.

Chicago Motor Coach Company No. 26 busses provide direct tranaportation to the Museum. Service is offered also by Surface Lines, Rapid Transit Lines (the "L"), interurban electric lines, and Illinois Central trains. There is ample free parking space for automobiles at the Museum.

RODENTS OF PAST AND PRESENT—ONE EVEN HAD HORNS!

By PAUL O. McGREW
ASSISTANT CURATOR OF PALEONTOLOGY

In Ernest R. Graham Hall (Hall 38) an exhibit has recently been installed which illustrates certain interesting facts concerning the relationships of living and extinct rodents of the western hemisphere.

Everyone is familiar with at least some members of the order Rodentia, of which the most commonly known are rats, mice, rabbits, squirrels, porcupines, and guinea pigs. Rodents differ from other mammals in a number of characters, but principally in having a single pair of long, broad, chisel-like incisor teeth in front of the upper and lower jaws.

"MOST SUCCESSFUL" OF MAMMALS

Although most rodents are rather insignificant in size, in other respects the group may be regarded as the most successful of all mammals. They have invaded all of the large land masses of the world; they contain more genera and species than any other group of mammals, in fact more than all other orders combined; and they contain by far the greatest number of individuals. Rodents have become adapted for arboreal, terrestrial, burrowing, and semi-aquatic life. So-called "flying squirrels" have even become semi-aerial. Such a variety of habitats is occupied by no other order of mammals.

Until rather recently little was known of the geological history of rodents. The principal reason is that fossil specimens are usually so small that they were overlooked by early collectors. Another important factor is that the numerous larger and more spectacular forms claimed so much attention that the few fossil rodents known were not studied critically. Within the last few years, however, these small forms have attracted more and more attention, and the history of some groups has been fairly well determined.

Rodents, living and extinct, are divided into four major groups, or sub-orders. These are the Protrogomorpha, Sciuromorpha, Myomorpha and Histricomorpha. The differences between them are primarily in structural details of the skull and muscle attachments thereon.

The sewellel (sometimes called the mountain beaver) of the Pacific northwest is the only living member of the Protrogomorpha and is the most primitive of all living rodents. In Eocene deposits (50,000,000 years old) however, nearly all rodents found belong to this general group. It appears that all rodents have been derived from this primitive type. Fossils of this sub-order are found in North America, Asia and Europe.

Of particular interest among the Protrogomorpha is an aberrant form known as the Mylagaulidae. These are well distributed as fossils throughout the western United States. The mylagaulids became very highly specialized by early Pliocene times (7,000,000 years ago), and soon thereafter became extinct. The most striking character possessed by some of them consisted of huge horns on the nose—a structure found in no other rodent.

The sub-order Sciuromorpha contains a large variety of rodents, among them squirrels, beavers, and gophers. Of these, the squirrels are the most primitive in

FOSSIL RODENT WITH HORNS

Restoration by Artist John Conrad Hansen of a strange species which lived some 7,000,000 years ago in the west.

structure and may be traced back to protrogomorph ancestors. The ancestry of beavers and gophers is fairly well known but no intermediate forms connect them definitely with the protrogomorphs.

A GIANT BEAVER

Perhaps the most noteworthy of the sciuromorphs is the giant beaver, *Castoroides*, that lived during the Pleistocene (1,000,000 years ago) in North America, and its relative *Trogontherium*, of the Pleistocene of the Old World. These beavers reached a length of six feet and were the largest rodents ever to live. While for the most part they were very similar to our living beaver there were important differences in the detailed structure of the skull and dentition. These differences show that *Castoroides* and its relatives branched off from the main beaver stem rather early in geologic time. Several smaller types have been found in Tertiary deposits that seem to be ancestral to the giant beaver. Field Museum is particularly fortunate in having an excellent skeleton of *Castoroides* which is displayed in the new rodent case.

Among the Myomorpha, the true mice and rats, are found a number of familiar forms: the common house rats and mice, muskrats, wood-rats, harvest mice, and many others. The living representatives of the group appear to be of Old World origin, although in Oligocene times (30,000,000 years ago) members of this group lived in North America. The house mice and rats are not indigenous to America but were brought in by white man. Myomorphs now have practically a world-wide range. In some way they succeeded in reaching Australia, without the aid of man, after that continent had become isolated—an accomplishment duplicated by no other land mammal.

The Histricomorpha are a particularly interesting group. They have living members in every continent except Australia. The only North American form is the porcupine, and it is a relatively recent immigrant from South America. In the latter continent the histricomorphs are the dominant rodents, and until the beginning of Pleistocene time were the only rodents represented there. A form much like the American porcupine lives in Europe and Asia. In Africa there are several members of the sub-order.

INTERCHANGE BETWEEN CONTINENTS

In the exhibit recently installed an attempt has been made to show the complex phylogenetic history of a few well-known rodents of the western hemisphere. Skulls and jaws of extinct rodents have been placed in the case to show their relationships to those now living. Because skulls do not give lay visitors much idea of the appearance of live animals, paintings have been included of all the recent forms displayed. Another feature of the exhibit is a diagrammatic picture of the migration during late Eocene or early Oligocene times, of a primitive North American form (probably a protrogomorph) to South America. This migrant gave rise to all indigenous South American rodents, the Histricomorphs. In the later part of the Pliocene Epoch, when a land bridge rose to connect the two American continents, certain American forms (the squirrel) moved into South America while the porcupine of the southern continent moved into North America. This, too, is indicated in the exhibit.

RESERVATIONS OPEN THIS MONTH FOR SUNDAY LAYMAN LECTURES

The Layman Lecturer of Field Museum—Mr. Paul G. Dallwig, who has attained a remarkable popularity during the past several years among Chicagoans interested in cultural subjects—will begin his 1941-42 season of Sunday afternoon lectures in the exhibition halls in November. This is the fifth season in which he has conducted this activity, and it will continue for seven months or through May, 1942.

Daguerre Studio, Chicago

PAUL G. DALLWIG
The Layman Lecturer

Because of the recent opening of Field Museum's new Hall of Gems and Jewels (H. N. Higinbotham Hall), Mr. Dallwig has scheduled the lecture "Gems, Jewels and 'Junk'" for the five Sundays in November (November 2, 9, 16, 23, and 30).

Subjects of Mr. Dallwig's other lectures for this season are as follows: December, "Mysterious 'Night-Riders' of the Sky" (the story of meteors, meteorites, and the moon); January, "Nature's 'March of Time'" (prehistoric animals); February, "Digging Up the Caveman's Past" (Hall of the Stone Age of the Old World); March, "The Parade of the Races" (the races of mankind as depicted by Malvina Hoffman's famous sculptures); April, "The Romance of Diamonds from Mine to Man" (including the human interest stories surrounding many of the world's most famous historic diamonds), and May, "Who's Who in the Mounted Zoo" (a lecture never presented before, on animals in the Museum's Department of Zoology).

The heavy demand by the public for Mr. Dallwig's lectures, and the necessity of limiting each audience to 100 adults (*children cannot be accommodated*), make it necessary to require advance reservations. Persons desiring to attend are advised to apply several weeks in advance. Reservations will be accepted by mail or telephone (Wabash 9410) throughout the month of October.

The Sunday afternoon lectures begin promptly at 2 P.M., and end at 4:30. There is a half-hour intermission midway for refreshments in the Cafeteria.

The unique feature of Mr. Dallwig's lectures, which distinguishes them from other such presentations, is the manner in which he dramatizes his subjects while at the same time interpreting science with complete accuracy based upon thorough research. The Layman Lectures are given purely as a public service, for which Mr. Dallwig receives no compensation.

Museum Publication Wins Award

The William Brewster Medal of the American Ornithologists' Union has been awarded to Mr. Adrian Van Rossem, of the University of California at Los Angeles, and the late Donald S. Dickey, for their book *Birds of El Salvador* which was published in Field Museum's Zoological Series.

GIFTS TO THE MUSEUM

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

Department of Anthropology:

From Daniel A. Ray, Chicago—a wood and shell dagger, Micronesia.

Department of Botany:

From Paul H. Allen, Balboa, Canal Zone—48 herbarium specimens, Panama; from Dr. F. Webster McBryde, Berkeley, Calif.—29 herbarium specimens, Mexico; from Donald Richards, Chicago—35 specimens of hepatics, Indiana; from William A. Daily, Cincinnati, Ohio—110 specimens of algae, United States; from Illinois State Museum, Springfield, Ill.—84 herbarium specimens, Illinois.

Department of Geology:

From E. H. Sargent and Company, Chicago—7 specimens of refractories; from John J. Moroney and Company, Chicago—19 specimens of refractories; from M. Cedric Gleason, Washington, D.C.—2 turquois specimens (crystals) on quartz, Virginia; from Francis B. Chapman, Los Angeles, Calif.—2 specimens of minerals, California; from John W. Jennings, Eureka Springs, Ark.—2 specimens of chert and chalcedony, Arkansas; from John Skelly, South Milwaukee, Wis.—4 specimens of nickel ore, Canada.

Department of Zoology:

From Colorado Museum of Natural History, Denver, Colo.—a lizard, Bahamas; from Professor J. Soukup, Lima, Peru—767 insects, Europe and Peru; from Robert Haas, Chicago—5,963 fish specimens, Illinois; from John M. Schmidt, Homewood, Ill.—31 mammals, 4 skeletons, and 5 odd skulls, Colorado; from Henry S. Dybas, Chicago—50 dragonflies and 10 ant lion adults, the Americas and the Philippines; from Rupert L. Wenzel, Chicago—115 insects and allies, South Dakota and Indiana; from Dr. Fritz Haas, Chicago—853 specimens comprising 23 species of lower invertebrates, Maine; from Loren P. Woods, Chicago—124 fish specimens, Illinois; from Chicago Zoological Society, Brookfield, Ill.—3 snakes.

The Library:

Valuable books from Dr. Fritz Haas, Chicago; Mr. and Mrs. L. S. Dillon, Reading, Pa.; Emil Liljeblad, Villa Park, Ill.; and Dr. Henry Field, Washington, D.C.

Harrison Extension:

From John W. Jennings, Eureka Springs, Ark.—18 specimens of chert and chalcedony, Arkansas.

Examples of the world's largest snakes—the boas and pythons—are exhibited in Albert W. Harris Hall (Hall 18).

NEW MEMBERS ADDED TO MUSEUM ROLLS

The following persons became Members of Field Museum during the period from August 16 to September 15:

Associate Members

Thomas J. Carney, Mrs. Ernest H. Hicks, Forrest H. Redmond, Herbert Sieck.

Annual Members

Alexander Beck, Mrs. Bessie J. Best, Ernest Blume, James G. Culbertson, Fred Greenslade, Albert T. Hall, Miss Fanny A. Hall, G. F. Hoope, Jr., Elmo G. Johnson, Leonard O. Krez, Mrs. Oscar T. LeBeau, Daniel Novick, William F. O'Keeffe, John B. Phillips, Dr. Manuel Spiegel, Dr. David C. Straus.

Museum Hours Change October 27

Due to a change in its lighting contract with the Commonwealth Edison Company, Field Museum will institute its winter visiting hours, 9 A.M. to 4 P.M., on October 27, instead of November 1 as previously announced.

Five Hopi altars, each dedicated to use for a different kind of ritual, are included among the exhibits in Hall 7 of the Department of Anthropology.

MEMBERSHIP IN FIELD MUSEUM

Field Museum has several classes of Members. Annual Members contribute $10 annually. Associate Members pay $100 and are exempt from dues. Sustaining Members contribute $25 annually for six consecutive years, after which they become Associate Members and are exempt from all further dues. Life Members give $500 and are exempt from dues. Non-Resident Life Members pay $100, and Non-Resident Associate Members $50; both of these classes are also exempt from dues. The Non-Resident memberships are available only to persons residing fifty miles or more from Chicago. Those who give or devise to the Museum $1,000 to $100,000 are designated as Contributors, and those who give or devise $100,000 or more become Benefactors. Other memberships are Honorary, Patron, Corresponding and Corporate, 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.

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 for federal income tax purposes.

Endowments may be made to the Museum with the provision that an annuity be paid to the patron for life. These annuities are guaranteed against fluctuation in amount, and may reduce federal income taxes.

PRINTED BY FIELD MUSEUM PRESS

Field Museum News

Published Monthly by Field Museum of Natural History, Chicago

Vol. 12 NOVEMBER, 1941 No. 11

HUNTING THE RARE AND ELUSIVE GREEN PEACOCK IN THE INDO-CHINA JUNGLE

By WILFRED H. OSGOOD
CURATOR EMERITUS, DEPARTMENT OF ZOOLOGY

The common domesticated peacock has never become a barnyard fowl, since it is more ornamental than utilitarian, but it is known the world over, and everywhere is a symbol of splendor and pride. For many centuries—in fact, since the time of Solomon—it has been kept in captivity, but it still closely resembles its wild progenitor, which is a native of India and Ceylon.

There is, however, another species of peacock, almost if not quite as gorgeous, and comparatively little known—the so-called green or Javan peacock. This lives in the jungles of Burma, Siam, Indo-China, the Malay Peninsula, and the island of Java. It is rarely seen in captivity. It differs from the common species in many details, but mainly in the color of the neck and breast which is lively green, edged with golden, and slightly squamate instead of smooth deep blue. Its display plumage, formed by the extraordinary development of the upper tail coverts, commonly but falsely called the "tail," is quite as magnificent as in the better known bird.

In selecting subjects for habitat groups to be shown in Field Museum's hall of foreign birds, it was early decided that such an important bird as the peacock could not be omitted although space for only a few Asiatic species was available. Therefore, in 1937, when I set out for Indo-China with many more commissions than I could hope to fulfill, the green peacock was on my list. I was not expecting to do any extensive hunting or collecting, but the possibility of making the acquaintance, in the wild, of one of the world's finest birds was something of a challenge, and soon after landing in Indo-China I began making inquiries that might lead to success.

