

Field Museum News

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PACIFIC ISLES, FOCUS OF ALL EYES, EXTENSIVELY REPRESENTED IN MUSEUM

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CURATOR OF AFRICAN ETHNOLOGY

On Sunday, December 7, 1941, all America was electrified by the news flashes from our Pacific outposts. As the events of that and following days have inevitably occupied first place in the thoughts of our people, it seems timely to call attention to Field Museum's wealth of Pacific islands ethnological material. These collections, obtained over the years by many expeditions, rank among the most comprehensive in the world. Exhibited here, they provide the public with a more intimate knowledge of the places and peoples now so prominently figuring in our daily papers.

Few are they who have not thrilled to the great romances of the South Seas, a vaguely defined region extending over many thousands of miles from the Philippines to Easter Island. Some adventurous American youths have braved the solitudes in small craft under sail or power. Others have comfortably tucked themselves in the armchair and gone pearl fishing or trading for copra in the pages of Jack London, or have dipped into Robert Casey's descriptions of the mysterious stone images of Easter Island. Pictorial magazines have brought us into close touch with unexplored regions of the great island of New Guinea, and thousands have traveled vicariously the vast expanses of the south Pacific while attending lectures in the James Simpson Theatre at Field Museum. The Museum has four large halls (Halls A, F, G and H) filled with exceptionally extensive exhibits from Polynesia, Micronesia, Melanesia, the Malay Peninsula, Malay Archipelago, and the Philippines.

To the motion picture industry Oceania has provided an inexhaustible supply of romance, adventure, and tragic fate. Dead must be the soul of a boy who could not thrill to *Mutiny on the Bounty* and the adventures of Captain Bligh. Sent afloat by a mutinous crew, he traversed thousands of miles of ocean before landing at Timor in the East Indies. Another great epic is

many literary attractions relating to the Pacific Ocean that are available in the Library of Field Museum.

One may ask what a museum has to do with our modern concerns. Are we not today wholly engrossed with the value of the islands as fueling depots, and the opening up of the Pacific to exchange trade goods for copra, rubber, oil, and countless other

things which a hungry civilization demands? The answer to that question should be a definite negative.

There is no need to advise a glance at a map of the Pacific Ocean. Men have long been studying the details of the Pacific in the morning papers, and not for many years has there been such a thorough brushing-up of our school geography.

But while paying due regard to the importance of strategic and economic considerations, let us not forget the claims of several million Polynesians, Melanesians, and Indonesians, as well as the intrusive Malays, Chinese, and migrants from India.

The intermarrying of these elements in many places has produced a mixed ancestry of "Euronesians." One can easily imagine the complex problems of health, labor, and social contacts that confront the administrators of regions where American and British interests are involved. If not convinced of the pressing importance of these problems, let us consult in our Field Museum Library two more books, *The South Seas in the Modern World* and the *Statesman's Year Book for 1941*, and we shall have no further doubt what the present conflict means to millions who have become dependent on the ruling of what should be a kindly and sympathetic government. All administrators are agreed that the first requisite of successful rule is a deep understanding of the history and cultural background of those who inevitably are



PHILIPPINE NATIVES ON TERRACED RICE PLANTATION
A mural painting by Julius Moessel, in the Museum's Hall of Food Plants (Hall 25)

Masefield's *Victorious Troy* which brings home the vastness of these seas where today raiders prowl on, below, and above the surface. For those whose hearts are attuned to Hollywood's celluloid products, the romance of the Pacific is shown in idyllic form, with a background of waving palms, a lagoon, and a coral beach whose natural beauties are enhanced by the presence of Dorothy Lamour, who made an American household word of "sarong."

Strangely enough, the greatest epic of all, namely the first migrations of daring Polynesian voyagers, has not received its due recognition in popular pictures and light literature. But happily this has been remedied by the book, *Vikings of the Sunrise*, by Director P. H. Buck of the Bishop Museum, Honolulu. This is only one of

*Because the Museum has had no specialist in the Pacific field since the death of Dr. Albert B. Lewis in 1940, Dr. Hambly, whose own branch of research is African ethnology, has made this survey for readers of FIELD MUSEUM NEWS.

to be brought into line with the changes imposed by our modern civilization.

A walk through Field Museum halls containing a wealth of material from the Philippine Islands, the Dutch East Indies, Melanesia, and Polynesia (of which Hawaii is a part) will at once convince a visitor of the rich background, the artistic skill, and the infinite patience of the people who are sometimes condescendingly referred to as "primitives" or "the natives." The Museum has on display many groups of life-size figures of the peoples of these places shown engaged in occupations typical of their day-to-day existence, and miniature replicas of representative native villages.

SAMOAN—HALL 3*

peoples of these places shown engaged in occupations typical of their day-to-day existence, and miniature replicas of representative native villages.

RACIAL TYPES SHOWN

Besides the four halls of material collected from the Pacific, the Museum has, in Chauncey Keep Memorial Hall (the Races of Mankind—Hall 3), eighteen life-size sculptures—full figures, busts, and heads—of typical representatives of the peoples inhabiting Pacific islands. These bronze portraits, by the noted sculptor Malvina Hoffman, are included in the series of more than 100 such works representing the principal races of all the world.

AUSTRALIAN ABORIGINES

From Australia (Hall A-1) there are the ingenious though simple tools and weapons of a hunting people. The Australian aborigines live in tribes which are still in a Stone Age state of development, with no agriculture, no domestic animals except the dog, and no musical instruments. Most unique and well-known device of their simple culture is the boomerang.

POLYNESIA AND MICRONESIA

One large hall (Hall F) is devoted to Polynesia and Micronesia, and one (Hall A—Joseph N. Field Hall) to Melanesia. Polynesia includes such intriguing places as Fiji, Tonga, Hawaii, and the Society and Marquesas Islands. In this collection, the craft of the Maoris of New Zealand is well represented by a complete tribal council house, 60 feet long and 14 feet high, richly carved and painted, with timbers inlaid with mother of pearl decorations. It is

*Illustrations marked with asterisk show sculptures by Malvina Hoffman in Chauncey Keep Memorial Hall (Races of Mankind—Hall 3), and are copyrighted by Field Museum of Natural History.

the only such house in America, and one of only six now remaining in existence. From these members of the Polynesian stock, who are still extant and flourishing, there are gorgeous feather cloaks and jade ornaments. Polynesians of Mangaia in the Cook Islands have contributed exquisitely carved wooden axes, and from Samoa there are excellent examples of "tapa" or bark cloth. From Micronesia, which includes the Gilbert, Marshall, and Caroline Islands, the exhibits are more primitive, but nevertheless indicative of a skill and ingenuity well worthy of being preserved.

ANCESTOR WORSHIP IN MELANESIA

The Melanesian collections (Hall A) are unrivaled in America for their comprehensiveness. The hall devoted to them contains exhibits from New Guinea, New Britain, New Ireland, the Admiralty Islands, the

Solomons, New Caledonia, the New Hebrides, and many other islands and island groups. Tall carvings representing mysterious ancestral figures, and great wooden drums, typify the cultural symbols of these peoples.

The Philippine Islands are well represented in Hall H by models of the villages of

the Tinguan people of northwest Luzon. Tribesmen are shown at work in their forges making head-axes and spear-points, or planting rice on the terraced hillsides. The Igorot are represented by a miniature village and a life-size group showing the making of pottery. A group of six life-size figures represents Bagobo weavers engaged in preparing and weaving Manila hemp. Suits of armor, and cannon and other weapons of the Moros, are worthy of attention.

SUMATRA AND JAVA

In Hall G a large model of a village in Sumatra, Dutch East Indies, makes it hard



IGOROT OF PHILIPPINES—HALL 3*



HAWAIIAN SURF RIDER—HALL 3*

to realize that such beauty could be shattered by one bombing plane in a few moments. Javanese handiwork from the same region shows what a rich heritage of handicraft—brass, dyes, elaborate costumes, and fine jewelry—these people possess. Also in Hall G are exhibits pertaining to the peoples of Madura, Borneo, Formosa, and other parts of the Malay Peninsula and Archipelago.

No matter where his interest may be directed in this representative collection from the Pacific Ocean, a visitor will realize the important work of this and other institutions. In small compass is gathered undisputed testimony to the skill and intelligence of peoples of several races who are scattered over an enormous region. Here today the rich inheritance is threatened by forces of destruction. The future guidance, even the very existence of the inhabitants is at stake.

Meteorites and Miracles

Superstitious people often associate meteorites with miracles. One such meteorite,

having an elaborate legendary history as having fallen to earth as a block of gold, then having been changed to silver, and finally to iron as a punishment of God visited upon a certain tribe of Arabs for their avarice, is represented by the Tamentit specimen in Hall 34.



MENANGKABAU VILLAGE, SUMATRA—HALL G

A graphic synopsis of facts about the sugar industry is presented in the Hall of Food Plants.

TESTIMONIAL VOLUME PUBLISHED IN HONOR OF DR. OSGOOD

In tribute to the many scientific accomplishments of one of Chicago's, and America's, most eminent scientists—Dr. Wilfred Hudson Osgood, Curator of Zoology Emeritus—Field Museum of Natural History published last month a testimonial volume of some 400 pages, under the title *Papers on Mammalogy*. The book constitutes Volume 27 of the Zoological Series of publications.

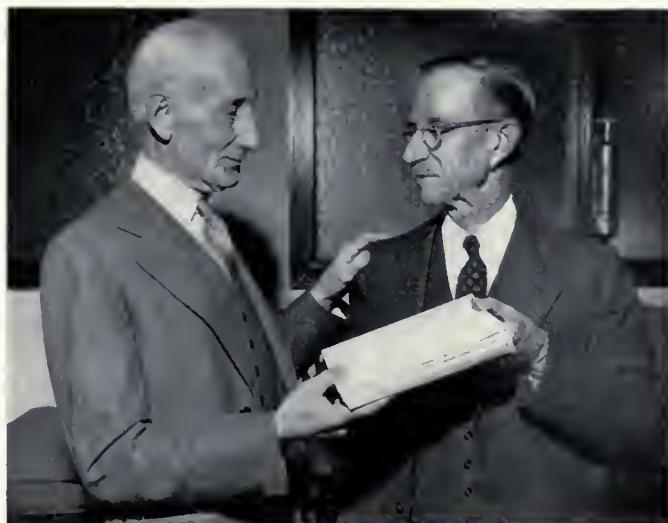
It opens with two dedicatory articles. One is by Mr. Stanley Field, who became President of the Museum in 1909 (the same year that Dr. Osgood joined the staff) and has continued at the head of the institution's Board of Trustees ever since. The other is by Major Clifford C. Gregg, Director. Mr. Field and Major Gregg both express their appreciation of Dr. Osgood, as a man and as a scientist, and both relate interesting reminiscences of the zoologist's eminent career. In the pages that follow the biographical sketches appear eleven scientific articles by mammalogists on the staff of Field Museum, and by colleagues of Dr. Osgood on the staffs of other institutions both in this country and abroad. The book is illustrated with both collotype plates and text-figures, and is one of the most elaborate works to be printed by Field Museum Press. The volume was published on December 8, which was Dr. Osgood's sixty-sixth birthday, and it was presented to him on that date by President Field, simultaneously with the beginning of international distribution of the edition of several hundred copies to scientific institutions and scientists.

FORTY-FOUR YEARS OF RESEARCH

Dr. Osgood's scientific career covers a span of forty-four years. A graduate of Stanford University, Dr. Osgood took his Ph. D. degree at the University of Chicago. For twelve years prior to coming to Field Museum, he was a biologist on the staff of the United States Biological Survey. His thirty-two years of association with Field Museum began July 1, 1909, when he joined the staff as an Assistant Curator. He became Chief Curator of the Department of Zoology in 1921, and continued in that capacity until his retirement from active service on December 31, 1940. Since retirement, Dr. Osgood has retained his association with the Museum as Curator

Emeritus, and has continued the pursuit of various important researches with undiminished enthusiasm.

Contributors of the scientific papers included in the volume dedicated to Dr. Osgood are: Glover M. Allen, Curator of Mammals, Museum of Comparative Zoology, Cambridge, Massachusetts; H. E. Anthony, Curator of Mammals, American Museum of Natural History, New York; Angel Cabréra, Professor of Paleontology, University of La Plata, Argentina; D. Dwight Davis, Curator of Anatomy and



Photograph courtesy of THE CHICAGO SUN

TRIBUTE TO AN EMINENT SCIENTIFIC CAREER

Mr. Stanley Field (left), Museum President, presents testimonial volume to Dr. Wilfred Osgood, Curator of Zoology Emeritus, in honor of 44 years of research.

Osteology, Field Museum; Edward A. Goldman, Senior Biologist, Fish and Wildlife Service, United States Department of the Interior; E. Raymond Hall, University of California Museum of Vertebrate Zoology; A. Brazier Howell, Department of Anatomy, the Johns Hopkins University; Remington Kellogg, Curator of Mammals, United States National Museum; Barbara Lawrence, Assistant Curator of Mammals, Museum of Comparative Zoology; R. I. Pocock, Zoological Department, British Museum (Natural History), and Colin Campbell Sanborn, Curator of Mammals, Field Museum.

Following are excerpts from the two prefaces to the testimonial volume, the first by President Field, and the second by Director Gregg:

THE WORK OF WILFRED HUDSON OSGOOD

The Trustees and Scientific Staff of Field Museum of Natural History have felt that a volume composed of papers on mammalogical topics and dedicated to Wilfred Hudson Osgood would form a testimonial to him of their appreciation of his eminence as a museum zoologist . . . Such a testi-

monial volume is the more appropriate in Field Museum's Zoological Series since this series for twenty years has borne the stamp of his editorship and thereby of his personality. This stamp, and the high level of editorial conscientiousness it denotes, is perhaps best known to the younger members of Dr. Osgood's staff. Their papers have gone through his hands, and the resulting improvements in the form of their scientific contributions reflect fundamental improvements in their very thinking.

It is not difficult to trace some of the environmental factors which made Wilfred H. Osgood a great museum zoologist. He grew up in a generation when private collections of birds and mammals still provided a great stimulus to outdoor natural history, and began his career with collecting and field observation. His connection with the "Biological Survey" began in the year 1897 while he was still an undergraduate at Stanford University. The idea of a true biological survey of the North American continent was a grand one . . . there could scarcely have been a more satisfactory background for a career as a systematic zoologist.

The development of the "closet naturalist" type is one of the pitfalls of systematic zoology which has been largely avoided in America. Dr. Osgood's career, with its constant alternation of field observation and collecting on one hand and critical study of the resulting collections on the other, exemplifies the almost ideal correlation of studies in nature with studies in museum and laboratory toward which we strive. He began with collecting expeditions in the Pacific northwest—to Alaska in 1899, to the Queen Charlotte Islands in 1900, to the base of the Alaska Peninsula again in 1902, and again to the interior of Alaska in 1903 and 1904. . . .

AUTHORITY ON SOUTH AMERICA

Within his career in Field Museum, beginning in 1909, Dr. Osgood made himself the acknowledged authority on South American mammals, his authority being based on personal knowledge from repeated expeditions to South America, supplemented by . . . exhaustive studies . . . Other notable expeditions for Field Museum took him to Abyssinia in 1926–27 and to Indo-China in 1936. . . .

Thus the background of Dr. Osgood's career is a broad knowledge of the geography of the world, and a special knowledge of the geography of birds and mammals. This background has been invaluable to Field Museum in planning and carrying out the Museum's program of exhibition, notably in its habitat groups. . . .

In his administrative relations within the Department of Zoology Dr. Osgood has been able to combine the respect and the friendship of his subordinates, to direct them, sometimes without their knowledge, and to give them a free hand in their respec-

tive divisions when this would best develop their capacities.

The great growth of Field Museum has coincided with Dr. Osgood's régime as Chief Curator of Zoology. This growth has been two-fold: in the direction of exhibition on one hand and in the development of the scientific collections and of the researches based on them on the other. No one in Field Museum's organization has played a more active or more effective part in this vital developmental period of the Museum than has Wilfred Hudson Osgood.

—STANLEY FIELD

President, Field Museum of Natural History

PERSONAL APPRECIATION

Dr. Osgood's history may be read from his successive environments. After a childhood in New England, he moved to California at the age of twelve. Ten years were spent in California, the next twelve in Washington (and in his long expeditions to Alaska), and since 1909 he has been a member of our staff and thus a Chicagoan. His first interest was in birds, beginning when, as a child, he was a collector of birds' eggs....

At Stanford University he became saturated in the traditions of the great Louis Agassiz by his association there with one of Agassiz' most brilliant pupils, David Starr Jordan....

His professional career began with the United States Biological Survey.... In the late nineties he made a trip to Alaska over White Pass and down the Yukon to Bering Sea, collecting and charting as he went. His ambition almost got the better of him in this particular trip, as his boat was so overloaded with specimens that it was swamped in the icy waters of the Yukon. It is fortunate for zoology that Dr. Osgood had become an able swimmer in his earlier years. This icy bath did not cool his enthusiasm for successive expeditions to Alaska.

On this eventful trip Dr. Osgood expressed the wish that he might traverse in a similar manner the other great rivers of the world. As the years passed, his hopes were realized to a great degree, for his research expeditions took him down the Amazon in 1912 and down the Nile in 1927. In the course of his twenty-two scientific expeditions he has visited the mountains of Abyssinia and the jungles of Indo-China, although his principal interest has been in his repeated expeditions to South America....

Dr. Osgood's research and publication exhibit the variety of his interests. A glance at his bibliography of nearly two hundred titles reveals not only many contributions to the taxonomy and nomenclature of mammals and many faunistic reports, but outstanding works of other kinds. In the field of conservation and economic zoology, there is his notable report on the fur seals of the Pribilof Islands. In mam-

malian anatomy his monograph on the marsupial *Caenolestes* is a monumental contribution. The general reader who would have an accurate story of what happens on an expedition is referred to Dr. Osgood's "Artist and Naturalist in Ethiopia...."

My own acquaintance with Dr. Osgood covers the past fifteen years, during which time it has been my privilege to witness at first hand and in his company the splendid development of the Department of Zoology, of which he was Chief Curator. In that time I have come to know him as a friend as well as a colleague.... My appreciation of him prompts this brief sketch in the hope that others may learn to know him not only as the eminent scientist that he is, but also as a well-rounded and most likable personality, a warm friend, and a genial and cooperative co-worker.

—CLIFFORD C. GREGG
Director, Field Museum of Natural History

CALIFORNIA EXPEDITION OBTAINS 8,000 CRYPTOGAMIC SPECIMENS

Field Museum's botanical expedition to California, which left Chicago on August 29, returned recently. La Junta and Manitou Springs, Colorado, Great Salt Lake, and Reno, Nevada, were visited on the journey westward. The members of the expedition, Dr. Francis Drouet, Curator of Cryptogamic Botany, and Mr. Donald Richards, of the University of Chicago, spent two weeks in northern California in the vicinities of Alturas, Redding, Dunsmuir, and Weaverville, collecting largely algae and mosses. During a week at Berkeley studies were made of specimens in the Herbarium of the University of California, and algae were collected in and about San Francisco Bay. At Palo Alto members of the party collected in the foothills in company with Dr. D. A. Johansen, of the Department of Botany, Stanford University. The northern part of the San Joaquin valley was then visited, from Los Banos to Mariposa and Yosemite, and south as far as Fresno.