For several weeks, in the vicinity of Saigon and in the highlands behind it in extreme southeastern Indo-China, reports were discouraging. Peacocks did occur, but they were rare and seldom seen. Once, while motoring over one of the excellent roads the French have built through the forest, I had a glimpse of a half-grown male that slipped across the highway in front of the car, passing quickly from one dense thicket into another. I began to think this might be my only sight of a peacock, but a little later I was able to arrange a trip farther north and inland to the outskirts of administered territory. This was made possible through introductions to local officials which had been given me by the French naturalist, M. Jean Delacour, and further by invaluable assistance received from several American and Canadian resident missionaries, most especially from Mr. Herbert Jackson and Mr. Gordon Smith.

LARGEST MEMBER OF THE PHEASANT FAMILY

Green peafowl of Indo-China, roosting in a dead tree of the tropical lowland rain forests which they inhabit. Specimens for this new exhibit in the Hall of Birds were obtained by Dr. Wilfred H. Osgood, Curator of Zoology Emeritus, on an expedition which he both sponsored and conducted as a contribution to the Museum. The male bird's long train is a courtship device.

As a result, I soon found myself encamped a few miles southeast of Banmethuot in central Annam among the native tribe known as Raday, and as I awoke on the first morning I heard the loud calls of peacocks from all directions. Thereafter, during the one short week that I was there, peacocks were seen daily. At this time (April) the birds were in pairs and especially in the early morning and towards evening the males were calling. The cry is much like that of the common peacock, and the name for the bird, *pao*, which is used both by the French and the natives, is doubtless derived from it.

Although not at sea level, it was hot country with a seasonal forest, including much bamboo and scattered openings either natural or cleared for the cultivation of rice. In the old rice fields and meadow-like openings the peacocks were found feeding towards evening at some distance from any cover, but so alert that approach to them in such places did not succeed. With a small rifle and expert marksmanship, plus some very patient stalking, a few might have been brought to bag; but I was carrying only a shotgun, and after several attempts to get within range at the expenditure of much perspiration and profanity, scratched hands and face, and encounters with hordes of ants, other methods of hunting naturally began to find favor.

The birds, in parties of four to six, often mixed with herds of domestic buffalo which were feeding in the open fields, and in such cases approach to them was doubly difficult. It was soon found, however, that if these birds were not alarmed, they could be watched until darkness set in when they

made their way to tall trees to roost. Then with care and good luck it was possible to get a shot. After the breeding season the birds gather in flocks, often numbering thirty or forty individuals, and then other methods of hunting are possible.

Since the birds were nesting, they were confined to definite areas, so by noting the calls from time to time, and with the help of native guides, roosting places were located and several specimens, mostly immature males without well developed "tails," were obtained. It was found, however, that ordinary shotgun loads, such as might be used for geese, were seldom effective against the big birds and it was necessary to use buckshot. Once, after very careful stalking, I felt quite certain that I was under the large tree in which a bird was perched. The foliage was rather thin and, although it was fairly dark, everything was outlined against the sky. For some five minutes I scanned the silhouetted branches one by one and finally concluded my game must be in the next tree beyond, but when I started toward it, the bird crashed out behind me from almost directly over my head.

Through a reward offered the natives, one nest was found. This contained five heavily incubated eggs (on April 5) and was situated under a spiny palmetto at the edge of a small clearing. To visit it required a hot walk of five miles and back, guided by barefooted Radays over narrow trails and through dry crackling thickets of bamboo. The female was found sitting on the eggs, and as we approached a male bird was seen slipping away from the vicinity. The eggs lay in a slight hollow at the base of the palmetto, merely resting on loose soil and debris without any evidence of nest building. While sitting, the bird was almost entirely concealed by the overhanging frond-like branches of the palmetto and the thick grass which grew about it.

RUN BETTER THAN THEY FLY

As the time for my stay in this locality expired, I found myself only with specimens of females and young male peacocks with short trains. A good adult male had not been secured although several had been seen. One fine bird had been observed with field glasses while it was displaying before a female, but it was some two hundred yards away and quickly disappeared. The old males doubtless roost in trees like the others, but the long heavy train is evidently a handicap and they do not take to flight readily, preferring to escape by running, and at this they were most competent. Although they were seen foraging in open fields, their stomachs were found to contain large seeds, nuts, and miscellaneous mast plainly obtained by ranging the forest floor.

Most of our hunting had been done on foot, but although there were no roads, we were able in the dry season to get about with a car kindly supplied by Mr. Gordon Smith, over trails made by the natives and connecting their villages. On leaving, therefore, we took a somewhat roundabout route in a final hope of seeing another peacock. Within a few miles one was sighted not too far from the edge of an old rice field. Having failed so often under similar circumstances, I readily accepted Mr. Smith's offer to try for it. So I sat in the car, waiting while he made a long detour and crawled to the edge of the field. Some fifteen minutes after he had gone, I was suddenly brought up standing by the sight of a magnificent peacock carrying a long train and slipping across the trail less than two hundred yards in front of me. Probably, but not certainly, it was the same bird my companion was stalking. At least it was apparently on the go, and although I was thrilled at the sight of it, I felt that it was hopeless to try to follow it under the circumstances, and that our last chance had gone.

SUDDEN GOOD LUCK

A few minutes later, as we drove down the trail and I was pointing out the place where the bird had crossed, we were both amazed to see the bird standing in the light scrub not twenty yards away. A quick shot through the open windshield wounded it, and as it started away we leaped from the car and after it just in time to bring it down with another load. It slumped down with its wings slightly spread, its neck extended, and its gorgeous train glittering in the tropical sun. I walked up to it as it lay against a background of light brown bamboo litter and fairly gasped at the beautiful sight before me.

The satisfaction of securing this fine specimen was somewhat qualified by the difficulties of transporting and preserving it. Although the weather was dry, it was very hot and at the time I was entirely without assistance. The next day it was safely skinned, but for a week thereafter ministering to it was a constant burden at a time when I was obliged to be traveling from place to place.

Photographs and samples of vegetation were taken at and near the site of the nest in the expectation that they would be reproduced in a habitat group, but practical considerations dictated a different installation and, as illustrated herewith, the group now completed in the Museum shows the birds in roosting position overlooking the forest, instead of guarding their nest. The birds were mounted by Staff Taxidermist John W. Moyer; the numerous accessories are by Mr. Frank H. Letl, Preparator of Accessories; and the painted background is by Staff Artist Arthur G. Rueckert.

The form and color of such soft-bodied invertebrate creatures of the sea as jellyfish, sea-anemones, and sea-cucumbers may be studied in a series of accurate reproductions in glass, on exhibition in Hall M.

NAVAJO INDIAN METHODS OF CURING SICKNESS

A few years ago a group of Navajo Indians visited Field Museum. While viewing the exhibits they discovered a complete set of Navajo Night Chant masks which are exhibited in Hall 6, Case 11. The Indians were at first not at all pleased to find their sacred masks in a glass case. Dr. Paul S. Martin, Chief Curator of Anthropology, mollified his guests by explaining that the masks had not been used in any ceremony. He explained that the white man is curious about the Navajo's religion, and eager to learn about it. Further to pacify the tribesmen, Dr. Martin assured them that none of their sacred secrets had been told, and that he himself knew little about the Night Chant Ceremony. The gratified Navajos then volunteered to tell the anthropologist more.

The Navajo Night Chant Ceremony lasts ten days and nine nights. It is invoked primarily for curing disease by means of supernatural forces. The ceremony is performed during the frosty days of late autumn and early winter. This time is chosen because the snakes are then hibernating.

The priest or chanter who performs the ceremony seldom conducts any other ritual, for it takes years to learn the Night Chant. A single error in any part of the chant means that the entire ceremony must start again.

The ceremony costs the equivalent of from $200 to $700, depending upon the fame and ability of the healer-priest. The family of the patient must build the medicine lodge, and provide food for all of the guests as well as for chanters, sand-painters, and others.

This cure often takes the entire savings of a family, but the expenditure is gladly made both because it is hoped the sick one will recover and because the occasion is a great social event.

On the fourth night a vigil is kept over the masks of the type that the Museum possesses. The patient sacrifices to the masks by sprinkling pollen upon them. Next is the love-feast of men and gods, the gods being fed first by feeding the masks. After this the shaman smokes to the masks. He puffs smoke to the earth and to the sky four times and then to each mask individually. The last part of the prescribed ceremony of the masks is the shaking of the gods. Each mask is picked up, shaken gently, and sung to. At dawn the masks are ceremoniously laid away in sacred recesses, to be used again whenever ritual demands.

The last night is the famous Yeibichai dance, which is attended by other Navajos and by people from all over the country. Whether or not the patient is better, the dance which marks the end of the ceremony, must go on.

The patient is given instructions which must be obeyed during the period of convalescence. If these are not carried out, it is believed the disease will return.

MUSEUM ACQUIRES COLLECTION OF 15,000 BEETLES

By RUPERT WENZEL
ASSISTANT CURATOR OF INSECTS

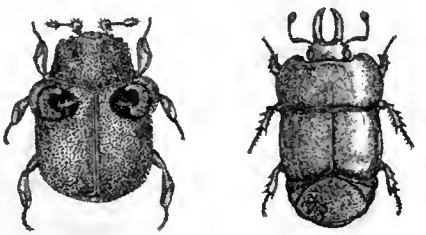
Because of the small size and retiring habits of most beetles, few people realize that they constitute nearly half the known insect species, nor are they aware of the tremendous number of beetles already known to science—between three and four hundred thousand species! This huge aggregate has been divided into nearly two hundred families, many of which are world-wide groups with thousands or tens of thousands of distinct forms. One of the smaller groups, and a very interesting one, is the family Histeridae, commonly known as the hister beetles or histerids.

HISTERIDS ARE "INSECT-ACTORS"

The hister beetles are supposedly named after the Latin *histrio*, meaning an actor, because of their habit of assuming a death-like attitude when disturbed. They are distributed throughout the world, with the exception of the very cold regions, and are recognizable by their clubbed and elbowed antennae, their very compact form, and exceedingly hard body surface. On the whole, specific details concerning their biology are lacking, though it is known that most of the species are carnivorous and extremely voracious feeders. They are frequently found in decaying animal and vegetable matter and under bark, where they feed on the larvae of flies and other insects. Because of their role as predators, a few species have been used in biological control work in fighting destructive insects.

While more or less uniform in their feeding habits, the nearly four thousand known species have evolved in adaptation to a number of diverse habitat niches. Certain species are found only in the nests of ants (occasionally of termites), where they are believed to feed almost entirely on the immature stages of their hosts. The beetles are tolerated in the nests because they produce glandular secretions which exude from special structures on the body surface and are eagerly sought after by the ants. The histerids which live under bark are usually very much flattened, in order that they may move with ease in their restricted living quarters. Others are of a cylindrical shape and live in the round burrows of certain wood boring beetles, upon whose young they prey. A few hister beetles are known to occur only in the burrows of particular rodents (a kangaroo rat and a pocket gopher) and even in the burrows of the land-dwelling turtle of Florida. The exact role which these beetles play is not understood, but it is believed that they feed upon the larvae of other insects which are restricted to these burrows. Other distinctive habitats where histerids may be found include birds' nests, caves, fungi, soil, etc.

It is of great entomological interest that Field Museum recently acquired the most extensive collection of hister beetles in the Americas, a collection which represents an accumulation by purchase and exchange over a period of twenty years by Mr. Charles A. Ballou, Jr., former New York publisher. Mr. Ballou had at one time intended to monograph large sections of the family but was forced to sacrifice his interest because of ill health and lack of time. While the collection is not a large one as compared with general insect collections, nevertheless the 15,000 specimens contained in it represent approximately half the known species of hister beetles of the world, as well as many undescribed ones. It is particularly rich in its representation of North American, Indo-Australian, Asiatic, European, and African species. An excellent opportunity for systematic research on this family is thus afforded, and the collection will be still further enriched by field collecting and exchange.



HISTER BEETLES

Two of the remarkable types of adaptation found in insects of this group. The species on the left is a bizarre Australian form which lives in the nests of ants. On it may be seen the secreting structures which attract the ants and induce them to tolerate the beetle "guests." On the right, from Burma, is a flattened form which lives under bark. Similarly adapted beetles occur in the Chicago area.

It is perhaps interesting that such private collections tend to gravitate to the larger museums, and it is highly desirable that they should do so. Only in this way can they avoid being dispersed, destroyed, or even lost after the death of the collector. The first collection of this kind acquired by Field Museum was the Strecker collection of butterflies and moths, numbering fifty thousand specimens.

Making Gold "Grow"

An interesting superstition attaches to a group of tektites from the Philippine Islands recently presented to the Museum. These tektites are glassy nodules of mysterious origin believed by many to be meteorites. Dr. R. F. Barton, who presented them, writes, "They were being used by native gold panners of that place (Batobalani, Philippine Islands) to 'increase' their pannings. They put the gold away in a dark place with the stone and believed the stone increased it. Down there they call them *binso n di ginto* or *asauwa n di ginto* (wife or companion of the gold)."

The specimens are shown with other tektites in the west end of Hall 34.

EXPEDITION TO MAKE STUDIES ON AGE OF PANAMA ISTHMUS

An expedition which has as one of its objectives the determination of the date at which the Isthmus of Panama emerged from the sea, is to be dispatched to Central America about November 1. The expedition will be led by Mr. Paul O. McGrew, Assistant Curator of Paleontology. He will be accompanied by Mr. Albert Potter, of Chadron, Nebraska, an experienced collector of fossils who has worked in various fields of South Dakota, Nebraska, Wyoming, and Arizona.