Dr. Drouet spent a short time in the sandy agricultural region about Selma, and then with Dr. M. J. Groesbeck explored, for cryptogams, the hills between Porterville and Springville. The last two weeks of October were devoted to an examination of the deserts of southeastern California—from the Mojave Desert to Needles, south to Blythe, west to Palm Springs, south along the Salton Sea to Calexico, and west through the mountains along the Mexican border to San Diego. Because the state of California is too large an area for careful exploration in less than two months, the collecting became necessarily a matter of sampling the flora here and there, chiefly in regions where no such collecting had been done before. About 8,000 specimens, mostly cryptogams, were brought back for the Museum's collections.

Mrs. James Nelson Raymond Contributes to Museum

Mrs. James Nelson Raymond last month again made a gift of \$2,000 to Field Museum, bringing the total of her contributions in 1941 to \$6,000. The gift is for the maintenance of the varied activities of the James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures. Mrs. Raymond established this Foundation in 1925, as a memorial to her husband, the late James Nelson Raymond, and at that time she provided a large endowment for its support. Every year since she has made further liberal contributions for the current expenses of conducting its work.

The Raymond Foundation sends lecturers into the schools to provide supplementary education in the natural history field for the hundreds of thousands of children of this city and suburbs; conducts tours of the exhibits for groups of children brought to the Museum; provides several series of motion pictures and other programs every year which children may see, free of charge, in the James Simpson Theatre of the Museum; and engages in many other forms of educational endeavor.

The Wild Life of Illinois in Post-glacial Time

Fossil vertebrates of post-glacial time, collected in central Illinois by Mr. Edwin C. Galbreath, and presented by him to Field Museum, show that the wild life of this area was once much more diversified than it is now. These fossils were collected near Polecat Creek in Coles County. Included in the finds were bones of the mastodon, the deer-moose, the ground sloth, and the giant beaver, all of which are now extinct. The cotton-tail, shrew, turtle, and muskrat are still with us, as well as an occasional raccoon. The coyote has at times been seen near Chicago in recent years. Early records of white settlers indicate that they found deer and wapiti, wolf, bobcat, bison, and turkey, but the musk-ox and grizzly bear disappeared before the white man came. The skull of an Indian, and the jaw-bone of an Indian dog, show that at least some of these animals were contemporaneous with man. The woods found—hickory, elm and tamarack—indicate a climate not much different from that of the present.

False Fossils

Some young men once brought bones dug up in a field near Chicago to Field Museum for identification. When the paleontologist told them the specimens were not fossils, but common modern horse bones the visitors were dubious, and asked how such bones could occur six feet under ground. As gently as possible the paleontologist inquired what they thought farmers did with their dead horses.

STUDY OF INDIANS PROMOTES HEMISPHERE SOLIDARITY

By ALEXANDER SPOEHR

ASSISTANT CURATOR OF AMERICAN ETHNOLOGY AND ARCHAEOLOGY

In this time of world crisis we have become acutely aware of the importance of Latin America for our own defense. As a result, the air has been filled with pronouncements of good-will toward our southern neighbors. Yet a policy of well-wishing alone can never bridge the gap created by the differences in language, culture, and tradition between Latin and Anglo-America. A more solid basis is necessary for improving our relations with the nations to the south. A promising approach is an honest attempt on our part at finding a wide range of interests and problems which we have in common with Latin America and on which we can work jointly with them. In defining these common problems and in promoting a sounder understanding of them, anthropologists can do their bit.

Among other things, anthropology is concerned with the study of the American Indian. Before the time of Columbus, Indians lived in the entire New World, from the Arctic to the Straits of Magellan. Today there are countries where there are few or no Indians left, yet every nation in the New World has a certain heritage of Indian culture. And in every country of North, Central, and South America there can be found the ancient remains of Indians long since dead. The Indian is therefore a sort of common denominator of the New World. In studying him we have something which concerns both Latin America and our own United States.

The anthropologist is interested both in past phases of Indian civilization and in the Indian as he is today. The former interest is the domain of the archaeologist. At the present time the ancient history of the New World is being unraveled by the efforts of archaeologists of both this country and Latin America. From their joint efforts we may expect in the future a wider appreciation of the history of the Indian civilization. In the meantime, the ties between practicing archaeologists of the United States and those of Mexico, Peru, and other Latin American countries become closer. At the present time Field Museum is co-operating in such a program through the research of Mr. Donald Collier, Assistant Curator of Ethnology, who is on an expedition in Ecuador. Although archaeologists are only a small group, if the same policy is followed in other fields of research a much larger body of scientists will be involved. Currently, Field Museum's Department of Zoology has Mr. Colin C. Sanborn, Curator of Mammals, on an expedition in Peru; the Department of Geology has Mr. Paul O. McGrew, Assistant Curator of Paleontology, in Honduras; and the Department of Botany has Dr. Julian A. Steyermark, Assistant Curator of the Her-

barium, in Guatemala, and Mr. Llewelyn Williams, Curator of Economic Botany, in Venezuela.

Study of the Indian as he is today perhaps carries a wider appeal than study of his ancestors. Not only the anthropologist is concerned with modern Indian communities and in comparing them with our own and other societies—there is also the artist interested in present Indian arts and crafts, and the government official who must administer Indian affairs. In respect to the latter, one notes with interest the recent formation of the Inter-American Indian Institute, whose purpose is to further the solution of problems relating to the cultural, social, and economic progress of the Indian. This organization has anthropologists and government officials of both the United States and the countries of Latin America on its board of directors.

Our ties with Latin America cannot be strengthened and improved overnight. A sincere attempt at increasing knowledge and understanding of common problems in many fields of endeavor is a sound way of promoting enduring sympathy and good-will. Although Indians may seem of only academic interest to many people, they still serve as one of the many bonds which we have in common with the other nations of the western hemisphere.

THINGS YOU MAY HAVE MISSED

The Hartebeest

The hartebeest, or kongoni, sometimes called the "policeman of the plains," gives the impression of being a self-appointed guardian of all other animals, often seeming to risk its own life to warn other herds of approaching danger. Why this protective attitude is assumed is not known, but the



"POLICEMAN OF AFRICAN PLAINS"

The hartebeest, a sentinel among the African antelopes whose vigilance warns other animals of approaching peril.

FIELD MUSEUM HONOR ROLL

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kongoni, with its ostensible self-sacrificing qualities, would be an ideal hero for an animal story.

The hartebeest exists in large numbers in nearly every part of east Africa and is the most abundant horned animal to be found there. It is readily distinguished from other antelopes by its appearance, being a big, awkward animal with a long, thin face. The face bears an amused, quizzical look, and many visitors seeing it for the first time are curiously reminded by its expression of some friend or acquaintance. The bracket-shaped horns are relatively short and thick, and are mounted on a pedicel of moderate height. The general color is bright rufous fawn with the lower portion of the animal paler. It is in the horns that the chief differences of species lie, with less obvious differences in stature and coloring.

The kongoni, which may be observed in small herds of from six to ten, are found on the flat open plains in east Africa, near practically every other kind of game (wildebeests, zebras, elephants, topis, etc.). They have unusually keen eyesight, and their protection of associated animals by their constant watchfulness, together with their keen scent for water, make them clearly useful as sentinels and guides. Usually rather silent animals, their only sound is a kind of gasp or sneeze which is used as a warning signal.

Three species of hartebeest may be seen in Field Museum. Two of them, Coke's hartebeest and Lichtenstein's hartebeest, are to be found in George M. Pullman Hall (Hall 13—Hoofed and Horned Mammals), and a habitat group of Swayne's hartebeest is in Carl E. Akeley Memorial Hall (Hall 22—African Mammals).

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promptly of changes of address.

FIELD MUSEUM AND MORALE

"These are the times that try men's souls."

Confident of ultimate victory though we are, and must be, through all the "blood, and sweat, and tears," there are periods when the fortunes of war for a time, at least, may go against us, as for other nations engaged in the titanic world struggle. There may be times when our morale will be tested to the breaking point—times when dismay may perhaps nearly engulf us.

When such times come, your Museum is a haven for mental and spiritual rehabilitation. The morale-building virtues of this and kindred institutions are recognized by Army and Navy authorities. Groups of soldiers, sailors, marines, and coast guardsmen when on leave or furlough are constantly directed to the museums by those in charge of recreation activities. They come in large numbers, and they do enjoy their visits. Civilian morale, likewise, can derive great benefits if cultural institutions are permitted and aided to "carry on" as usual in wartime.

The Museum itself has stood and continued its development, a symbol of the American spirit, through two previous major wars of the United States. In the present conflict the administration of this institution has full confidence that it, like the nation to which it belongs, will come through with flying colors, greater than ever before.

Reflecting on this, one is led to new courage by the larger concept of the persist-

ence of the things which the Museum represents in the face of all evil and distress. Science marches on, Man continues to progress. The Museum collections teach that the fundamentals of the earth, the elements of existence, remain solid despite all travail.

Within the walls of Field Museum we have a microcosm of all life through all the ages. The things which the Museum collections stress are the things which are eternal—the things that constitute proof that we shall survive present and future ordeals as we have those of the past, despite all destructive forces let loose against us. Here, while we may be impressed with the fleetness of that instant of geological time which we are permitted as individuals upon this earth and therefore with our own unimportance as single entities, we are equally impressed with the gallant obstinacy of the life force in the race, all races—human, plant, and animal—against all odds. Our paleontological collections and the data our scientists have deduced from them tell us that it took nearly a billion and a half years of life before living creatures evolved through their many stages from the lowest forms of minute one-celled plants through the Ages of Fishes, Reptiles and Mammals to reach what we regard (perhaps fondly) as the ultimate expression of creation—Man. And Man, throughout his brief million years or so on this planet, and despite his almost continuous, illogical and malignant efforts to exterminate his own race, has never succeeded. Instead the human race has grown tremendously in numbers, and to some slight degree, at least, in civilization despite the many plague spots of barbarity which may seem to belie this fact as we gaze around the contemporary world.

When morale is low, science, like religion, offers new courage and new strength. We sincerely believe that any despairing person, visiting the Museum and allowing himself to reflect upon what he sees and learns, will be cheered by it and by the thoughts it will stimulate in him. He will leave this temple of knowledge with restored resolve and renewed strength. This in turn will be effective in stiffening his determination to do his full part in the all-out effort required from every citizen, in uniform or otherwise, to carry America and the principles she stands for to victory over those whose creed is based on the lies and cruelties and slavery of Nazism and its counterparts.

Staff Notes

Mr. James H. Quinn, Chief Preparator in Paleontology, has gone east to spend some weeks in studying preparation and installation methods used in other museums.

Mr. Colin C. Sanborn, Curator of Mammals, who is collecting mammals, birds,

reptiles, and fishes in southern Peru, reports that his work is progressing favorably. He will proceed through two of the coastal valleys and revisit the tropical forest in southeastern Peru before his return to Chicago in March.

Mr. Rudyard Boulton, Curator of Birds, lectured at Amherst College, Massachusetts, on December 8 to the faculty Science Club on "Speciation In Birds." He also gave a lecture on December 16 before the Humane Society of Baltimore County, Maryland, on "Darwin's Trail in the Galapagos."

Mrs. Leota G. Thomas, of the Raymond Foundation lecture staff, spoke before the general meeting of the Mid-West Section, Science-Mathematics Association (N.E.A.) on "The Use of Museums in the Teaching of Science."

Mr. Emmet R. Blake, Assistant Curator of Birds, recently gave an illustrated lecture at the Chicago Academy of Sciences on the results of last summer's Field Museum Ornithological Expedition to the Southwest.

The Society for Research on Meteorites has appointed Mr. Henry W. Nichols, Chief Curator of Geology, as a member of the Committee on Legal Ownership of Meteorites and the Committee on Terminology.

Remarkable examples of lacquer work, with pictures recording ancient historical events, are included in an Inca exhibit in Stanley Field Hall.

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.

NOTABLE WORK ON REPTILES NOW IN MUSEUM LIBRARY

The ambitious project for a *North American Herpetology* to illustrate all of the amphibians and reptiles of North America was formed by Dr. John Edwards Holbrook of Charleston, South Carolina, in the eighteen-thirties, and was carried to completion in five quarto volumes by 1842. The Library of Field Museum has recently acquired a set of the rare first edition.

The work was published by subscription, appearing in successive parts beginning in 1834. It was printed in Philadelphia by J. Dobson. The plates were drawn by various artists, and Dr. Holbrook seems repeatedly to have recalled plates which he himself regarded as unsatisfactory, substituting new ones. After the completion of four volumes (1834-1840), the whole work was reissued as a second edition in five volumes, dated 1842.

Holbrook is reputed to have destroyed, by bonfire in his backyard, the issues recalled from his subscribers. From the rarity of the fourth volume, it was long supposed that most of the issue of this volume of the first edition had not been distributed. Inquiry at the principal libraries which might be expected to have a first edition brings to light only seven complete four-volume sets, and not much more than that number with the first three volumes. The Field Museum set proves to be the one reported by Dr. Bohumil Shimek in 1924, then apparently only the second complete set known.

A copy of volume five of the second edition was included in the set recently purchased by Field Museum. This proves to differ in various particulars from the corresponding volume in the set of the second edition in Field Museum Library. Such discrepancies between individual volumes are to be expected in view of the author's continued attempts to improve the work as a whole by remaking individual plates and revising parts of the text.

A work of the nature of Holbrook's *North American Herpetology*, in addition to its interest to bibliophiles for its rarity and its importance in the history of the study of its subject in North America, continues to be of direct value in the taxonomic studies pursued by means of the Museum's reference collections. While it is true that many of its descriptions and all of its classification may prove to be long out of date, the improvement of the definition of the species already known and the establishment of the geographic forms known as subspecies require constant reference to the original descriptions and plates. Exactness of method in bibliography is of as much importance as in other techniques of science; thus the availability of the first edition of Holbrook in Chicago is a valuable permanent addition to the bibliographic resources of the middle west.

—K.P.S.

BOYS AND GIRLS OF "FOUR-H CLUBS" VISIT FIELD MUSEUM

Again last month, as for many years past, Field Museum was host to hundreds of visitors who were in Chicago from all states of the Union to attend the annual International Live Stock Exposition.

It has always been one of the highest rewards of Museum service to welcome the selected representatives of America's rural

its exhibits, and their arrangement was given for the groups in the James Simpson Theatre by lecturers of the James Nelson and Anna Louise Raymond Foundation. Following this, especially prepared pictorial floor plans of the Museum were given each boy and girl. The staff guides were introduced and stationed in various Museum



Photograph by C. J. Albrecht

"HEAD, HEART, HANDS AND HEALTH"—

—that's what the "Four H's" stand for, and the ideals of the National Congress of 4-H clubs are well exemplified by these young ladies, selected from among America's rural youth. 1,600 4-H girls and boys recently visited Field Museum.

boys and girls, brought to Chicago by the National Congress of 4-H Clubs. They represent the cream of all farm youth, and upon them rests a substantial part of the nation's hopes for the citizenship of tomorrow. Of this selected group more than 700 girls and 900 boys visited the Museum on December 2 and 4. It is a privilege for the Museum to contribute to the mental development of boys and girls of this type.

In order to make their Museum visit more enjoyable and to allow each individual to see what he was most interested in, a short illustrated explanation of the Museum,

halls to answer questions as the young people spread out among all divisions of the exhibits.

The comment of one of the boys as he left the Museum is expressive of the general reaction: "Two weeks would have been better than two hours here!"

As in previous years a loan of eight of the traveling exhibits of the N. W. Harris Public School Extension was made for display in a booth at the Live Stock Exposition in the Union Stock Yards. During the stock show (November 29 to December 6) these exhibits were viewed by thousands—adults and children alike.

A Strange Cultural Coincidence

Shoe-shaped pots, formerly used by Malagasy herb doctors for brewing medicines, are exhibited in Case No. 7 of the Madagascar collection in Hall E of Field Museum. These have been found to be identical in form with pots discovered across the world in the ruins of sites once occupied by prehistoric Indians in the southwestern United States. However, in the studied opinion of Dr. Alexander Spoehr, Assistant Curator of American Ethnology and Archaeology, this is pure coincidence—there is not

the slightest reason to suspect any cultural or historical relationship between the peoples of these widely separated and wholly different geographic and racial origins.

Sulphides, chlorides, oxides, carbonates, silicates, sulphates, phosphates, hydrocarbons, etc.—

Are most of these just names to you? You can become acquainted with what they are, and what they look like, by a study of the exhibits in the Department of Geology's Hall of Minerals (Hall 34).

JANUARY SUNDAY LECTURES ON PREHISTORIC LIFE

Go through the halls of Field Museum with Mr. Paul G. Dallwig, the Layman Lecturer, and live 600 million years in a single Sunday afternoon.

That's the opportunity presented in the Layman Lectures on "Nature's 'March of Time'" to be presented each Sunday during January. Illustrating his subject with the vast collections of fossil animals, and the restorations in mural paintings and dioramas showing them as they appeared in life, Mr. Dallwig will carry his audience through the principal stages of animal life from the earliest fishes, reptiles, and mammals to the beginning of Man. In dramatic form he will present such features as a trip into a luxuriant carboniferous forest of 250 million years ago; a fight, typical of the ceaseless struggle for existence, between those giant dinosaurs, *Tyrannosaurus* and *Triceratops*; and the stories of actual Museum expeditions which collected most of the fossil specimens in the collection.

Because of heavy public demands, it is necessary to limit each audience to 100 adults (*children cannot be accommodated*). Those desiring to attend must make reservations in advance by mail or telephone (WABash 9410). The Sunday lectures begin promptly at 2 P.M. and end at 4:30. Midway there is an intermission for refreshments and smoking in the Cafeteria.

In February Mr. Dallwig's subject will be "Digging Up the Cave Man's Past."

WEEKDAY LECTURE TOURS OFFERED IN JANUARY

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:

Thursday, January 1—no tour, New Year's Day (Museum closed); Friday—Men of the Old Stone Age (Miss Elizabeth Hambleton).

Week beginning January 5: Monday—Animals and the Uses We Find for Them (Miss Elizabeth Best); Tuesday—General Tour; Wednesday—The Shaping of the Earth's Surface (Bert E. Grove); Thursday—General Tour; Friday—The Earth's Green Mantle (Miss Marie B. Pabst).

Week beginning January 12: Monday—High and Low in the Animal Kingdom (Miss Elizabeth Best); Tuesday—General Tour; Wednesday—Animals of the Past and Present (Bert E. Grove); Thursday—General Tour; Friday—Prehistoric Man and Modern Races (Mrs. Leota G. Thomas).

Week beginning January 19: Monday—Family Life Among Some of the More Familiar Animals (Miss Elizabeth Best); Tuesday—General Tour; Wednesday—The Importance of Rocks and Minerals (Bert E. Grove); Thursday—General Tour; Friday—Plants of the Past (Miss Marie B. Pabst).

Week beginning January 26: Monday—The Variety of Animals in North America (Miss Elizabeth Best); Tuesday—General Tour; Wednesday—Animals Native to the Chicago Region (Mrs. Leota G. Thomas); Thursday—General Tour; Friday—Plants of the Past (Miss Marie B. Pabst).

Persons wishing to participate should apply at North Entrance. Tours are free.

GIFTS TO THE MUSEUM

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

Department of Anthropology:

From Charles A. Stanley, Tsinan, China—15 sherds and a stone implement, China.