"At present the opinions of paleontologists are divided on the question regarding the emergence of the Isthmus of Panama," states Mr. McGrew. "We know that North and South America were separated during most of the Tertiary period (which began about 55,000,000 years ago). There is some indication that the two continents were reconnected, via Central America, near the beginning of Pliocene time (approximately 7,000,000 years ago), but also there is evidence that the land bridge was not present until the end of Pliocene time, some five or six million years later.

"A solution of this problem would help solve other related problems concerning the migration of mammals in the geologic past. It is believed that a study of mammals of Pliocene age from Honduras, rather near the ancient marine portal, would help materially in answering this question."

A second objective is the determination of the significance of homotaxis in the correlation of widely separated faunas. Homotaxis is explained by Mr. McGrew as follows: "There is a rather well founded theory that at least a large part of a geologic epoch was required for faunas to migrate from a center of dispersal, in the north, to the tropics. Thus, if two forms that had reached the same evolutionary level were found, one in Central America and one in the great plains of the United States, the beds in which the former occurs would be later in geologic time than the latter. This is an important hypothesis which may or may not be true. As yet few actual data are available to check it. Study of fossil mammals from Central America might afford enough evidence to clarify this point."

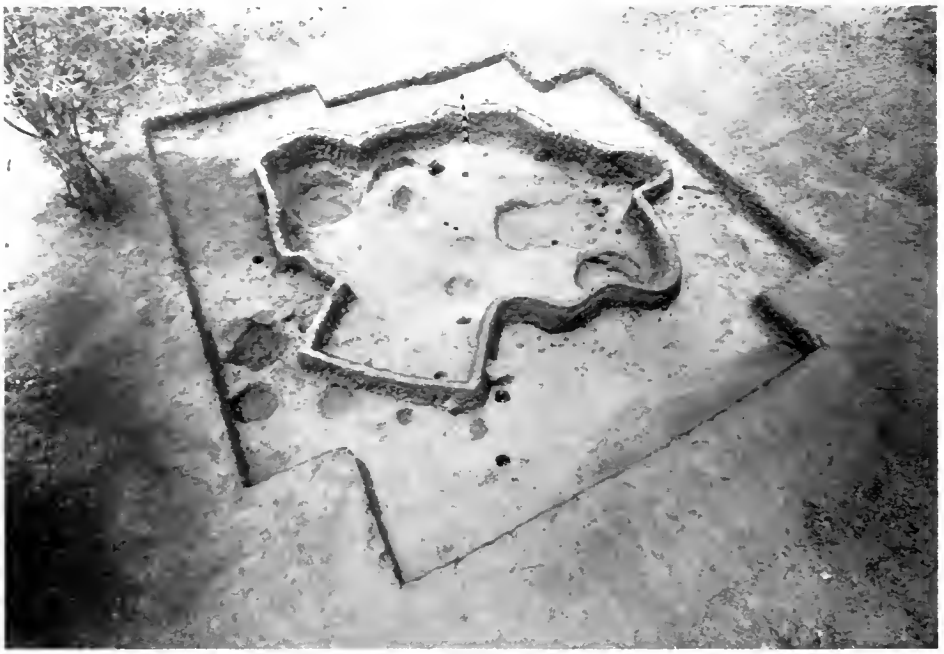
The expedition will sail from New Orleans to Puerto Cortez, whence the members will fly to the capital, Tegucigalpa, and thence to the town of Gracias. From Gracias the explorers will use mules for transportation while doing their field work.

The overland trade routes of ancient and medieval times, and the chief centers of origin of the world's principal food plants, are shown in two large maps included among the series of seventeen mural paintings in Hall 25 illustrating various phases of man's quest of vegetable food.

EXPEDITION DISCOVERS NEW PREHISTORIC HOUSE TYPE

By PAUL S. MARTIN
CHIEF CURATOR, DEPARTMENT OF ANTHROPOLOGY

After several months spent in excavating the ruins of an ancient New Mexico village which was occupied sometime between 1,200 and 2,400 years ago by a prehistoric American Indian people belonging to what we call the Mogollon (pronounced "muggy-own") civilization—a culture which has been recognized only within the last few years—the Field Museum Archaeological Expedition to the Southwest has completed its 1941 season of operations and returned to Chicago. The expedition, under the leadership of the writer, was a continuation of his work on one previous expedition in the same area, and eight previous expeditions for investigation of related cultures in other regions of the Southwest. Personnel included other archaeologists, research assistants, and a "labor force" of twelve workingmen for the actual digging.



STRANGE DESIGNLESS TYPE OF ANCIENT HOUSE LAID BARE

Aerial view of one of the areas excavated by the 1941 Field Museum Archaeological Expedition to the Southwest. The irregular lines of the inner enclosure mark the odd meandering walls of the hitherto unknown sort of dwelling place just discovered by Dr. Paul S. Martin and his associates. The giant geometrical pattern formed by the outside lines illustrates the technique of "stripping" employed this season as a means of assuring the finding of the site's every buried artifact.

Approximately 600 stone and bone tools and 18,000 potsherds (pieces of broken pottery) were brought to light on the site excavated, which has been designated by the name SU*. The stone and bone tools are of an early type, and the pottery is crude and without decoration. These rare specimens, together with the facts gleaned during the digging season, will be further studied and correlated for a detailed report within the next five or six months.

*SU (pronounced "Shu") is the brand mark used on cattle at a large ranch near-by, and has become the name also of one of the canyons in the region.

Meanwhile, it is possible to make a few general statements and to sketch hastily the meaning of the season's work:

Was the expedition a success? Emphatically, yes. Did we bring back any showy specimens? No; but such acquisitions do not constitute a proper criterion—archaeology is not a search for specimens, and emphasis on them indicates a lack of perspective on "what it's all about." Archaeology is, instead, a study dealing with man's history. Archaeologists try to recover and interpret man's past; and in order to carry out this purpose they excavate. In the digging of a ruin in the Southwest, one finds tools of stone and bone, and generally pottery and houses. These tangible remains of the culture form the basis for reconstructing man's past, and in this respect specimens achieve their prime usefulness. It should always be remembered that probably 90 per cent of a civilization dies when a village or town is deserted. From the dust, the archaeologist cannot recover the language spoken by the villagers, the dress, the social customs, and a thousand and one other items that make up any culture. We can, however, by careful study and observation make reasoned and reasonable guesses about the past.

Why was the Mogollon civilization chosen for study?

We are interested in studying the Mogollon civilization for many reasons. It represents an early stage in the development and growth of towns situated in fertile agricultural areas. The United States government at the present time encourages isolated farmers to gather in or near centralized communities, where they may benefit from better social, psychological, and educational environments. To know whether such an experiment would be successful today, one must study the past.

We are also interested in the religious, social, and economic structures which the Mogollon Indians developed long ago; for an understanding of these fundamentals may guide our footsteps on the right path to realize man's eternal urge for progress.

Furthermore—and this is what so closely links the present with the past and gives one a warm, comfortable feeling that one is not an isolated phenomenon on this globe without antecedents or successors—we are interested in showing that in spite of differences in time, climate, race, and geography, men possess certain fundamental urges which cause them to act more or less similarly at all times and in all places. Thus we can easily see a sameness of development throughout all civilizations.

Therefore, our reasons for digging at the SU site are clear. We wished to learn how these primitive folk lived, how they grouped themselves socially, how they solved their economic, agricultural, and religious problems, and why and how they lived in clusters of houses or villages. We desire this information because we must understand man in both past and present if we are to understand our own civilization and how it may be improved.

THREE MAIN SOUTHWEST CULTURES

Until a few years ago, archaeologists believed that there was only one civilization in the Southwest and that it produced all the various types of pottery, houses, and tools that we dug up. We now know that this idea was incorrect. Within the last few years archaeologists have demonstrated that there were two other civilizations which left their mark on the Southwest. The one most recently laid bare is the Mogollon civilization, towards the discovery of which the Field Museum Archaeological Expeditions have greatly contributed.

What was the Mogollon civilization like?—what were its chief characteristics? The Mogollon civilization was a comparatively poor one. The people of this culture lived for the most part in pit-houses, which were nothing but big holes in the ground, roofed with logs, twigs, bark, and earth.

We discovered also that, in addition to pit-houses, the Mogollon Indians built and occupied other houses, the floors of which were not sunk into the ground. The walls of these consisted of upright poles set eight to fourteen inches apart. Mud and small sticks were placed in between these poles, forming a good tight wall. This kind of construction is called "wattle-and-daub"

and contrasts with the below-ground houses found by the 1939 expedition to this site.

Firepits were not found in any of the houses. Therefore, we believe that these Indians rarely used fire inside the house for cooking, warmth, or light. Extensive digging outside the houses likewise failed to bring to light any firepits, but large deep pits were discovered and perhaps these were used for barbecuing; or perhaps these people did little or no cooking.

Most of the houses were equipped with large or small entrance-tunnels which always faced east. Why these tunnels faced east is not known, although probably the orientation was for religious reasons.

Life in the underground houses must have been somewhat dark, and perhaps damp and not very comfortable. At some future time we hope to reconstruct a roof over one of the old pits, let it stand for several weeks, and then burn it. In this way, we may be able to learn the answers to some of these puzzling questions.

The stone and bone tools of the Mogollon Indians were crude and unlike those which one ordinarily associates with Indians. In fact, the stone tools, such as scrapers, choppers, hammerstones, polishing stones, and pestles, are so primitive that one would probably pass them by without recognizing that they had ever been used by human beings for any purpose whatsoever. But, finding many such stones in all the houses caused us to note that they fell into distinct patterns and types and therefore could not be natural, unused stones.

It is interesting to note that no axes of any kind were found. The absence of this important tool makes us wonder how these ancient Mogollon people felled their trees, for we know that they used fair-sized trees for roofing their houses.

BURIALS

The dead were always buried in pits. Some of these lay outside the houses, and some were dug in the house floors. The corpse was wrapped in a sitting or doubled-up position and was then placed in a pit. Generally, burials were not placed in house pits until after the house had been abandoned. But in some instances the family continued to live in the house after a burial, presumably of a family member, had been placed in a floor pit. Of course, the burial was covered with earth, and the floor was thus completely restored. Offerings to the dead were very rare. The only objects we found with skeletons were tobacco pipes and sometimes shell bracelets and necklaces. Whole pottery was never found, which may be an indication that pottery had only recently been adopted by this civilization and was therefore not yet really part and parcel of it.

The human skeletons themselves were in a very poor state of preservation, while animal bones found in the same excavation level were sound and well-preserved. This may indicate that the animals obtained a better-balanced diet than the Indians of that period.

FOOD

During the season, only a few projectile points (arrow- and spearheads) were found. On the other hand, many food-grinding tools were brought to light in great abundance from all houses. It is assumed, therefore, that the Mogollon Indians of the SU village lived mostly on berries, roots, herbs, and grasses, and depended very little on hunting or agriculture. This may also be a sign that this civilization is ancient, as the people were mostly seed-gatherers rather than farmers.

AGE OF THE SU RUIN

The age of the houses, pottery, and stone tools which the Field Museum Expedition discovered at the SU Village is difficult to determine. Dating the village by means of tree-rings has thus far been impossible because the rings on timbers from the ruins do not fit into any known sequence. Some light on this question can be obtained by means of cross-dating or comparison of the Field Museum tools with those from other ruins. It is known, for example, that the SU ruin is earlier than A.D. 700 because no painted or decorated pottery was recovered during the season. Painted pottery occurred in that area after A.D. 700. The pottery which we found is probably among the oldest in North America.

Conversely, although the SU village stone tools are similar to those found in southern Arizona by Gila Pueblo investigators (in the San Pedro time period which dates at about 3000 B.C. to 500 B.C.), yet the SU village must date after that period because the SU villagers made pottery while the San Pedro people did not.

Therefore, the Field Museum village must have been founded and occupied sometime between 500 B.C. and A.D. 700.

INVERTEBRATE FOSSILS OBTAINED

Dr. Sharat K. Roy, Curator of Geology, has returned from a two and one-half months' expedition to western and northern New York where he collected exhibition specimens of invertebrate fossils, chiefly from the Upper and Middle Devonian formations. Dr. Roy limited his field work to type localities and for the most part collected only those specimens that were needed to fill some of the gaps existing in the Museum's collection. The bulk of the material is intended for the exhibits in Frederick J. V. Skiff Hall (Hall 37), which is scheduled to be reinstalled as soon as a more complete representative collection showing the stratigraphical and biological sequence of the Paleozoic periods can be made. Duplicate specimens will be added to the study collection, and new species will be the subject of research and publication.

ECONOMIC BOTANIST DEPARTS ON VENEZUELAN EXPEDITION

Arrangements have been completed for a joint Field Museum–Venezuelan Government botanical expedition to the upper Orinoco. It will be conducted by Mr. Llewelyn Williams, Curator of Economic Botany, who sailed late in October. The territory south and east of the Orinoco River, generally known as the Venezuelan Guiana, has been visited or traversed by famous scientists, but nevertheless it is still regarded as one of the least explored areas of tropical America.

This is the third expedition to the Venezuelan Guiana to be conducted by Mr. Williams. Early in 1939 he spent several months in the lower and middle reaches of the Caura, one of the principal affluents of the Orinoco, and from March to July of the following year he botanized in various widely separated areas ranging from near the delta of the Orinoco to the rapids of Atures, almost 1,000 miles up-river.