Department of Botany:

From Illinois State Museum, Springfield, Ill.—162 herbarium specimens, Illinois; from Professor Ray J. Davis, Pocatello, Idaho—49 herbarium specimens, Idaho; from C. C. Deam, Bluffton, Ind.—10 herbarium specimens, chiefly Indiana; from Paul H. Allen, Balboa, Canal Zone—38 herbarium specimens, Panama; from Professor J. Soukup, Lima, Peru—135 herbarium specimens, Peru; from Dr. Hermann Kleerekoper, Rio Grande do Sul, Brazil—12 specimens of algae, Brazil; from Dr. V. W. Lindauer, Far North, New Zealand—29 specimens of algae, New Zealand; from Henry S. Dybas, Chicago—73 specimens of Polyporaceae, Mexico; from Dr. Lee Walp, Marietta, Ohio—36 specimens of Myxophyceae, Ohio, Pennsylvania, and North Carolina; from Dr. Walter Kiener, Lincoln, Neb.—218 specimens of soil algae, Nebraska.

Department of Geology:

From Reverend Michael M. Ries, Chicago—5 geodes and parts, Iowa; from James H. Quinn, Chicago—skeleton of fossil rhinoceros *Teleoceras*, Nebraska.

Department of Zoology:

From C. M. Barber, Hot Springs, Ark.—45 salamanders and a snake, Arkansas; from Rockefeller Foundation, Rio de Janeiro, Brazil—11 miscellaneous Brazilian birds; from Dr. T. E. Musselman, Quincy, Ill.—an albino English sparrow, Illinois; from Dr. David Davis, Rio de Janeiro, Brazil—4 birds, British Guiana; from Carl F. Kauffeld, Staten Island, N. Y.—2 timber rattlesnakes, eastern United States; from Boardman Conover, Chicago—a bufflehead duck and 3 miscellaneous bird skins; from Rupert L. Wenzel, Chicago—408 beetles, Brazil, and 574 insects and allies, Illinois and Indiana; from Henry S. Dybas, Chicago—159 insects and allies, Illinois and Indiana; from Fromm Brothers, Hamburg, Wis.—5 foxes, Wisconsin; from Dr. Henry Field, Washington, D.C.—281 insects and allies, Illinois, Maryland, Virginia, and Florida; from Gordon Gunter, Rockport, Tex.—86 fish specimens, Texas; from D. Dwight Davis, Naperville, Ill.—50 young garter snakes; from Chicago Zoological Society, Brookfield, Ill.—8 miscellaneous birds and a hog-nosed snake; from John G. Shedd Aquarium, Chicago—4 fish specimens, Atlantic coast of the United States; from Mrs.

H. E. Frizzell, Negritos, Peru—2 snakes and a lizard, Peru.

The Library:

Valuable books from Elmer S. Riggs and Karl P. Schmidt, both of Chicago; and Carnegie Institution of Washington (D.C.).

NEW MEMBERS

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

Contributors

William Benson Storey*

Associate Members

Mrs. Eugene W. Kettering, Dr. Elizabeth Thompson Koppenaal, David A. Lawson, Mrs. John J. Louis, Mrs. Thomas B. Marston, Mrs. Helen C. Murphy, Charles T. Wegner, Jr.

Annual Members

H. C. Bruhn, Charence P. Clark, Walter W. Cruttenden, Joseph H. Czerwiec, Mrs. Charles P. Galanti, Dr. John J. Gregory, Dr. Ralph C. Hamill, L. Ross Hanawalt, Helmer Hansen, Miss Lucy C. Hayes, Francis Heisler, G. B. Hurley, Ralph C. Jennings, Samuel Kaplan, Philip Lochman, James M. Mills, Charles L. Moorman, Richard I. Olson, Benjamin Samuels, Harry R. Spellbrink, Elmer G. Wellin.

*Deceased

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.

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MODEL SHOWS CASSAVA MILL PRODUCING SOUTH AMERICA'S "STAFF OF LIFE"

BY B. E. DAHLGREN

CHIEF CURATOR, DEPARTMENT OF BOTANY

Cassava is known in the United States chiefly as the source of tapioca, a special starch product imported generally from the Dutch East Indies. It is obtained from the starchy tubers of a spurge resembling a small-leaved, shrubby castor bean plant. The cassava plant is, however, a native of

America. Its use as food has been adopted by the white settlers of that region and has become firmly established over large areas east of the Andes where, even at the present time, it is rivaled in importance only by two other indigenous food plants, namely, maize and beans.

Cassava exists in many varieties, especially numerous in Brazil, but for practical pur-

The preparation of this was a regular household chore among the Indians. It involves several steps or operations: grating the tubers, squeezing out the juice, and drying, with or without artificial heat—all performed with simple implements, and sometimes preceded by preliminary maceration in water.

The cassava grater of the Indians was



DIORAMA SHOWING IN MINIATURE A FARINA MILL IN BRAZIL

A new exhibit in the Hall of Food Plants (Hall 25). In the real mills of this type, the machinery is operated by a horse going around a circular path resembling a merry-go-round, as shown above. In the foreground to the right a man with a mule is delivering fresh tubers brought from a cassava field such as that adjoining the grounds behind the buildings.

tropical America and was cultivated in pre-Columbian times by the Indian inhabitants of the Antilles, as well as of Central and South America, and was one of their most important food plants. Its common name in most Spanish speaking countries is "yuca," the original Haitian name for the plant. In Argentina, Brazil, and Paraguay it is called "manioc" or "mandioca." The botanical name *Manihot* is apparently a derivative of this. Cassava, the West Indian name for bread from yuca tubers, has become the common English name for the plant, which still remains the chief food plant of the Caribs, Tupys and other Indians of the northern part of South

poses two main kinds are commonly recognized and have been described as separate botanical species, viz. bitter cassava and sweet. They are carefully distinguished by growers, the bitter requiring special care since it contains a large amount of a poisonous substance, hydrocyanide or prussic acid, which is found also in bitter almonds, plum and cherry kernels, etc. Fortunately this is a volatile compound, readily removed by heat, and both kinds of cassava may be eaten boiled or roasted, though for such purpose white or sweet cassava is preferred. Cassava is, however, most commonly consumed in dry granular form, known as farina or farinha.

usually a piece of wood or board studded with small sharp stones set in drilled holes and firmly fixed with resin or pitch. This has now been displaced almost everywhere by a piece of tin perforated with a nail. The cassava squeezer, like the sieve and baskets for transportation of the dry meal, is made of the common tropical American basketry material, viz. splints from the periphery of the hard smooth stems of a marantaceous reed. This material is woven into the form of a tube, four to six inches in diameter and as many feet long, supplied at both ends with a transverse loop. The grated cassava pulp is packed tightly into this tough and flexible basketwork tube,

called "matapi," or "tipiti." The tube, suspended by one loop on a stout branch of a tree, is subjected to traction and consequent reduction in diameter by means of a lever passed through the loop below. The pulp, thereby subjected to pressure, gives up most of its juice. The liquid, which is caught in a suitable vessel, is rendered innocuous and thickened by boiling, and finally goes into the pot.

It has a preservative action important in the simple household economy of the indigenes of the tropics, where food not immediately consumed remains in the pot as stock for the next day's meal. In British Guiana this thickened cassava juice may be had as "cassareep," serving for the preparation of pepperpot; on the Amazon it is known as "tucupy," esteemed for the preparation of dishes of fish and turtle, and for a highly seasoned tapioca broth called "tacacá."

The squeezed cassava pulp may be dried over the fire and smoked for preservation, or may be broken up, dried, and passed through a sieve. Slightly moistened it may be formed into wafer-like cakes, to be dried in the sun, often on top of the palm-thatched roof, or baked on a hot stove. Usually, it is preserved in dry granular state, in wide-meshed baskets, lined and covered with large leaves, and is marketed locally in such receptacles. It is consumed dry, mixed with other food, or stirred into water.

The preparation of farina on a somewhat larger, semi-industrial scale may be observed in the small farina mills which are common in rural districts in northeastern Brazil. The essential procedure is the same as that practised by the Indians, but the implements used are more effective.

A diorama recently installed in the Hall of Food Plants (Hall 25) in Field Museum represents a small farina mill in northern Ceará. Like all substantial buildings in the region, it is constructed of brick and tile, generally made on the grounds or nearby, and supplemented with trunks of the local Brazilian wax palm for rafters. Since the factory building is in effect only an open shelter, the operations within may be watched readily from outside.

In the foreground to the right a man with a mule is delivering fresh tubers brought from a cassava field such as that adjoining the grounds behind the buildings. Heaps of tubers are scraped or peeled by women seated on the floor. They are then carried to a horse-operated mill in which they are rasped or ground to pulp. The pulp is placed in stout sacks and subjected for some time to pressure in a heavy press made of substantial timbers. This operation serves to crush the pulp more completely and to remove the juice. The contents of the sack are then emptied into a box-like sieve which retains all fibrous material but allows the starchy pulp to pass. This is then transferred to a large shallow pan heated by a wood or charcoal fire. With constant

stirring, the drying mass of starchy pulp is broken up in this pan into the form of dry particles known as farina. In large areas of South America where wheat and other small grains cannot be grown this form of cassava starch may well be said to be "the staff of life" and virtually takes the place of bread.

When finely powdered cassava starch is desired the tubers, whole or grated, are macerated in water, and after some time are easily broken up by hand. The fiber and coarse particles are then removed by repeated straining. The starch contained in the liquid settles to the bottom of the container after which the water is decanted off. It is used in this country chiefly as sizing for cotton goods and is said to be an excellent laundry starch.

Cassava flour is not suitable for bread making, but in Brazil the addition of a small proportion of it to all wheat flour is prescribed by law as a measure of national economy—with not entirely fortunate results. Only certain kinds of small cakes called "bejus" are made from cassava flour alone.

When the plant was introduced into the East Indies the process long in use there for the preparation of sago from palm starch was applied to cassava. The product obtained by the agglutination in moist state of small masses of swollen cassava starch, separated and rounded by being shaken or agitated during drying and a light roasting, became known as pearl tapioca. The exact procedures used in different localities, e.g. Java and Singapore, differ in details. The Straits Settlements and Java have long been the main exporters of this starch product, while Brazil, the largest grower, adheres chiefly to the production of farina for home consumption.