In December Mr. Williams plans to leave Caracas for Ciudad Bolívar, where he will embark on a small sailing vessel for a 10-day voyage to Puerto Ayacucho, the limit of river navigation by vessels of deep draft. Beyond this point he will travel in dugout canoes, with several portages around rapids, to Yavita and overland to the River Guainia, which empties into the Río Négro, continuing to the Brazilian frontier at El Cucuy. The return will be made by way of the Casiquiare and the Orinoco.

One of the greatest collections of weird and grotesque artistry in the form of carved wooden figures is to be seen in the Melanesian collections in Joseph N. Field Hall.

FIELD MUSEUM HONOR ROLL

Now in the Service of their Country:

Theodore Roosevelt, Trustee—Colonel, U.S. Army, commanding 26th Infantry, Fort Devens, Mass.

Joseph Nash Field, Trustee—Ensign, U.S. Navy, Headquarters, 9th Naval District, Great Lakes, Ill.

Clifford C. Gregg, Director—Major, U.S. Army, Assistant Adjutant General, 6th Corps Area, Chicago.

Melvin A. Traylor, Jr., Associate, Birds—Private, U.S. Marine Corps, Training Base, San Diego, Calif.

Patrick T. McEnery, Guard—Master-at-arms, U.S. Navy, Training School, Navy Pier, Chicago

John Syckowski, Guard—Chief Commissary Steward, U.S. Navy, 9th Naval District, Great Lakes, Ill.

George Jahrand, Guard—Chief Water Tender, U.S. Navy, 9th Naval District, Great Lakes, Ill.

Field Museum of Natural History

FOUNDED BY MARSHALL FIELD, 1893

Roosevelt Road and Field Drive, Chicago

TELEPHONE: WABASH 9410

FIELD MUSEUM NEWS

EDITOR

CLIFFORD C. GREGG ..... *Director of the Museum*

ASSOCIATE EDITOR

WILFRED H. OSGOOD ..... *Curator Emeritus, Zoology*

CONTRIBUTING EDITORS

PAUL S. MARTIN ..... *Chief Curator of Anthropology*
B. E. DAHLGREN ..... *Chief Curator of Botany*
HENRY W. NICHOLS ..... *Chief Curator of Geology*
KARL P. SCHMIDT ..... *Chief Curator of Zoology*

MANAGING EDITOR

H. B. HARTE ..... *Public Relations Counsel*

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

HARDEKOOL OR "LEADWOOD"

In 1932 there arrived at Field Museum a heavy piece of wood, a cross-section of a trunk without bark. It was painted on both cut surfaces to insure slow and even drying, and was stenciled with the name of the Vernay–Lang Kalahari Expedition, which had then recently visited Bechuanaland in South Africa. The expedition had transmitted to the Museum many specimens, but the various lists made no mention of a piece of wood weighing at least 100 pounds. It was assumed that in the course of time some information about it would be forthcoming. The painted chunk of wood was therefore placed in storage.

There it remained until recently when it was decided to remove enough of the white paint with which it was coated to permit an inspection of the cut surface of the now perfectly dry specimen. The wood was found to be extremely hard, and the heavy block, when cleaned, resembled a piece of lignum-vitae of enormous size. An examination of the literature on hand concerning the woods of South Africa quickly gave a clue to its identity. In color, weight, and other characters it corresponded to the description of the "ironwood" (or, because of its weight, "leadwood") of the region visited by the expedition; and it was therefore identified as a specimen of *Combretum imberbe* of the buttonwood family. By the Africanders this wood is called "hardekool."

Less than two inches of light-colored sapwood enclose a dark brown heart 26 inches in diameter. Like lignum-vitae, the heartwood is so dense it is said to be useful for slow speed machinery bearings and to have served the natives as material for hoes before the advent of iron, whence the name "rooiblad" applied to the wood of this and a closely related species.

The specimen is now on exhibition among the African woods (Case 438) in the Hall of Foreign Woods. —B.E.D.

Museum Admissions Are Now Taxed; Children Still Admitted Free

It has become necessary for Field Museum to charge a federal admission tax of three cents in addition to the regular twenty-five cents admission fee for adults on Mondays, Tuesdays, Wednesdays, and Fridays, because the revenue act of 1941, recently enacted by Congress and effective since October 1, removes the exemption from tax on admission charges which formerly applied to religious, educational and charitable organizations, and all other hitherto exempt beneficiaries. The free days, Thursdays, Saturdays, and Sundays, are unaffected by the provisions of the new legislation.

The Museum will continue to admit school children free. Also, students and faculty members of recognized educational institutions will be admitted free on all days upon presentation of proper credentials, although the Museum will itself be required to pay the three-cent tax on such admissions, and on all children over twelve years old, on the days when charge is made to other persons. Likewise, all Members of the Museum will retain the privilege of free admissions for themselves, families, and their guests. Admission will continue to be free on all days to members of the armed forces of the United States, in uniform, whom the law specifically exempts from the tax.

Staff Notes

Dr. Francis Drouet, Curator of Cryptogamic Botany, reports that he has nearly completed the work of the expedition which he has been conducting since August in Utah and in various parts of California. Large collections of algae, especially of deserts and hot springs, have been made. Dr. Drouet is now studying the cryptogamic plant life of the Mojave Desert and the Imperial Valley. Mr. Donald Richards, his volunteer companion on the expedition, has returned with a large part of the collection.

Mr. J. Francis Macbride, Associate Curator of the Herbarium, who is engaged in work on the *Flora of Peru*, is at present studying the Andean collections in the herbarium of the University of California.

Dr. Henry Field, Curator of Physical Anthropology, has resigned, effective October 1, 1941.

Field Museum Staff Lecturer Aids Trailside Museum

Mr. Bert. E. Grove, a member of the lecture staff of the James Nelson and Anna Louise Raymond Foundation at Field Museum, has organized and is now conducting a group of natural science clubs at the Trailside Museum of River Forest, Illinois, at the request of that institution. The Trailside Science Clubs meet every Saturday afternoon in a special laboratory. Some of the groups are for children, some for adults.

The purpose of the clubs is to foster, by means of laboratory projects and field trips, a deeper interest in the sciences of botany, geology and zoology. Those joining the clubs first take a three weeks' course in laboratory technique to become familiar with the use of microscopes and other necessary equipment and materials, after which they receive the designation "Junior Scientists." At a recent meeting, Miss Elizabeth Best, also of the Raymond Foundation staff, demonstrated dissection and taxidermy methods. Miss Virginia Moe, Curator of the Trailside Museum, co-operates in promoting the club work.

Ancient Rome and Etruria

Roman and Etruscan antiquities in great variety are to be found in Edward E. and Emma B. Ayer Hall (Hall 2). Truly worthy of admiration are the simple, strong, and yet highly artistic and utilitarian qualities of many of the objects. The Roman bronzes, and the Etruscan sarcophagi and funerary couch merit special attention, and the Roman wall paintings are unique among American collections. Especially attractive also is a fine exhibit of ancient glass objects.

A FEW FACTS ABOUT FIELD MUSEUM

Field Museum is open every day of the year (except Christmas and New Year's Day) during the hours indicated below:

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

Admission is free to Members on all days. Other adults are admitted free on Thursdays, Saturdays, and Sundays; non-members pay admission on other days: Established price 25 cents, Federal tax 3 cents, total 28 cents. 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 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 at 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.

Free courses of lectures for adults are presented in the James Simpson Theatre on Saturday afternoons (at 2:30 o'clock) in March, April, October, and November.

A Cafeteria serves visitors. Rooms are available also for those bringing their lunches.

Chicago Motor Coach Company No. 26 busses provide direct transportation to the Museum. Service is offered also by Surface Lines, Rapid Transit Lines (the "L"), interurban electric lines, and Illinois Central trains. There is ample free parking space for automobiles at the Museum.

FIVE MORE CHILDREN'S PROGRAMS OFFERED DURING NOVEMBER

Five more free programs of motion pictures for children remain to be presented during November in the autumn series presented by the James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures. These programs, to which children from all parts of Chicago and suburbs are invited, will be presented twice each Saturday, at 10 A.M. and at 11, in the James Simpson Theatre of the Museum. No tickets are needed for admission. Children may come alone, accompanied by adults, or in groups from schools, community centers, or other organizations.

Following is the complete schedule:

November 1—MEXICO, OUR SOUTHERN NEIGHBOR; and a cartoon.

November 8—LIFE IN OUR SOUTHWESTERN DESERT; and a cartoon.

November 15—WILD ANIMALS (*color motion pictures and lecture by Sam Campbell*).

November 22—CANADA, OUR NORTHERN NEIGHBOR; and a cartoon.

November 29—THE RIVER NILE, EGYPT'S LIFE LINE (*from the time of the mummies*).

THINGS YOU MAY HAVE MISSED

Moss Agate or Scenic Agate

The delicate tracery of moss agate, like the beautiful patterns of frost on window panes, often so closely resembles the finest ferns that it is difficult to believe at first glance that it is entirely inorganic.

The specimen shown here is representative of dozens in the gem collection of Field Museum, many of which are included in a special display in Case No. 5-A in H. N. Higinbotham Hall (Hall 31). No two specimens of scenic or moss agate show exactly the same pattern, yet all were formed in much the same way.

The mineral chalcedony, under which all varieties of agate are included, is common, beautiful, and has long been known. The name was used by Agricola as early as 1546 and is derived from the region "Chalcedon" in Asia Minor. This mineral is mentioned in the Bible (Book of Revelation) as one of the foundation stones of the Holy City.

Chemically, chalcedony is composed of silica and water. It has microcrystalline structure, is characteristically waxy in luster, and is usually translucent. Moss agate and scenic agate result from the spreading of dark mineral matter in light colored chalcedony. This dark material is usually the mineral pyrolusite, the oxide of manganese, but in certain brown varieties the coloring matter is iron oxide in the form of the minerals hematite or goethite.

Chalcedony forms at low temperatures in cavities or fissures in rocks by the precipitation of silica from solution. It is thought that this silica usually exists as a gel before it becomes solid. The dark matter may be introduced at this time and may diffuse in a delicate branching pattern through the gel—much as cream will diffuse through coffee. In other cases the dark matter appears to have been introduced into cracks in the already hard chalcedony, and to have diffused much as a drop of ink will spread in a moss-like pattern between two sheets of glass or paper.

In former times the best moss agates were found in India and were known as "Mocha Stones," a name which may refer to Mocha in Arabia or may be a corruption of the English name "moss-agate." In recent years the best specimens, including all of the scenic and so-called "landscape" agates, have come from Montana, Wyoming and Oregon. —B.M.

MINIATURE LANDSCAPE INSIDE A STONE

Example of moss (or scenic) agate from among those in a display in H. N. Higinbotham Hall of Gems and Jewels.

INSECT COLLECTION FROM MEXICO

Mr. Henry Dybas, Assistant in the Division of Insects, returned to Field Museum recently after three months of collecting insects in Mexico in company with Dr. Charles H. Seevers, of the Department of Zoology, Central Y.M.C.A. College, and Mr. David Bergstrom. The party traveled by automobile and made short stops of a few days or weeks at various localities which ranged from semi-arid country to luxurious tropical forest. Most of the collecting was done in the regions of Cordoba, Vera Cruz, and the country to the south.

The material obtained by Mr. Dybas, now acquired by Field Museum, numbers over 17,000 specimens, mostly beetles. Some of the most interesting of these are three thousand fungus-dwelling beetles of the family Ptiliidae. They are the smallest beetles known, measuring half a millimeter in length (one-fiftieth of an inch) and are especially adapted to an existence within the spore tubes of bracket fungi, where both larvae and adults apparently feed upon the soft, growing spores. They constitute one of the least known of all insect groups, and the Mexican specimens collected by Mr. Dybas probably represent twice as many species as were previously known from all parts of the world.

SATURDAY LECTURES CONTINUE THROUGH NOVEMBER

During November five of the lectures in the annual autumn course for adults will be presented on Saturday afternoons. All are to be given by men eminent in various fields of exploration and research, and all are illustrated with motion pictures, largely in natural colors. Admission to all the lectures is free of charge.

The lectures are to be given in the James Simpson Theatre of the Museum, and each will begin at 2:30 P.M. All of them will be illustrated with motion pictures, in many cases by films in natural colors. The demand for seats makes it necessary to restrict admission to adults; but on the mornings of the same Saturdays the James Nelson and Anna Louise Raymond Foundation will present free motion pictures especially for children. The theatre entrance will be open for the adult lectures at 2 o'clock each Saturday.

Following are the dates, subjects, and speakers for the adult programs:

November 1—FROM SEASHORE TO GLACIER.
Karl Maslowski.

November 8—NEW WORLDS UNDERSEA.
Vincent Palmer.

November 15—FLORAKEYS.
James B. Pond.

November 22—PAN AMERICAN HIGHWAY.
James Sowders.

November 29—THROUGH THE RAINBOW.
Stuart D. Noble.

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. Requests for these seats should be made in advance by telephone (WABash 9410) or in writing, and seats will be held in the Member's name until 2:30 o'clock on the day of the lecture. All reserved seats not claimed by 2:30 P.M. will be made available to the general public.

Wisconsin and Michigan Children Visit Museum in Large Groups

Large groups of school children from Illinois communities outside Chicago, and from near-by states, are being brought on an ever-increasing scale to Field Museum for comprehensive tours correlating with their scientific studies. Among notable groups recently received were 1,150 rural pupils of the schools of Rock County, Wisconsin, brought to the Museum on October 9; and 1,400 from the schools of Allegan, Michigan, who came on October 16. The Wisconsin children were conducted on Museum tours by their own teachers; the Michigan group made tours led by guide-lecturers of the Raymond Foundation.

LAYMAN LECTURES ON SUNDAYS TO BEGIN THIS MONTH

On Sunday, November 2, and each succeeding Sunday in November, Mr. Paul G. Dallwig, the Layman Lecturer of Field Museum, will speak on "Gems, Jewels and 'Junk.'" This is the first of the seven subjects which he will present during his 1941–42 season of Sunday afternoon lectures, which will continue through next May.

The opening lecture will be illustrated with the exhibits in the recently opened new Hall of Gems and Jewels (H. N. Higinbotham Hall), and Mr. Dallwig will tell the story of many of the most famous precious stones in this hall, as well as giving a general outline on the subject of gems and jewels. It is Mr. Dallwig's aim to trace vividly for his audiences the course of precious and semi-precious gem stones from their original home in the mother rocks to their ultimate resting places in jewelry stores, museums, and individual jewel chests. He will also tell about the many superstitions that have led to the wearing of gem stones as talismans, amulets, and charms against evil and illness, as well as to bring good luck or to further the cause of love. In addition, he will tell how imitation and synthetic gem stones are produced, and how they may be tested to determine whether or not they are artificial in origin.

The heavy demand by the public for Mr. Dallwig's lectures, and the necessity of limiting each audience to 100 adults (*children cannot be accommodated*), make it necessary to require advance reservations. Persons desiring to attend are advised to apply several weeks in advance. Reservations will be accepted by mail or telephone (WABash 9410).

The Sunday afternoon lectures begin promptly at 2 P.M., and end at 4:30. There is a half-hour intermission midway for refreshments and smoking in the Cafeteria.

In December the subject of Mr. Dallwig's Sunday afternoon lectures will be "Mysterious 'Night-Riders' of the Sky"—the story of meteors, meteorites, and the moon.

GIFTS TO THE MUSEUM

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

Department of Anthropology:

From Mrs. Frank D. Gamewell, Philadelphia, Pa.—3 tribal costumes, China; from Mrs. Neva H. Farley, Minneapolis, Minn.—Chinese sherds from South China and the Near East, and one lot of Greek pottery; from Mrs. Mortimer Frank, Chicago—a painted figurine head, Mexico.

Department of Botany:

From José M. Ponce, Mexico City—37 specimens of Mexican oaks; from George Moore, Sullivan, Mo.—9 herbarium specimens, Missouri; from Dr. Erich F. Schmidt, Chicago—37 herbarium specimens, Iran.

Department of Geology:

From Steven Gulon, Chicago—one Mexican onyx heart, Argentina; from University of Chicago—skull and jaws of *Eporeodon*, Wyoming; from A. H. Becker, Madison, Wis.—5 specimens of anorthoclase moonstone, Wisconsin.

Department of Zoology:

From Charles B. Cory, Homewood, Ill.—a sora rail, Illinois; from Mrs. Erika Cook Bascom, Evanston, Ill.—4 lizards, Mexico; from Mrs. Eunice Gemmill, Glen Ellyn, Ill.—a screech owl, Illinois; from Mrs. Henry Dybas, Chicago—a starling, Illinois; from Chicago Zoological Society, Brookfield, Ill.—44 bird skeletons, 5 snakes, and a lizard; from Lincoln Park Zoo, Chicago—a bird skeleton; from John G. Shedd Aquarium, Chicago—166 specimens comprising approximately 93 species of fishes; from Mrs. Meriam Grey, Evanston, Ill.—66 specimens comprising 9 common shore species of fishes, and 31 specimens comprising 10 species of marine invertebrates, Maryland; from Donald Shaw, Homewood, Ill.—a fox snake, Illinois; from Dr. Thomas Poulter, Chicago—2 penguin skeletons, Little America; from C. M. Barber, Hot Springs, Ark.—a desert tortoise skeleton, Nevada; from Mrs. R. O. Grosjean, Fort Wayne and Angola, Ind.—a weasel and a star-nosed mole, Indiana.

The Library:

Valuable books from Metropolitan Museum of Art, New York; Stanley Charles Nott, Palm Beach, Fla.; Dr. Henry Field, Washington, D.C.; and Major Clifford C. Gregg, Dr. Fritz Haas, Henry W. Nichols, Dr. Julian A. Steyermark, Paul C. Standley, and Emil Liljeblad, all of Chicago.

NEW MEMBERS

The following persons became Members of Field Museum during the period from September 16 to October 15:

Associate Members

J. J. Allin, Joseph Dorocke, Jr., Mrs. Alfred Herz, Owen J. McAloon, John L. McInerney.

Annual Members

Archie Angelopoulos, F. C. Armbruster, Miss Jessie V. Behrens, Arthur A. Bransley, Edwin T. Breen, Dr. Elmo F. Brennom, W. B. Brodow, Morris Irving Cohn, Samuel Drucker, George P. Foster, Gustav D. Golding, C. G. Grove, William Hogenson, Victor T. Holmsten, Anthony S. Holub, Dr. M. B. Hopkins, Gilbert E. Humphrey, Mrs. Roy L. James, C. C. Jung, Joseph Kagan, Miss Lillian Kramer, John A. Leith, Mrs. Ellis R. Lewis, Alex W. Munro, Max Nierman, Sam Orner, Philip W. Pelts, Mrs. L. A. Randall, Mrs. Harry Schlossberg, Leo N. Soule, Jack C. Staehle, Haddon H. Sundblom, Charles Ross Wallace, Frank M. Whiston, Mrs. Elizabeth C. Wilson, Edward J. Wormley.

WEEK DAY LECTURE TOURS OFFERED IN NOVEMBER

Conducted tours of exhibits, under the guidance of staff lecturers, are made every afternoon at 2 o'clock except Saturdays, Sundays, and certain holidays. Following is the schedule for November:

Week beginning November 3: Monday—Hunting and Hunted Animals (Miss Elizabeth Best); Tuesday—General Tour; Wednesday—Before the Dawn of History (Bert E. Grove); Thursday—General Tour; Friday—South America, Its People and Products (Miss Elizabeth Hambleton).

Week beginning November 10: Monday—Plants Prepare for Winter (Miss Marie B. Pabst); Tuesday—General Tour; Wednesday—Ancient and Modern Landscapes (Bert E. Grove); Thursday—General Tour; Friday—What the Indians Gave Us (Miss Elizabeth Hambleton).

Week beginning November 17: Monday—Thanksgiving Foods (Miss Marie B. Pabst); Tuesday—General Tour; Wednesday—Relief Features of the Earth (Mrs. Leota G. Thomas); Thursday—Thanksgiving holiday, *no tour;* Friday—Chinese Arts (Miss Elizabeth Hambleton).

Week beginning November 24: Monday—Animals of the Jungles (Miss Elizabeth Best); Tuesday—General Tour; Wednesday Rocks and How Man Uses Them (Bert E. Grove); Thursday—General Tour; Friday—Plant Societies (Mrs. Leota G. Thomas).

Persons wishing to participate should apply at North Entrance. Tours are free. By pre-arrangement with the Director, special tours are available to parties.

MEMBERSHIP IN FIELD MUSEUM

Field Museum has several classes of Members. Annual Members contribute $10 annually. Associate Members pay $100 and are exempt from dues. Sustaining Members contribute $25 annually for six consecutive years, after which they become Associate Members and are exempt from all further dues. Life Members give $500 and are exempt from dues. Non-Resident Life Members pay $100, and Non-Resident Associate Members $50; both of these classes are also exempt from dues. The Non-Resident memberships are available only to persons residing fifty miles or more from Chicago. Those who give or devise to the Museum $1,000 to $100,000 are designated as Contributors, and those who give or devise $100,000 or more become Benefactors. Other memberships are Honorary, Patron, Corresponding and Corporate, 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.

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 for federal income tax purposes.

Endowments may be made to the Museum with the provision that an annuity be paid to the patron for life. These annuities are guaranteed against fluctuation in amount, and may reduce federal income taxes.

PRINTED BY FIELD MUSEUM PRESS

Field Museum News

Published Monthly by Field Museum of Natural History, Chicago

Vol. 12 DECEMBER, 1941 No. 12

STORY OF EARLY COFFEE TRADE DEPICTED IN MUSEUM MURAL

By B. E. DAHLGREN
CHIEF CURATOR, DEPARTMENT OF BOTANY

At a time when French ships in the Red Sea would be news, and when the sea-borne traffic to the Near East must resort to the long route by way of the Cape of Good Hope, one of the murals in Field Museum's Hall of Food Plants (Hall 25), viz., that of French Coffee Buyers in Arabia, appears to be of particular interest.

It recalls the centuries before the existence of the Suez Canal when the same sea-route, around the southern tip of the African continent, was the only one available for direct European commerce with the countries bordering the Indian Ocean, the Red Sea, and the Persian Gulf. Those who are at all historically minded will remember that even that route, now so important for the transportation of supplies to the British armies in the Near East and of American materials for Russia, has been known only since the time of the Portuguese navigators.

FRENCH COFFEE BUYERS IN ARABIA

Mural by Julius Moessel, in the Hall of Food Plants, showing a historic incident of about the year 1706 when water-borne commerce was established between Europe and the countries on the Indian Ocean, Red Sea, and Persian Gulf.

The painting depicts an historic incident in the early days of the water-borne commerce which followed upon the discovery of this route and not only made the West independent of the ancient caravan trade by bringing the products of all parts of the East directly to Atlantic seaports, but also, and fully as important, opened the way for an enormous increase in the world's supply of food and other products of vegetable origin by initiating a far-flung distribution of the useful plants of all continents.

Even at the present time, this process of transportation of economic plants from one part of the world to another is still going on. The Asiatic soybean, for example, grown in the Far East since times immemorial, is finding new and extensive areas of cultivation and (as described elsewhere in this issue) new uses in North America. Peruvian bark and the Brazilian rubber tree attained their present importance in the tropics of the Far East, whence after half a century of intensive cultivation they are now returned, improved and pedigreed, as stock for plantations in their original habitat.

The most spectacular, if not the most important, instance of the transposition of a cultivated plant from one part of the world to another far removed, is furnished by the history of coffee, to which Mr. Moessel's mural refers. Originally a native of the highlands of Abyssinia, where it was of relatively slight importance, the small tree which produces coffee beans had been introduced in southwestern Arabia some few hundred years before it attracted general attention. Though the beverage made from its roasted seeds had become popular there and its use had spread by way of Mecca to all of the Mohammedan world, it was not until it was sought by European buyers that coffee became considered an important article of commerce.

In Arabia the areas suitable for coffee

(Continued on page 2, column 1)

VISITORS SEE THE "INVISIBLE" IN MUSEUM EXHIBIT

By HENRY W. NICHOLS
CHIEF CURATOR, DEPARTMENT OF GEOLOGY

The Department of Geology has encountered and solved the problem of exhibiting specimens that, from their nature, are actually invisible. There are five rare gases present in minute quantities in the air. Like the principal components of the air, oxygen and nitrogen, they are absolutely invisible, and a bottle filled with them would appear empty. Although it is impossible to show them in their normal state, these gases can be made to glow with brilliantly colored light when they are excited by an electric current.

Through the courtesy of the Air Reduction Company it has been possible to exhibit tubes of these gases. Although the tubes appear empty in their usual state, they glow brilliantly with the most beautiful colors when the visitor presses a button.

These rare gases—argon, neon, helium, krypton and xenon—are peculiar in that they cannot be made to enter into any chemical combination. The most abundant, argon, is found in the air in the proportion of one part argon to 125 parts air, and the most rare, xenon, is present only in the proportion of one part to 1,700,000 parts air. Rare as they are, these gases have an important commercial value, for they produce the light of the numerous neon lights seen at night along many of our city streets.

MUSEUM TO CLOSE CHRISTMAS AND NEW YEAR'S DAY

in order to permit as many employees as possible to spend the holidays with their families.

STORY OF EARLY COFFEE TRADE

(*Continued from page 1*)

growing are limited to the slopes of the mountains and highlands adjoining the Red Sea just above the western tip of the peninsula, a narrow zone where climatic conditions and mountain streams make irrigation possible. The production of the none-too-extensive coffee gardens of the Arabs was necessarily limited, but that part of the crop which was not required for home consumption passed up the Red Sea or along its coast, and overland to near-by Mediterranean ports, either to Cairo and Alexandria, or to Acre, Jaffa, Tripoli or other cities of the eastern Mediterranean coast for transportation and sale to consumers in Damascus, Aleppo, or in Constantinople where coffee houses were opened in 1554.

In Europe coffee was unknown until travelers to the Levant returned with stories of the black drink, which, in the words of Francis Bacon, "comforteth the brain and heart, and helpeth digestion." From Constantinople coffee soon found its way to Venice. This and other commercial cities in the north of Italy obtained a supply from Alexandria for resale to western Europe and for a short time held a virtual monopoly of this as of other exotic products of the Near and Far East, until Marseilles on the French Mediterranean coast, also securing its supply from Alexandria, became the center for the coffee trade in France. The Dutch had in the meantime not been idle and regular shipments arrived in Amsterdam. Coffee was soon sold at public auctions there, in London, and in New York. Dutch traders obtained seeds from Aden and planted coffee in Ceylon, where it did not thrive, and later, more successfully, in the Netherlands Indies. In 1706 a coffee plant grown in Java was received in the botanic gardens at Amsterdam.

It was about that time that merchants of St. Malo, a small island off the channel coast of France, decided to dispute the French coffee trade with Marseilles and dispatched three ships directly to Arabia. The story of that expedition, which took several years, was told by Jean La Roque in his *Voyage de l'Arabie Heureuse*. How the enterprise of the St. Malo merchants afterwards led to the formation of the French India Company and how the ships of the French pioneers were followed by others, including chartered American clippers, belongs to the history of commerce and would take us too far afield.