The new diorama in Hall 25 is supplemented in a near-by case (Case 24) by an exhibit showing cassava tubers and various cassava products prepared by South American Indians. A reproduction of a sweet cassava plant is found in Case 867 in Martin A. and Carrie Ryerson Hall (Plant Life—Hall 29). The diorama was prepared in part by WPA workers, and completed by Mr. Emil Sella, Chief Preparator of Exhibits. The background was painted by Mr. John Conrad Hansen, an artist who has also made many paintings restoring prehistoric animals for the Department of Geology.

RAYMOND FOUNDATION OFFERS PROGRAMS FOR CHILDREN

A special program commemorating the birthday of George Washington will be presented for children at Field Museum on Saturday morning, February 21, under the auspices of the James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures. Other children's programs will be given by the Raymond Foundation, in its regular spring

FIELD MUSEUM HONOR ROLL

Now in the Service of their Country:

Theodore Roosevelt, Trustee—Brigadier-General, U.S. Army.

Joseph Nash Field, Trustee—Lieutenant, J. G., U.S. Navy.

Clifford C. Gregg, Director—Major, U.S. Army.

Melvin A. Traylor, Jr., Associate, Birds—Private, U.S. Marine Corps.

Dr. John Rinaldo, Associate, Southwestern Archaeology—Private, U.S. Army.

Patrick T. McEnery, Guard—Master-at-arms, U.S. Navy.

John Syckowski, Guard—Chief Commissary Steward, U.S. Navy.

George Jahrand, Guard—Chief Water Tender, U.S. Navy.

M. C. Darnall, Jr., Guard—Candidates' Class, U.S. Marine Corps Reserve (Officers' Training Course).

James C. McIntyre, Guard—Private, U.S. Army, Coast Artillery.

Clyde James Nash, Guard—Chief Gunner's Mate, U.S. Navy.

series, each Saturday morning throughout March and April.

The special program on February 21 is presented under the general title "Glimpses of Our Country Today." The films to be presented, mostly with sound effects, and including two in natural colors, are: "Washington, D.C.," "Ohio River Steamboats," "Colorful California," "America's High Spots," and "Pledge of Allegiance."

The opening program in the spring series, to be given on March 7, is "Family Afoot in the Yukon Wilds." This presents, in natural color motion pictures, the story of the pioneer-like travels of Billy and Jo-Evelyn Albee, aged 8 and 5 respectively. With their father and mother, Mr. and Mrs. William Albee, they "hiked" for hundreds of miles in northern Canada and Alaska, during which they had many adventures with animals and Indians. The films will be accompanied by a vivid narration by Mr. and Mrs. Albee who will appear personally on the program.

Both the special Washington's birthday program, and all the regular spring programs, will be given in the James Simpson Theatre of the Museum, and there will be two showings of each, one at 10 A.M., and one at 11. A full schedule of the spring series will appear in the next issue of FIELD MUSEUM NEWS. 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.

HOW WAR-TORN CHINA (A.D. 1035) SAVED TREASURES FOR POSTERITY

By C. MARTIN WILBUR

CURATOR OF CHINESE ARCHAEOLOGY AND ETHNOLOGY

If Chicago were threatened by imminent invasion and enemy looting, conceivably Field Museum might try to save some of its treasures and important scientific records by piling them into an obscure storeroom which would then be plastered over and camouflaged. It is a trick that has been used ever since man has kept treasures and made war. It was due to just such a situation that the Museum recently was able to acquire a Chinese manuscript on paper that had lain hidden for nearly nine centuries in a forgotten storeroom of a Buddhist temple. This ancient roll of paper, a century older than the earliest papers made in Europe, is now exhibited in a case devoted to two of China's great inventions—paper and printing (Hall 32, Case 27).

The manuscript is a scroll about five and one-half feet long and one foot wide, and on it a pious scribe named Chang copied a Buddhist sutra or religious text. The paper is a sturdy rag stock, with a grain which visibly betrays its hand-made origin. There are four sheets, each about one and one-half feet long, pasted end to end to make the type of "book" which was prevalent in China as elsewhere in the Middle Ages. The sheets were neatly ruled by lead pencil with a top and bottom margin and vertical columns. The text was copied in black ink with a brush. There is no date on the inscription, but probable limits are set by the first translation of this particular text in the latter part of the tenth century, and by the sealing up of the storeroom about A.D. 1035.

"VAULT" CARVED IN ROCK

The scroll is only one of many thousands of books, paintings, and miscellaneous papers ranging in date from A.D. 406 to 1035, that were piled into the small depository which was carved out of solid rock as an adjunct to one of the "Caves of the Thousand Buddhas" near Tun-huang in the far northwestern part of China. The room may have been bricked up and plastered over to conceal the documents from the warlike Tanguts, who over-ran the area between 1034 and 1037. The arid climate of the semi-desert region helped to preserve the contents in nearly perfect condition until by chance, in 1900, a priest discovered the hidden room while making restorations.

Measuring only about nine feet square, that little cache contained an inestimably valuable collection of documents written in many different languages besides Chinese—Tibetan, Sanskrit, Sogdian, Eastern Iranian, Uigur (Turkish) and even Hebrew—and referring to several religions other than Buddhism. The paintings found there have become a cornerstone of our knowledge of Chinese painting and of Central Asian art in general. The secular documents—census

records, deeds and wills, calendars, contracts, copy books, compendiums of maxims, and fragments of literature—are gradually being translated, revealing fascinating details of the life of that outpost of China during the brilliant T'ang dynasty.

EARLIEST PRINTED BOOK ALSO FOUND

The historical value of the collection was not appreciated until 1907, when the noted explorer Mark Aurel Stein (now Sir Mark) acquired an important part of it, including the earliest extant printed book (A.D. 868), for the British Museum. The next year Dr. Paul Pelliot, the renowned Sinologist, acquired a similar collection for the Bibliothèque Nationale of Paris. Not until an important part of the horde had gone abroad, where it has been safely preserved and carefully studied, did the Chinese government order the remainder to be transported to Peking. Field Museum's exemplar, one of the few in America, was probably one of those which "fell off the back of the cart" at the time of that removal.

THINGS YOU MAY HAVE MISSED

A Parrot That Preys on Sheep

Nature, no less than human society, places a high premium upon resourcefulness or innate flexibility which enables an individual or species to cope with new situations. History records the fates of peoples



"PRETTY POLLY'S" A PREDATOR

Because its natural food is scarce in its New Zealand habitat, this aggressive parrot, the kea, preys upon sheep.

who have failed to adapt themselves to powerful trends, and the story of once numerous birds and animals which have become extinct for similar reasons is known to all.

Not so well known, perhaps, is the story of the kea, a sturdy New Zealand parrot which not only survived changes in its environment but even altered its food habits and prospered to the extent of becoming a serious economic problem. When first discovered in 1856, keas inhabited relatively limited areas in the rugged mountains of the interior of South Island where they subsisted

upon mixed vegetable matter, insects, and worms. Scarcity of natural food in this bleak habitat doubtless limited the distribution and abundance of keas at that time.

Permanent European settlements were established on South Island in 1839. Sheep ranching became the principal occupation and soon vast flocks grazed over the highland valleys and plateaus. The aggressive keas were not long in utilizing this new source of food. In 1867 wounds were found in the loins of many sheep of Otago Province and in some instances even the entrails were seen hanging from the ripped sides of the abdomen. Within a year investigators discovered keas attacking flocks of sheep which were snowed in. They were amazed by the strength and ferocity of the birds, which they saw literally tearing the flesh from living animals.

The kea population thrived upon this unaccustomed diet and extended its territory as new sheep ranges were opened. Fortunately, the carnivorous tendency of an otherwise harmless and interesting bird is an acquired rather than a hereditary habit. In recent years depredations by keas have been reduced by adequate care of sick sheep and the removal of carcasses from the open range so that the parrots have less opportunity to develop their perverted taste.

A specimen of the kea is exhibited in the Museum's systematic collection of birds in Hall 21.

—E.R.B.

MUSEUM ATTENDANCE IN 1941 EXCEEDED 1,350,000

During 1941, 1,358,147 persons visited Field Museum. This compares favorably with the attendance in other years, and indicates that the institution is continuing to fill an important community need.

Paid admissions numbered 86,535, free admissions 1,271,612. The latter figure includes children, students, teachers, Museum Members, and other classifications of visitors who are admitted free on all days. The ratio of paid to free admissions is in accord with the trend of recent years.

The institution's benefits were extended also to many additional hundreds of thousands outside the Museum, through traveling exhibits circulated by the N. W. Harris Public School Extension to schools with a total enrollment of approximately half a million, and through the extension lectures provided in the schools by the James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures.

It is encouraging to note that despite the increasing demands made upon the public purse by taxes, war bonds, and other contributions for war needs, a modest gain was made in Museum memberships. There were 4,313 names of Members on the Museum rolls as of December 31, 1941, compared with 4,225 on the corresponding date of the previous year.

GIANT FLIGHTLESS BIRDS

By BRYAN PATTERSON

ASSISTANT CURATOR OF PALEONTOLOGY

A new exhibition case installed in Ernest R. Graham Hall of Paleontology (Hall 38) is devoted to giant flightless birds. It contains skeletons of a New Zealand moa and a South American phororhacoid.

The large ground birds, represented today by the ostriches of Africa and the Near East, the rheas of South America, and the emus and cassowaries of the Australian region, are of interest from several points of view. They represent an extreme of specialization in the bird world, one in which gradual adaptation to a completely terrestrial existence led to the loss of the power of flight which in turn made possible great increase in bulk. They are now, and were in the past, very few in number compared with the hosts of flying birds, a fact which suggests that evolution of such types was possible only under exceptional conditions. Finally, they afford a glimpse of a world that might have been—of the sort of beings that might have dominated the land surfaces if mammals had never existed.