The presentation to the king of France, a few years later, of a coffee plant raised from the seed of that in Amsterdam, is however, a link in the story of coffee, for the plant in the Jardin des Plantes in Paris was carefully described and well figured by the French botanist Jussieu, and seedlings derived from it and from the parent coffee trees in Amsterdam are said to have been the first to reach the West Indies. At any rate the French soon afterwards introduced coffee plants in Haiti and Martinique; the Dutch in Curaçao and Dutch Guiana. Before the middle of the eighteenth century coffee plants were being grown in almost all West Indian islands and in all the Central and South American countries, which have since become the chief producers. Africa, the original home of the coffee tree, was the last to undertake its large-scale cultivation.

The destruction of millions of sacks of surplus crop in Brazil is spectacular evidence of the enormous increase which has taken place in the production of this one commodity since the ships of the merchants of St. Malo appeared in Yemen to bargain for a share of the product of the Arabian coffee gardens. Who could have predicted at the time of the visit of the French coffee buyers that the economy of entire nations in another hemisphere some day would be largely dependent on commerce in the dried seeds of this Abyssinian plant!

EXOTIC BIRDS IN NEW EXHIBIT

By EMMET R. BLAKE
ASSISTANT CURATOR OF BIRDS

Two temporary screens of mounted birds recently installed near the southwest end of Hall 21 illustrate in a striking manner the great diversity of color, pattern, and form to be found in the bird world. Sixty-two species, representing more than thirty families, are included. All of the birds are of foreign origin, with the Australian region particularly well represented.

Among the more striking exotic species is a crowned pigeon of New Guinea. This handsome bird, the largest member of its family, attains the size of a small turkey and superficially bears little resemblance to any other pigeon. An erect fan-shaped crest, dull bluish, like the general plumage, arises from the top of its head and lends it a particularly distinguished appearance. Smaller, but scarcely less attractive, is the Nicobar pigeon of Australasia with its remarkably developed mantle of greenish-bronze feathers.

Of special interest is the kea, a large olive green parrot of New Zealand. Keas inhabit the higher mountains during the warm months but descend to the sheep ranges in winter. Although normally omnivorous, these sturdy birds have become a serious economic problem in some areas through their attacks upon sick or weakened sheep which they destroy by devouring the fat about the kidneys.

Weaver finches, an Old World family of extremely diverse sparrow-like birds, are represented by nine of the more colorful species. Several hundred forms are known to science. Many have become popular as cage birds because of their attractive colors and hardiness in captivity. Our ubiquitous but relatively drab English "sparrow" is, in reality, a weaver finch, which has spread over most of this country since its introduction at Brooklyn, New York in 1850.

CROWNED PIGEON

The largest member of its family, this beautiful bird of New Guinea may grow to the size of a small turkey.

The bird fauna of the American tropics is represented by numerous rare or beautiful species. The oil bird of Trinidad and northern South America constitutes an anatomical link between owls and goatsuckers and bears a notable superficial resemblance to the latter. Oil birds dwell in caves from which they emerge at night to feed upon palm seeds. Their name is derived from the condition of the nestlings, which become so distended with fat as to attract native hunters who melt out the oil for use as butter.

A quetzal, the national bird of Guatemala (also represented in a habitat group in Hall 20), a crested oropendola, a motmot, an Australian tawny frogmouth, a Philippine hornbill, and various tanagers and other exotic species which pique the imagination or delight the eye are also displayed. The birds were prepared for exhibition by Staff Taxidermist John W. Moyer.

Folk-lore of Christmas Plants

You have to have holly at Christmas, of course, and you know what to do when you encounter the mistletoe. But do you know why you do these things? The origin of the customs surrounding these Yuletide shrubs is traced in *Mistletoe and Holly*, a leaflet published by Field Museum. This little book, which makes a charming Christmas gift itself, presents in interesting form the principal botanical facts about the plants.

On sale at THE BOOK SHOP of FIELD MUSEUM. Price 25 cents. Copies may be ordered by mail.

U. S. RANKS NEXT TO MANCHURIA IN SOYBEAN PRODUCTION

By LLEWELYN WILLIAMS
CURATOR OF ECONOMIC BOTANY

The soybean (*Glycine max*), an erect, annual plant is native to southeastern Asia. Also known as "soja" or "soyabean," it belongs to the bean or pulse family. It has been cultivated since ancient times in China, Korea, and Manchuria, where it still forms a substantial part of the natives' diet, as well as the source of an edible oil. Despite its antiquity and high nutritive value for man and beast, it seems to have spread slowly into countries outside of the Far East. It was brought to Europe towards the end of the eighteenth century and planted in botanical gardens, but it did not at that time attract much attention as a plant of economic importance.

In recent years the soybean has been the subject of considerable experimentation in the United States, particularly in the middle west and the eastern states. Due to the ease with which it can be grown as a fodder plant, its large yield and, more recently, the application of the oil and meal from the seed for varied industrial uses as well as for food, this legume now forms an agricultural crop of importance in this country. The United States ranks second only to Manchuria in world production. The bulk of the soybean crop produced here is used for fodder; the rest for the extraction of oil and meal for use as ingredients in the preparation of feed and foodstuffs, and for industrial purposes.

800 VARIETIES; MANY USES

The number of varieties and types of soybeans is said to exceed eight hundred, distinguished largely according to the color, size, and shape of the seed, and the time required to attain maturity. The early varieties are preferred for seed crops, and the medium or late varieties for hay, forage and ensilage. For the production of oil the yellow varieties are considered the best, but when meal is desired the green or black beans are used.

The oil extracted from the soybean belongs to the semi-drying class, that is, having properties intermediate between drying oils such as linseed, and non-drying oils exemplified by olive oil. Three methods are employed to remove the oil from the seed. The most primitive system is that in use in the native mills of Manchuria, and involves the crushing of the beans into flakes beneath a granite millstone. The wafers are then placed in gunny bags and steamed, and pressure is applied to the resultant mass to express the oil, the meal remaining as a round, flat cake. In modern American mills the oil is extracted by passing the crushed beans, in the form of flakes, through a solvent (benzine or gasoline), or by the expeller method, involving the application of hydraulic pressure preceded by steam.

In the crude state the oil is used in the manufacture of soap and insecticides. When refined, by washing the crude oil with a weak alkali solution to separate certain undesired constituents, it is employed for a wide variety of purposes, such as in margarine and as a cooking oil; also in paints, varnishes, enamels, waterproofing compounds, and lithographic inks. One important soybean product, separated from the extracted oil by centrifugal action, is lecithin, a complex fatty, viscid, brown substance. It finds application as an addition to cocoa butter in the chocolate coating of candy, and is used also in the preparation of emulsions, and, more recently, for painting gasoline tanks of airplanes to prevent oxidation. The soybean is unusually rich in protein, which serves, like casein, in the manufacture of washable wallpaper, cold water paints, leather finishes, paper sizings, paper and wallboard coatings, textile finishes, and plastics.

The soybean differs from the usual cultivated legumes, such as lentils, peas, and beans, by its low starch content. Its unusually high percentage of protein and oil

A PLANT MUCH IN THE NEWS

City dwellers have heard and read a great deal about manufactured products of soybean origin, often without having seen the plant. Hence, this exhibit in Hall 28.

explains its nutritive value. What is true of beans in general is true also of soybean. In order that the nutrients contained in it may be digestible, the soybean must be cooked or treated in some way that breaks down the cell walls—then its contents are readily acted upon by the digestive juices.

SOURCE OF CHOP SUEY SAUCE

The soybean is used more extensively as food in China and Japan than in other countries. There it is usually prepared in conjunction with other materials. One of these Oriental foods is "natto," prepared by boiling the seeds in water for several hours to render them soft. The hot mass is then wrapped in small portions in straw and the bundles are placed in a cellar in which fire has been kindled. There the cooked beans are allowed to ferment in a warm, moist atmosphere. The resulting, thick mass has a peculiar, not unpleasant odor. Bean cheese, or "tofu," is obtained by soaking the beans in water for about twelve hours, and crushing them between millstones. The ground material is then boiled with water for about an hour and filtered. The liquid is white, opaque, and has the general appearance of cow's milk. Another food product prepared in the Orient is "shoyu," a sauce prepared from a mixture of cooked, ground soybeans, roasted wheat flour, salt and water. The mass is allowed to ferment in rice wine in casks for one to several years. The resulting product is a thick, brown liquid, commonly known to us as soy sauce, and widely used in this country with chop suey.

For use as human food in the United States the soybeans are heated to remove the bitter taste characteristic of the untreated seed. Finely ground soybean meal is employed in admixture with wheat-flour for bread. The white, fat-containing flour is employed in the baking and packing industries, while the meal is made into pellets of convenient size for feeding cattle and sheep on the open range.

An exhibit of soybean was recently installed in Case 30, in the northeast corner of Hall 25 (Hall of Food Plants).

FOURTH GUATEMALA EXPEDITION DISPATCHED BY MUSEUM

Field Museum's fourth botanical expedition to Guatemala will depart from New Orleans on December 3. It will be conducted by Dr. Julian A. Steyermark, Assistant Curator of the Herbarium, who led a similar expedition to that country in 1939–40. Dr. Steyermark will be accompanied by Mr. Albert Vatter, of Glenview, Illinois. Mr. Vatter has had considerable experience in wild flower photography, and one of the results of the expedition should be the acquisition of a large series of photographs of the Guatemalan flora to serve as records and to supplement the dried specimens collected for study purposes.

This expedition is expected to conclude the field work in Guatemala carried on since 1928 in preparation for a flora of that country by Curator Paul C. Standley and Assistant Curator Steyermark. Dr. Steyermark plans to remain in Guatemala about ten months, and devote his time to the exploration of those areas which have not been investigated by previous expeditions, as well as areas whose wealth of flora demand greater attention. Since none of the previous expeditions had been in Guatemala throughout the rainy season, one of the principal objectives of the present expedition will be to make collections during that season from the many areas which then attain their maximum of floral development.

EXHIBIT SHOWS PIG-LIKE ANIMALS OF THE BAD LANDS 30 MILLION YEARS AGO

By ELMER S. RIGGS
CURATOR OF PALEONTOLOGY

A new exhibit in Ernest R. Graham Hall (Hall 38) includes members of four families of animals, three of which are pig-like in their structure and apparent habits, while a fourth is similar in general proportions but quite unlike the others in structure. This arrangement of animals which are not closely related is necessary in dealing with groups in which only a few specimens of the several families are available for exhibition.

The families included in this exhibit are: the native American pigs or peccaries; a larger pig-like family known as the Achaenodonts or short-faced pigs; and a still larger and more imposing line of animals known as the Enteledonts. Along with these closely related families of animals are exhibited members of a distinctly North American family of hoofed animals known as the Oreodonts. These animals were similar to the pig-like families in general proportions, but differ from them in the structure of teeth and probably in general feeding habits.

The peccaries are a distinctly American family of animals. They are known from this continent throughout a period of thirty million years. The earliest specimen exhibited in this case is of a small animal called *Perchoerus* which lived in the Great Plains region and whose fossil remains are preserved, but rarely, in the Bad Land formations which center about the Black Hills of South Dakota.

A somewhat larger animal in this line is found in the Miocene sandstones of western Nebraska. Its kind are known under the name of *Desmathyus* and may well be lineal descendants of the little animal from the Bad Lands mentioned above. In fact, the various layers of Bad Land clays which appear in the basin south of the Black Hills are covered first by ledges of hard sandstones which appear in the face of Pine Ridge and then by layers of softer sandstone, all of which laid one upon the other form a continuous geological series recording the history and preserving the bones of many animals which lived thereabouts. From these series of rock strata have been collected the specimens of the two earlier genera of peccaries.

LARGEST OF THE PECCARIES

The third and largest member of this family exhibited is a peccary which attained a size equal to that of the wild boar of western Europe. The specimen is one of a number of individuals which were found in a cave deposit of Pleistocene age in western Maryland. Specimens in another group, classed with the above-mentioned animal but distinguished as a different species, were found near Goodland, Kansas, in a bed of clay which was being dug out for the purpose of making brick.

An individual of a species of peccaries still living in South America is shown as a modern representative of this line and completes the column of specimens representing this family. This specimen of an extant animal is somewhat smaller than the next older extinct animal. Two living species of peccaries range through the southwestern states, Mexico, and parts of South America. The South American species may be regarded as immigrant descendants of the older North American stock which reached that continent after land connections with the northern continent were established.

The Entelodonts are known in North America from the earlier part of the Oligocene epoch. They are preserved in the Bad Land formations along with the remains of earlier peccaries, and were much larger and stronger. They were a vigorous stock represented by at least two distinct types, a larger and a smaller. They continued through the Oligocene and well into the lower Miocene epochs where they reach a size equal to that of the modern bison (a fine specimen of the larger type had to be left out of this exhibit because of its size). In the early part of the Miocene epoch they disappeared from the fossil-bearing formations of North America. Whence they came to the Great Plains area is still unknown. Related animals lived in Europe about the same time and survived there to a somewhat later period.

The Achaenodonts are a kind of short-faced pig which are known from a few skulls found in the middle Eocene Bad Lands of Utah and from a few specimens found in an older formation. They are of a sturdy stock as the short but massive skull indicates. Whether or not their ancestral stock originated in North America is not known. They disappeared entirely with the close of the Eocene epoch leaving no known traces in later formations.

The Oreodonts are only distantly related to the pig-like mammals. They may be characterized as the most distinctively North American family of mammals. Specimens of eight different genera are included in this exhibit; more than three times that number are known from formations on this continent. Their entire history covers a period of some thirty million years.

OREODONTS 100% NORTH AMERICAN

The earliest oreodonts are considered by some eminent paleontologists as closely related to the camel ancestors of their time. Their teeth are similar in structure and arrangement to those of the cow and sheep, although the upper incisors were present and of use in all the thirty-odd genera of the animals that have been found and recorded from the Great Plains region.