ISOLATED ON TWO CONTINENTS

The past history of the living groups is not well known. Emus and cassowaries are known from the Pleistocene of Australia, ostriches from the early Pliocene of Europe and Asia, and rheas from the early Miocene of South America. These fossil forms are practically as specialized as their living relatives, indicating that the history of each group began long before its first appearance in the geological record. With the exception of that of the ostriches, it is almost certain that these histories have run their courses in the regions which the living forms inhabit. This belief is based on a wealth of evidence indicating that South America was, and that Australia has been, isolated from the rest of the world for extremely long periods of time, the former from the end of the Age of Reptiles to almost the end of the Age of Mammals, a stretch of more than fifty million years, and the latter probably from an even earlier date.

Inhabiting South America together with the rheas were the phororhacoids, perhaps the most spectacular birds of all time. A group of flesh-eaters ranging in height from less than three feet to over eight, they must have preyed on a wide variety of animals from creatures of mouse size to the larger herbivorous mammals. They were discussed at length in the March, 1941 issue of FIELD MUSEUM NEWS.

That a group of birds should have played so notable a part in the animal life of a large region is altogether exceptional and seems to have been one of the biological results of the isolation of South America. The fauna of the continent at the time that it was cut off from North America did not include any true carnivorous mammals, their places being partially filled by flesh-

eating marsupials, relatives of the opossum which were much less intelligent and effective animals. These evidently failed to become the dominant predators of the region, and the rise of the phororhacoids accordingly became possible. The extinction of the group appears to have roughly coincided in time with the reunion of the two Americas and the invasion of the southern continent by cats, dogs, and other true carnivores which came down from the north. This seems to indicate that the phororhacoids



Drawing by John Conrad Hansen

RESTORATION OF A MOA

These giant birds flourished and grew fat during millions of years in their isolated home in New Zealand, but became extinct after the arrival of Man. Their island sanctuary was invaded centuries ago by those hardy voyagers, the Polynesians, who crossed vast expanses of the South Pacific in open boats, began to colonize New Zealand. These invaders found in the moas a readily available source of food and appear to have killed off the last survivors by about A.D. 1300.

been too well under way to be materially affected by these newcomers. The extinction of the group dates from the human period and there is evidence that man had a hand in the process. *Aepyornis*, the best known form, enjoys the distinction of having laid the largest eggs of any known bird. The biggest egg yet discovered has a length of almost fourteen inches, and a greater circumference exceeding three feet. It is believed that these eggs may have come to the attention of the early Arabian navigators, and thus have contributed to the legend of the Roc which is so prominent a feature in the story of Sinbad the Sailor.

New Zealand is unique among the land masses and larger islands of the world not only in having no carnivorous mammals but in having no native land mammals of any kind. In this natural bird sanctuary a number of avian orders evolved ground-dwelling forms, many of which completely lost the ability to fly. The giants among these were a group known collectively as moas. Extremely abundant and diversified, they ranged in height from about ten feet to less than two and a half feet. In general appearance they resembled the ostriches and rheas but were heavier, especially in the legs, and probably less speedy. Their isolation and safety came to an end when Polynesian peoples, exploring the South Pacific in open boats, began to colonize New Zealand. These invaders found in the moas a readily available source of food and appear to have killed off the last survivors by about A.D. 1300.

MAMMAL INVASIONS ENDED ERA

It would appear from this record that freedom from the destructive activities of true mammalian carnivores is a prime requisite for the evolution of giant flightless birds. The occurrence of a few such groups in the northern hemisphere during the early epochs of the Age of Mammals also supports this view. At the time these were living the modern carnivores had not yet evolved, their places being occupied by the related but less specialized creodonts. After cats, dogs, weasels, etc. appeared on the scene, no more flightless giants are known to have arisen in areas to which they had access. Isolation in parts of the world to which these beasts of prey did not penetrate evidently made possible the rise and long survival of the birds discussed here.

After the passing of the dinosaurs and other giant reptiles some sixty million years ago, the mammals dominated the land and the pressure of their superior competition kept the birds largely confined to an aerial existence. Had no mammals existed, however, it is very likely that many bird groups would have reverted to terrestrial habits, and that giant forms would have been varied and widely distributed instead of being confined to a few areas where fortuitous combinations of circumstances made their development possible.

might not have come into existence had they been faced with effective competition from the start.

The lack of true carnivores in South America takes on added significance when it is realized that the Australian region, home of the emus and cassowaries, likewise contained none of these mammals until they were introduced by man. This at once suggests a correlation between a lack of true carnivores in a region and the evolution there of large flightless birds.

The large island of Madagascar has evidently been separated from Africa for many millions of years. Certainly until comparatively recent times the island was inhabited by giant plant-feeding ground birds, similar to the ostrich in general appearance but much more heavily built. They appear to have been forest dwellers, resembling in this respect the living cassowaries. Here again enemies were few, being limited to some small civets and a primitive relative of the cats. The ancestors of these mammals evidently reached Madagascar about the middle of the Age of Mammals, by accidental means—probably by flotation on natural rafts of vegetation. By that time the evolution of the ground birds must have

IF OUR LITTLE WARRING WORLD IS TOO MUCH WITH YOU, PONDER ON TWO BILLION YEARS OF THE WHOLE UNIVERSE

BY HENRY W. NICHOLS

CHIEF CURATOR, DEPARTMENT OF GEOLOGY

Not all research based on specimens in Field Museum's study collections is conducted by members of the staff. Sometimes specimens from the collections preserved in large museums are essential to important research conducted in other institutions. One such research, based on specimens from Field Museum, may be of general interest.

Researches that not so many years ago would have been laughed at as visionary, and that are still in progress, have led to estimates, widely accepted, as to how many years have passed since the material substance of the earth was created. Naturally this discovery leads to another problem: Was all the substance of the universe created at the same time, or may the substance of the earth be younger or older than that of some other parts of the universe?

It has already been discovered, through study of the radio-active content of the rocks and their disintegration products, that the atoms composing terrestrial rocks were formed about two billion years ago. No one knows whether they were actually created then, or whether profound changes in their nature were made by the influence of some universal force of a character we cannot even imagine; but it is generally accepted that they were all formed at that distant time. It is, of course, impossible to break off a piece of star or planet and bring it into our laboratory to test its age, but we have in meteorites, which may well be fragments of broken up celestial bodies, actual material substance from extra-terrestrial space. Although earlier studies have demonstrated similarities in a number of meteoritic and terrestrial atoms, leading to the inference that they were of the same age, further research for confirmation is nevertheless needed.

NEW RESEARCH METHODS

Dr. Robley D. Evans and his colleagues in the research laboratories of the Massachusetts Institute of Technology devised methods more accurate than those hitherto employed for comparing the age of certain atoms from different sources. They believed that if they could apply these methods to the study of material that came from beyond the solar system the results would be of great interest. The Pultusk meteorite, which fell in Poland as a shower of small stones in 1868, appeared to be such a meteorite, as a calculation of its orbit made by Galle in that year indicated that it came from without the solar system. Field Museum was able to supply a sufficient quantity of this meteorite for the research by Dr. Evans and his associates.

Calculation of meteorite orbits is based upon observation of the path of a meteorite as it passes through the air in the shape of

a fireball. As a meteorite fall is a startling event, coming without warning, and finished in a few seconds, and since most of those who see it are not skilled observers, these observations cannot have a high degree of scientific accuracy and the orbits deduced from them cannot be more dependable than the observations. In recent years it has been found that observations of falling meteorites are subject to psychological errors. These to a large extent can be evaluated, and allowance made for them.

After Dr. Evans' work was under way, revised calculations gave an orbit for the Pultusk meteorite entirely within the solar system so that Dr. Evans' work shows the age only of matter within our solar system and not of any from the outer spaces beyond. Dr. Evans attacked his problem by determining, through methods too complex to be detailed here, certain properties of the minute quantity of radio-active matter in the meteorites.

EXPLANATION OF "ISOTOPES"

Most chemical elements are not, as was once believed, made up of identical atoms—they are really mixtures of two or more kinds called isotopes, so nearly alike that they cannot be distinguished by ordinary means, but only by special treatments devised for the purpose. The radio-active element uranium contains two such isotopes, one of which is much more active than the other. As there is reason to believe that all uranium when first formed was made up of the two kinds in identical proportions, and as the more radio-active kind is destroyed by its radio-activity more rapidly than the other, there will be, as time passes, less and less of the more active kind present and thus, when uranium from different sources contains the same relative quantities of these, the two uranisms must be of the same age.

Dr. Evans determined the relative proportions of the two kinds of uranium in the Pultusk meteorite and in the older terrestrial rocks and found them the same, indicating that the atoms in the meteorite and in terrestrial rocks were of the same age. This research is described in detail in a Field Museum Publication (Geological Series, Volume VII, No. 5). In order to make certain that his results were correct, Dr. Evans repeated his work, using the common element potassium from the meteorite and from terrestrial rock.

Potassium, although not usually regarded as radio-active, consists of two kinds of atoms—isotopes, one of which is slightly radio-active and hence slowly disappears in time. Dr. Evans found that the proportion of radio-active to ordinary potassium is the same in the Pultusk meteorite as in terrestrial rock. These results show that some, if not all, matter in the solar system was created at the same time as that of the

earth. The question of whether some of the matter in the more distant parts of the universe may be older or younger must await the time, which may never come, when the orbit of some meteorite from without the solar system may be determined with sufficient accuracy.