While many families of animals have developed on one continent and later migrated to another—as examples we have the horses, deer, and elephants—the oreo-

RESTORATION OF THE GREAT ENTELODONT (DINOHYUS)

The animals in the central foreground of this mural painting by Charles R. Knight (in the series on the walls of Ernest R. Graham Hall) represent one of the kinds of pig-like mammals from the early Miocene deposits of Nebraska, as fossil specimens indicate it must have appeared when living. The animal was as large as a bison, with a head a yard in length.

donts are nowhere known outside the continent of North America. They were distinctly a "stay-at-home" family. At the same time they became so numerous and so abundant on this continent that in certain rock formations, such as the Bad Lands of the Dakotas and neighboring states, the fossil skulls and skeletons of these animals are common objects. Sometimes their skeletons are found in groups of four or five lying close together and apparently overcome and covered up by a sandstorm or other natural calamity. Again, single specimens may be found in a locality. Only one mounted skeleton could be shown in this exhibit although a number of other entire skeletons are preserved in the study collections of the Museum.

The specimens belonging to this family are exhibited in four vertical columns, each column being made up of the individuals of a single geological epoch. A restoration in color, a copy of the work of a well-known animal artist, shows a species of these animals in its native surroundings. Such illustrations not only give a vivid picture of the animals as they appeared in life, but add a touch of color to the group and enliven the whole exhibit.

THINGS YOU MAY HAVE MISSED

Brides on the Installment Plan

Brides are purchased on the installment plan in the Kei group of islands in the Netherlands East Indies. A memorandum representing a contract for the purchase of a bride, carved on a wooden paddle, is exhibited in the Hall of Malaysia (Hall G, Case 53) at Field Museum. From the number of payments specified it is apparent that credit in Kei is more liberal than the present eighteen-months limit on installment sales of certain products in the United States. Furthermore, the gold standard has apparently not been abandoned there, as it is specified that many of the payments shall be made in the precious metal. There is no indication as to what happens when a bridegroom fails to make payments on time —whether or not the father of the girl can then repossess her as the furniture, radio and automobile installment men repossess their chattels here.

The price of a bride among the upper class of Kei natives may amount to five hundred dollars or more. Her father keeps an account of the periodical payments by cutting a record on the face of a board, such as that displayed at the Museum, of the number and kind of objects received in payment. When payments are completed, the board is given to the bridegroom as a receipt.

The Museum's account board has twelve carved lines, each representing a series of payments. First there are nine incomplete rings representing gold bracelets, then fourteen "rix-dollars" (silver coins introduced into the islands by the Dutch, with a normal value approximately equivalent to $1.20 in United States money). Other lines are carved notations of the payment of several kinds of gold ornaments, gongs, and more dollars. One line of payments includes a pig, followed by more gold objects and more money. The records of similar payments continue on the reverse side of the board.

BRIDAL CONTRACT

The Kei Islands are a small group lying south of western New Guinea. The original inhabitants were apparently quite similar to the Papuans. In the seventeenth century a large portion of the inhabitants of the Banda Islands nearby were forced to move to the Kei group. Later, natives from other Malayan islands also settled in the islands. The population now is partly pagan, partly Moslem, and partly Christian.

SPRING FLOWERS IN BLOOM AT THANKSGIVING

By JULIAN A. STEYERMARK
ASSISTANT CURATOR OF THE HERBARIUM

Ordinarily we sit down to dinner at Thanksgiving with cold winter blasts reminding us of the winter season to come. Outside of chrysanthemums and late garden stragglers we are not blessed with a multitude of flowers to beautify the landscape.

This November, however, and well through Thanksgiving week, so many plants that ordinarily are only spring flowers came into bloom that it seems worth-while to record them. Most Chicagoans will agree that October and November weather this year left much to be desired. Most of the days were either rainy, cold, or snowy, and at first thought would not seem conducive to plant life. Nevertheless, the abundance of rain plus the moderately cool weather somewhat simulated conditions which exist generally in the first days of spring, minus however, the sunshine of springtime.

Despite the lack of sunshine in October and November, pear trees were found flowering in October. Lilacs and a few other spring-flowering shrubs were recorded in bloom. Pitcher plants flowered again in October and November, and also rue anemone, wild blue violets, bird-foot violet, and several other species. Finally, the round-lobed hepatica (*Hepatica americana*), which ordinarily is one of the first of the spring wild flowers in the Chicago region, blossomed again in October, and in the woods around Barrington, at least, sent up two lavender flowers during Thanksgiving.

Mayas, Aztecs, and Toltecs

Because of their great intellectual achievements, their artistic skill, and their city-state organization, the Mayas have been called "the Greeks of the New World." The Aztecs, with their powers of political and military organization, their vast empire, and their borrowed arts and sciences, have similarly been compared to the ancient Romans. Collections representing these two cultures, as well as that of the Toltecs who preceded the Aztecs in the Valley of Mexico, are on exhibition in Hall 8 of the Department of Anthropology.

Ancient Corroded Metal Studied

A party of metallurgists from the Sun Oil Company recently visited the Museum to study the effects of centuries of corrosion on buried metals collected in Kish and Egypt. They were much interested in the Fink electrolytic treatment for restoring corroded metal. This method has been employed in Field Museum laboratories to restore hundreds of valuable specimens.

FIELD MUSEUM HONOR ROLL

Now in the Service of their Country:

Theodore Roosevelt, Trustee—Colonel, U.S. Army, commanding 26th Infantry, Fort Devens, Mass.

Joseph Nash Field, Trustee—Ensign, U.S. Navy, Headquarters, 9th Naval District, Great Lakes, Ill.

Clifford C. Gregg, Director—Major, U.S. Army, Assistant Adjutant General, 6th Corps Area, Chicago.

Melvin A. Traylor, Jr., Associate, Birds—Private, U.S. Marine Corps, Training Base, San Diego, Calif.

Patrick T. McEnery, Guard—Master-at-arms, U.S. Navy, Training School, Navy Pier, Chicago.

John Syckowski, Guard—Chief Commissary Steward, U.S. Navy, Training School, Navy Pier, Chicago.

George Jahrand, Guard—Chief Water Tender, U.S. Navy, Naval Armory, Chicago.

M. C. Darnall, Jr., Student Guard—Candidates' Class, U.S. Marine Corps Reserve (Officers' Training Course), Quantico, Va.

James C. McIntyre, Student Guard—Private, U.S. Army, Battery D, 31st Coast Artillery Training Battalion, Camp Wallace, Hitchcock, Texas.

Field Museum of Natural History

FOUNDED BY MARSHALL FIELD, 1893
Roosevelt Road and Field Drive, Chicago
TELEPHONE: WABASH 9410

FIELD MUSEUM NEWS

EDITOR

CLIFFORD C. GREGG .....*Director of the Museum*

ASSOCIATE EDITOR

WILFRED H. OSGOOD.....*Curator Emeritus, Zoology*

CONTRIBUTING EDITORS

PAUL S. MARTIN.....*Chief Curator of Anthropology*
B. E. DAHLGREN.....*Chief Curator of Botany*
HENRY W. NICHOLS.....*Chief Curator of Geology*
KARL P. SCHMIDT .....*Chief Curator of Zoology*

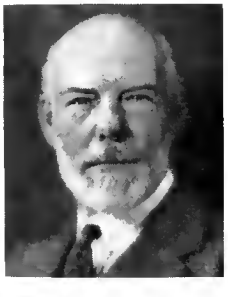
MANAGING EDITOR

H. B. HARTE.....*Public Relations Counsel*

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

TRUSTEE A. W. HARRIS RESIGNS; H. W. FENTON ELECTED

Mr. Albert W. Harris, a member of the Board of Trustees of Field Museum since December 20, 1920, and Third Vice-President since January 16, 1933, recently presented his resignation, which has been regretfully accepted by the Board of Trustees. Mr. Harris's resignation was tendered for personal reasons, and became effective immediately.



ALBERT W. HARRIS

In the twenty-two years during which Mr. Harris has been associated with the administration of the Museum, he has taken an active part in the deliberations of the Board and has contributed exceedingly valuable counsel in connection with the policies and practices of the Museum. Mr. Harris is a Benefactor, an Honorary Member, and a Life Member of the Museum. He has for many years been a most enthusiastic supporter of the work of the N. W. Harris Public School Extension which was founded in 1911 by his father, the late Norman Wait Harris. The foundation was established by Norman Wait Harris with an endowment of $250,000, and this has been more than doubled by the contributions of Mr. Albert W. Harris, whose gifts over the years have reached a total exceeding $250,000.

At a meeting of the Board held on November 17, Mr. Howard W. Fenton, President of the Harris Trust and Savings Bank, was elected a Trustee of the Museum to fill the vacancy occasioned by Mr. Harris's resignation. Mr. Fenton, has been prominent in Chicago business and civic activities for many years. He joined the staff of the Harris Bank in 1895, became its Treasurer in 1907, a Director in 1909, Vice-President in 1911, and President in 1923.

Honorary Appointment to Maya Expert

Mr. J. Eric Thompson, of the staff of the Division of Historical Research at the Carnegie Institution of Washington, D.C., has been given an honorary appointment on the staff of Field Museum, as Research Associate in Middle American Archaeology. Mr. Thompson is well-known as an expert on the archaeology and ethnology of the Mayas, and has written a number of books on these subjects, some of them published by Field Museum Press. Prior to joining the Carnegie Institution staff, Mr. Thompson was for a number of years on Field Museum's staff as Assistant Curator of Central and South American Archaeology, and conducted for this institution a series of expeditions to British Honduras under the sponsorship of Mr. Marshall Field. On these expeditions he made researches in the Maya field which were the basis of some of his most important publications.

NEW MEMBERS

The following persons became Members of Field Museum during the period from October 16 to November 15:

Associate Members

William B. Basile, Joseph F. Garen, Edwin I. Guthman, William C. Hill, George M. Illich, Jr., Herman L. Kretschmer, Jr., Mrs. Albert F. Madlener, Jr., Mrs. Ferne T. Mollan, Richard H. Peel, Miss Elizabeth W. Pfaelzer, E. W. Puttkammer, Mrs. Jean Hippach Scharin, Robert Roy Schurig, Miss Maud E. Scott, Mrs. John Stephan, Mrs. Louis Vierling, Siegfried Weiss.

Annual Members

W. P. Bair, Sheldon M. Booth, Richard Bronwell, Robert M. Cobb, Hubert S. Conover, William C. Danne, Frank D. Darling, Samuel Edward Dean, Mrs. Albert J. Deniston, Jr., G. A. Freeman, G. E. Handtmann, Sister Mary Henry, Frank O. Hilburn, Theodore Holm II, Walter C. James, Miss Mary A. Kennedy, Mrs. Nathan Klee, Mrs. Alden J. Klein, Mrs. Nellie Kreber, Rev. A. R. Kretzmann, Mrs. William L. Leeds, W. R. Maxwell, George S. Nussear, Mrs. George H. Parkinson, Mrs. C. H. Phelps, Malcolm E. Shroyer, David Snyder, Dr. Fred Stenn, Raleigh R. Steuber, Arthur E. Stolle.

Some of the earliest chariot wheels ever found by archaeologists are exhibited in the Hall of Babylonia (Hall K).

Death Takes Carl F. Gronemann, Former Museum Illustrator

Mr. Carl F. Gronemann, Illustrator on the staff of Field Museum for many years, died November 4 at his home in Elgin, Illinois. Mr. Gronemann was first employed at the Museum in 1917. After a few years during which he was engaged in illustrating an important encyclopedia, and other art activities, he rejoined the Museum staff in 1922 and remained until the summer of 1941, when because of advancing years and ill health he was retired on pension. Mr. Gronemann was a capable artist, and made illustrations for many of the Museum's publications, as well as preparing maps, paintings, and drawings for use as posters, as elements of various exhibits, and for other purposes. He was deeply interested in the conservation of wild life, and was the founder and past president of the Elgin Audubon Society, and the Elgin Nature Study Society. He was also for a time chief commissioner of Elgin's botanical park, and active in the work of many horticultural associations and garden clubs.

At the time of Mr. Gronemann's retirement his assistant, Mr. John J. Janecek, was appointed as Illustrator to succeed him.

Eastern Educator Visits Museum

Field Museum was host to Mrs. Jane Garrison, Director of the Children's Museum, Brooklyn, New York, on her recent visit to Chicago to acquaint herself with the developments and progress of work with children as carried on here and at other institutions in this city.

A FEW FACTS ABOUT FIELD MUSEUM

Field Museum is open every day of the year (except Christmas and New Year's Day) during the hours indicated below:

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

Admission is free to Members on all days. Other adults are admitted free on Thursdays, Saturdays, and Sundays; non-members pay admission on other days: Established price 25 cents, Federal tax 3 cents, total 28 cents. 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 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 at 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.

Free courses of lectures for adults are presented in the James Simpson Theatre on Saturday afternoons (at 2:30 o'clock) in March, April, October, and November.

A Cafeteria serves visitors. Rooms are available also for those bringing their lunches.

Chicago Motor Coach Company No. 26 busses provide direct transportation to the Museum. Service is offered also by Surface Lines, Rapid Transit Lines (the "L"), interurban electric lines, and Illinois Central trains. There is ample free parking space for automobiles at the Museum.

CURATOR ROY RECOUNTS HIS EXPERIENCES IN THE ARCTIC

Latest addition to Field Museum's Geology Memoirs is *The Upper Ordovician Fauna of Frobisher Bay, Baffin Land*, by Dr. Sharat Kumar Roy, Curator of Geology.

Unlike most technical publications this quarto-size volume of 212 pages is partly devoted to a lively account of the day-by-day doings of the members of the Frederick H. Rawson Expedition to Labrador and Baffin Land. Although the expedition conducted its work during the fifteen months beginning in June, 1927, this book is the first detailed narrative to be published. Other duties prevented Dr. Roy from preparing his manuscript earlier.

MOSQUITOES WORST PEST OF FAR NORTH

The average stay-at-home reader's concepts of the hardships of Arctic exploration are apt to receive a startling jolt from the following paragraph in Dr. Roy's book:

"At dawn on July 8, Battle Harbor, Labrador, was sighted. We steamed past it and anchored in Assizes Bay. Now, for the first time, we encountered the dreaded mosquitoes and black flies! It is well to emphasize here that they are far more formidable a menace than is usually believed. Although we were equipped with the best-known protections against these horrible pests, none proved equal to the situation. Of the two evils of the North—mosquitoes and flies in summer and bitter cold in winter—the latter is by far the more bearable."

It may be noted, in passing, that Dr. Roy is a native of India, accustomed to a semi-tropical climate. So far as is known, he is the only East Indian ever to have gone into the Arctic regions.

DOUBT CAST ON "VIKING RUINS"

On Sculpin (or Kanaiotok) island, supposed Viking ruins were investigated. "It is commonly believed that this island was settled by Norsemen some 900 years ago and that the ruins found there might be Norse," writes Dr. Roy. "A survey of the ruins and examinations of the artifacts, however, led our anthropologist, Dr. William Duncan Strong, to conclude that the site represents an early Eskimo spring or autumn camp of the Thule culture."

TRAGIC LIFE OF NASKAPI INDIANS

On arrival in Anatalak Bay the expedition made first contact with the Naskapi Indians. "Rarely, in North America today, can one get the thrill that comes with the first sight of a Naskapi, for the Naskapi are truly wild Indians, living by the hunt as their ancestors did before them. From Northwest River to Ungava Bay . . . is an unexplored area of 300,000 square miles entirely unoccupied save by one hundred Indians . . . . The lot of a Naskapi is not a happy one . . . . On snowshoes, the hunter wanders day after day on the lookout for such caribou as the Caribou God may send in answer to his prayers . . . . When the caribou are not to be found, the Indians starve; often the men drop in their tracks."

The expedition retraced the course of Sir Martin Frobisher, first explorer of the American Arctic, who made three voyages between 1576 and 1578 under the patronage of Queen Elizabeth. Frobisher took back to England hundreds of tons of rock which he and his companions supposed to be gold ore, but which turned out to be worthless. At Kodlunarn Island, where Frobisher planned a colony, the Museum party found house ruins, mining trenches, water reservoirs, and fragments of supplies.

STRANGE NATURAL PHENOMENA

Among the natural phenomena which Dr. Roy observed are the movement by ice expansion of great boulders weighing many tons, and lakes domed with ice to twenty feet or more above their summer water levels.

"A constant topic of conversation during the winter in Labrador is that of the 'drift.' The term 'drift,' as used by the natives, is not what we generally call snowdrift but is a living, moving mass of powdery snow dust that has been picked up and carried along by the wind. Very often it reaches a height of ten feet or more. No one dares to go out into it, for to do so is almost certain suicide. Objects within arm's length cannot be seen. In it one loses all sense of direction; pathways that may be followed on the darkest night become strange and unfamiliar. When accompanied by a strong wind it cuts like a sand blast and facing it is all but impossible. The dust is so powdery that it enters the very smallest opening and packs solidly inside the clothes . . . .

WATER THAT DOESN'T FREEZE AT 30° BELOW

"Of all phenomena relating to ice and snow, the most interesting was the presence of fresh flowing water on the beaches and near-by areas at air temperature many degrees below freezing. This water is known locally as 'quor' water. What the term means is not known unless it be the degenerated form of the word 'queer,' but to find flowing water when even the swiftest brooks have frozen to a depth of a foot or more is perplexing . . . . Apparently, it is some form of seepage from considerable depth below the level of the frozen ground, where circulation of water is possible. Yet it is difficult to explain why the water should collect in streams and flow out on the accumulated ice without freezing . . . .

"Although 'quor' water is a great blessing as a source of abundant drinking water, it is also a real menace. Because of the constant seepage, the snow is kept so mushy that it is extremely difficult, and often impossible, to walk along the beaches, where the 'quor' water seems to be more prevalent than elsewhere. Wet feet, when the temperature is around 30 degrees below zero, are likely to freeze without warning."

In the technical portion of the book, Dr. Roy gives scientific descriptions of hundreds of fossils he collected. Included among a number of new species are four which he named *Receptaculites fieldi*, *Westenoceras greggi*, *Krausella rawsoni* and *Calymene macmillani* in honor respectively of Mr. Stanley Field, President of the Museum, Major Clifford C. Gregg, Director of the Museum, the late Frederick H. Rawson, Chicago banker who sponsored the expedition, and Commander Donald B. MacMillan who led the expedition.

In addition to Dr. Roy and Dr. Strong (the latter now a professor of anthropology at Columbia University), other members of the expedition were Mr. Alfred C. Weed, Curator of Fishes; Mr. Arthur G. Rueckert, Taxidermist; Mr. Joseph N. Field (son of President Stanley Field), then a young boy, now an ensign in the United States Navy and a Trustee of the Museum; and Mr. Kennett Rawson, son of the sponsor, who later served as navigator with Admiral Byrd in the Antarctic.

WEEK DAY LECTURE TOURS OFFERED IN DECEMBER

Conducted tours of exhibits, under the guidance of staff lecturers, are made every afternoon at 2 o'clock except Saturdays, Sundays, and certain holidays. Following is the schedule for December:

Week beginning December 1: Monday—Animals of the Six Continents (Miss Elizabeth Best); Tuesday—General Tour; Wednesday—Egypt and the Mummies (Clarence L. Brown); Thursday—General Tour; Friday—Weavers and Potters of the Southwest (Miss Elizabeth Hambleton).

Week beginning December 8: Monday—Fur-bearing Animals (Miss Elizabeth Best); Tuesday—General Tour; Wednesday—The Beauties and Beasts of the Deep (Clarence L. Brown); Thursday—General Tour; Friday—Traveling by Land and by Sea (Miss Elizabeth Hambleton).

Week beginning December 15: Monday—Fruits (Miss Marie B. Pabst); Tuesday—General Tour; Wednesday—Earth Features and Their Meanings (Bert E. Grove); Thursday—General Tour; Friday—The Races of Mankind (Mrs. Leota G. Thomas).

Week beginning December 22: Monday—The Wild Relatives of Some of the Domesticated Animals (Miss Elizabeth Best); Tuesday—General Tour; Wednesday—Adventures of a Fossil Hunter (Bert E. Grove); Thursday—*no tour*, Christmas holiday; Friday—Designs in Wood (Miss Marie B. Pabst).

Week beginning December 29: Monday—Animal Life of Polar Regions (Mrs. Leota G. Thomas); Tuesday—General Tour; Wednesday—Geology in National Defense (Bert E. Grove).

Persons wishing to participate should apply at North Entrance. Tours are free. By pre-arrangement with the Director, special tours are available to parties.

Christmas Shoppers, Believe It or Not— There IS a Santa Claus!

The above may seem like a shocking statement for a scientific institution to make.

But Field Museum is prepared to prove it by *being* a Santa Claus to help you in the solution of some of your Christmas problems. We not only have the reindeer (see the habitat group in Hall 16) but we have other facilities to make your Christmas shopping painless.

Would you like to avoid the rush and confusion of the crowds on State Street? Field Museum makes it possible for you to do your shopping while sitting cozily at your desk in your own home or office.

When you wrap packages, do you tear the fancy gift paper, get the string tangled and your own nerves into a snarl, and end up with a cumbersome parcel that makes the man at the post office frown? Field Museum stands ready to relieve you of all such grief.

Do you hate standing in line to have packages weighed, stamped, and insured? Field Museum makes it unnecessary for you to go near a post office.

The Museum offers its services in two forms which, we believe, reduce the difficulties of Christmas shopping to the *n*th degree. All you need is a pen—we even furnish the postage.

Here are the plans:

1. Christmas Gift Memberships in the Museum. With this issue of FIELD MUSEUM NEWS there are enclosed Christmas Membership application forms, and postage-prepaid envelopes for returning them. All you need to do is designate the name of the person you wish elected to membership, and send the form in with your check. The Museum will handle all details, sending the recipients attractive Christmas cards notifying them that they have been elected Members of this institution through your courtesy. With the card will be sent information about their privileges as Members, as well as the regular Membership cards (and Certificates in the case of Life and Associate Members).

2. Services of the Book Shop of Field Museum. The Book Shop is prepared to furnish books, endorsed for scientific authenticity by members of the Museum staff, for both adults and children. Also, the Book Shop has in stock a wide selection of other appropriate gifts, such as book ends, illuminated globe-maps of the world, and animal models suitable for use as library decorations or as toys for children. You are invited to browse in the Book Shop during part of your next visit to the Museum. Where desired, the Book Shop will handle mail and telephone orders, and will undertake all details in connection with wrapping, and the dispatching of gift purchases to the designated recipients, together with such forms of greeting as the purchaser may specify. Purchasers may also indicate the date upon which delivery is to be made.

GIFTS TO THE MUSEUM

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

Department of Botany:

From Paul H. Allen, Balboa, Canal Zone —58 herbarium specimens, Panama; from Dr. César Vargas G., Cuzco, Peru—64 herbarium specimens, Peru; from Donald Richards, Chicago—47 herbarium specimens; from Dr. Francis Drouet, Chicago—398 specimens of cryptogams, eastern United States; from Arkansas Agricultural and Mechanical College, Monticello, Ark.—370 herbarium specimens, Arkansas.

Department of Geology:

From Edward L. Holt, Grand Junction, Colo.—2 mineral specimens, and 110 fossil shells and plants, Colorado and Utah; from Henry E. Lee, Rapid City, S. D.—a specimen of algal agate, South Dakota; from Dr. Paul C. Boomer, Chicago—24 gems; from United States Gypsum Company, Chicago —8 samples of sheet rock.

Department of Zoology:

From Robert Kellogg, Milton Township, Ill.—30 reptiles and amphibians, Canada; from Boardman Conover, Chicago—19 bird specimens, Celebes and Mexico; from John M. Schmidt, Homewood, Ill.—2 garter snakes, Colorado; from Charles M. Barber, Hot Springs, Ark.—a king snake and a beetle, Arkansas; from Rev. Adolph M. Krahl, Yuma, Ariz.—2 rattlesnakes, Arizona and California; from Illinois Department of Conservation, Springfield, Ill.—3 rattlesnakes, Illinois; from Thomas Kramer, Harvey, Ill.—a fox squirrel, Illinois; from Chicago Zoological Society, Brookfield, Ill. —3 bird specimens; from Chicago Academy of Sciences, Chicago—a water snake, Texas; from Dr. W. G. Clark, Minneapolis, Minn. —2 toads, Cuba.

The Library:

Valuable books from Kenneth I. Van Cott, New York City; Dr. Henry Field, Washington, D.C.; and Karl P. Schmidt, Paul C. Standley, Dr. C. Martin Wilbur, and Rupert Wenzel, all of Chicago.

Harris Extension:

From Mrs. Charles B. Cory, Sr., Chicago —157 pressed and mounted plants, 68 butterflies, 62 moths, 11 dragonflies, and a katydid.

No forms of life are more fascinating than those of the sea. Have you visited Field Museum's new Hall of Fishes (Hall O)?

DECEMBER SUNDAY LECTURES —"NIGHT-RIDERS OF SKY"

"Mysterious 'Night-Riders' of the Sky" is the topic of the Sunday afternoon lectures to be presented during December by Mr. Paul G. Dallwig, the Layman Lecturer of Field Museum. In this lecture Mr. Dallwig will explain the differences between comets, meteors, and meteorites, and tell the history of some of the noteworthy "falls" of celestial iron and stone masses during the years since records of such phenomena have been made. A second feature of the lecture will be an imaginary trip to the moon, in which all observations are based upon scientific facts. In this part of the lecture Mr. Dallwig will employ the technique of dramatizing science which has accounted for the popularity of so many of his lectures. The moon adventure will be divided into three parts: Scene 1, The "Take-off"; Scene 2, A Trip Through the Stratosphere, and Scene 3, A Day on the Moon.

The same lecture will be presented on each of the four Sundays during December. Heavy public demands for Mr. Dallwig's lectures make it necessary to limit each audience to 100 adults (*children cannot be accommodated*). Those desiring to attend should make reservations as far as possible in advance. Reservations will be accepted by mail or telephone (WABash 9410).

The Sunday afternoon lectures begin promptly at 2 P.M., and end at 4:30.

In January Mr. Dallwig's subject will be "Nature's 'March of Time.' "

STAFF NOTES

Dr. Paul S. Martin, Chief Curator of Anthropology, and Dr. Alexander Spoehr, Assistant Curator of American Ethnology and Archaeology, were lecturers before a large class of students of Rosary College, Lake Forest, Illinois, who visited the Museum recently for special studies. After the lectures, the students were introduced to actual research methods, with the study collections of the Department of Anthropology as working material.

Mr. Loren P. Woods, Assistant Curator of Fishes, recently gave a lecture on Field Museum and its work before an assembly of students and faculty of Lake Forest College, Lake Forest, Illinois.

Dr. Julian A Steyermark, Assistant Curator of the Herbarium, gave an illustrated lecture on November 13 at Field Museum before the Illinois Wild Flower Preservation Society. His subject was "Wild Flowers of Guatemala."

Chief Curator of Zoology Karl P. Schmidt lectured at the Royal Canadian Institute, at Toronto, November 22, on the subject "A Naturalist in the South Seas."

PRINTED BY FIELD MUSEUM PRESS