Trustee Albert B. Dick Jr., Elected Museum's 3rd Vice-President

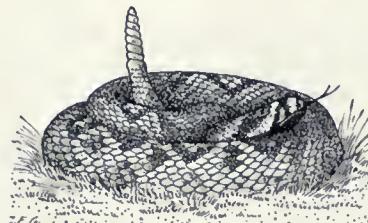
At the Annual Meeting of the Board of Trustees of Field Museum, held January 19, Mr. Albert B. Dick, Jr., was elected Third Vice-President, filling the vacancy caused by the recent resignation of Mr. Albert W. Harris. Mr. Dick has been a member of the Board since December 21, 1936.

Mr. Stanley Field was re-elected President, and in 1942 will serve his thirty-fourth consecutive year in that office. Other officers who served in 1941 were re-elected. They are: Colonel Albert A. Sprague, First-President; Mr. Silas H. Strawn, Second Vice-President; Major Clifford C. Gregg, Director and Secretary, and Mr. Solomon A. Smith, Treasurer and Assistant Secretary.

"Scepter of Good Luck"

In all times, and among all peoples, superstition has endowed various objects as harbingers of good luck. While its power to bring felicity is doubted, a beautiful example of such an object is the Chinese scepter of good luck, carved from sandalwood, on exhibition in Stanley Field Hall, Case 12.

KNOW YOUR SNAKES EVEN IF YOU SHUN THEM



A conspicuous gap in Putnam's famous series of pocket nature guides is closed with publication of *The Field Book of Snakes of the United States and Canada*, by Karl P. Schmidt and D. Dwight Davis, Chief Curator and Curator of Anatomy respectively at Field Museum. "Few handbooks are written with such care and thoroughness, and few are so profusely illustrated," says Clifford H. Pope, Curator of Reptiles. "It has already taken its place as a standard work, indispensable to scientists, amateurs, and laymen interested in snakes."

On sale at THE BOOK SHOP of FIELD MUSEUM—\$3.50. Mail orders accepted.

Field Museum of Natural History

FOUNDED BY MARSHALL FIELD, 1893
Roosevelt Road and Field Driv, Chicago
TELEPHONE: WABASH 9410

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

NEW PLANT FOR GARDEN USE DISCOVERED BY EXPEDITION

BY JULIAN A. STEYERMARK

ASSISTANT CURATOR OF THE HERBARIUM

While conducting the Field Museum Expedition to Guatemala in 1939-40, the writer visited some densely forested jungles in the hills across the bay from Puerto Barrios, the country's Atlantic port of entry. The hills in this area are covered by a heavy rain forest composed of many species of trees, shrubs, and lianas. Orchids, bromeliads, aroids, and many mosses and hepaticas bedeck the branches and vines. Numerous mountain streams run rapidly down the slopes, everywhere hemmed in by dense vegetation. Many species of palm trees, and some mahogany and chicle comprise part of the forest cover.

In the shade of this forest occur numerous shrubs of the madder, melastome, and pepper families. On the floor of the forest are low species of palms, intermingled with various herbaceous plants. While collecting this flora, I observed a plant with lily-like leaves scattered over the forested slopes. Digging away the surface of the soil, a large bulb was discovered. Although no flowers were obtainable, a specimen was collected for the Museum's Herbarium, as well as several bulbs for Chicago's Garfield Park Conservatory.

FLOWERS DEVELOPED AT CONSERVATORY

At Garfield Park the plants soon developed a magnificent cluster of leaves. For a year and a half these leaves grew satisfactorily,

but no blossoms appeared. Meanwhile, study of dried specimens revealed that the plant was probably a species new to science, although this could not be certain until a careful study of the flowers had been made. Finally, on November 5, flowers appeared on one of the plants, and an examination of these showed the plant to be a member of the group commonly known in the United States as spider-lilies (*Hymenocallis* or *Pancratium*).

Several more flowers appeared at the top of a thick stalk more than two feet high. The large flowers are very showy and delicately fragrant. They are white with recurved curly perianth segments and measure one foot in total length. Comparison of the plant with known species of its kind showed it to be undescribed, and a technical description was therefore prepared for publication. Garfield Park Conservatory thus has the unique distinction of having the only plants of this species in cultivation, so far as is known.

The plant is of interest not only because it represents an additional species of spider-lily, but also because it is worthy of introduction into conservatories and gardens. It is one of the showiest and stateliest members of the group yet discovered, with white flowers as bright as those of the Easter lily.

ARTIFICIAL POLLINATION ATTEMPTED

Steps have already been taken to pollinate the flowers artificially, and it is hoped that seeds may eventually be produced. One of the bulbs has produced an offshoot, and, no doubt, the future will witness successful propagation of this species. From just such small beginnings other plants, now well established as garden favorites, have come into cultivation. The famous Kew Gardens in England have, since their beginning, cultivated and propagated plants which were sent in as seeds or roots. Many such plants are now among producers of the best-loved flowers known to man. It is stimulating to realize that to this day, and even in the future, many new plants still may be brought into cultivation for man's pleasure.

4 LATIN-AMERICAN EXPEDITIONS REPORT ON PROGRESS

Four of the five expeditions which Field Museum currently has in operation in Latin-American countries have recently sent reports on the progress of their work to Major Clifford C. Gregg, Director.

Mr. Paul O. McGrew, Assistant Curator of Paleontology, who is leader of an expedition in Honduras, reports that he has excavated a specimen of a large and rare dog which lived some 7,000,000 years ago and is similar to a rare type of about the same period that inhabited the North American plains. He has found also a dwarfed type of Pliocene horse which resembles prehistoric North American horses in all characters except size. Its stunted growth may have

been due to the unfavorable habitat afforded by the tropics. He states that the dog is a species almost "certainly new to science, and of great importance." He also writes: "I am amazed and pleased at the high opinion in this country of anything pertaining to *Los Estados Unidos*."

Mr. Colin Campbell Sanborn, Curator of Mammals, who is conducting a zoological expedition in Peru, reports that he has collected a large number of animals for the Museum. He is engaged in visiting localities of special zoological interest, especially in the valleys of some of the more remote tributaries of the Amazon.

From Cuenca, Ecuador, Mr. Donald Collier, Assistant Curator of South American Ethnology and Archaeology, sends a preliminary report about explorations on mule-back in little known regions, and archaeological excavations on sites once the seats of prehistoric Indian communities. The Museum shares in this expedition with the Institute of Andean Research, of New York.

Dr. Julian A. Steyermark, Assistant Curator of the Herbarium, who is in charge of an expedition in Guatemala, reports that he has been so busy collecting thousands of plant specimens that Christmas had passed by two days before he realized its arrival. He is working in difficult mountain regions, living largely with native Indians, and enjoying the meat of coatis, wild turkeys, and opossum.

The Museum's fifth Latin-American explorer is Mr. Llewelyn Williams, Curator of Economic Botany, who is making a botanical survey in Venezuela.

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.

RESEARCH COLLECTION PREPARED FOR STUDENTS OF PREHISTORY

The development of man and his cultures during the past 250,000 years is shown by means of eight dioramas and twenty-three cases in the Hall of the Stone Age of the Old World (Hall C).

In addition to more than a million visitors annually, students from the University of Chicago, Northwestern University, University of Illinois, and Notre Dame University regularly use this hall in pursuit of studies prescribed for certain courses in their curricula.

After twelve years the study collection pertaining to the same subjects as the hall is now catalogued and arranged for the use of students. Several representative series have been sent to other institutions. The Department of Anthropology at the University of Chicago has received by exchange an especially selected series of stone and bone tools. As a direct result of war conditions in Europe, the selected objects on exhibition and the large series of specimens in the study collection have acquired a more marked significance and a greatly augmented cultural value.

In order to obtain representative examples of stone and bone tools, prehistoric human remains (originals and casts), and animal bones of each period and sub-period, it was necessary for Field Museum to dispatch several expeditions. Specimens were obtained in England, Scotland, France, Belgium, Holland, Germany, Denmark, Czechoslovakia, Austria, Hungary, Switzerland, Italy, Spain, Syria, Palestine, Trans-Jordan, Iraq, Iran, and the U.S.S.R.

With the assistance of the Abbé Henri Breuil, Professor at the Collège de France and Corresponding Member of Field Museum, the majority of the 75,000 specimens were purchased in France. Several small excavations in England and France were sponsored by the Museum in order to obtain specimens from special areas or sub-periods. Representative series of cultural periods in Africa, India, Mongolia and China were obtained by gift, purchase, or exchange. The Museum already possessed a nucleus of several important collections of prehistoric objects presented to the institution at the conclusion of the World's Columbian Exposition in 1893.

—H.F.

The light of Egypt is represented by an exhibit of pottery lamps and jars from the Roman period (second to fourth century A.D.) in Hall J. Most have single burners, but one with two and one with eight burners are also shown.

Facts about the geological history of the Chicago region are demonstrated by a series of relief maps, and various other physical geology exhibits in Clarence Buckingham Hall (Hall 35).

A VISIT WITH CAVE MAN ON FEBRUARY SUNDAY LECTURES

A personal introduction to, and an intimate visit with various races of prehistoric man, are offered on Sunday afternoons during February by Mr. Paul G. Dallwig, the Layman Lecturer. Mr. Dallwig will drama-

and various sculptured objects which have survived through the ages.

Because of heavy public demands, it is necessary to limit each audience to 100 adults (children cannot be accommodated).



"MR. AND MRS. 1942—MEET THE CHELLEAN BROTHERS OF 250,000 B.C."

Some of the prehistoric men to whom Layman Lecturer Paul G. Dallwig will introduce his audiences.

tize typical incidents in the lives of prehistoric human beings from about a quarter of a million years ago down to the dawn of recorded history, at the same time conducting his audience through the Hall of the Stone Age of the Old World where they may study the life-size dioramas of the various peoples under discussion. Mr. Dallwig devotes special attention to various phases of prehistoric art as represented by paintings and carvings on ancient cave walls,

Those desiring to attend must make reservations in advance by mail or telephone (WABash 9410). The Sunday lectures begin promptly at 2 P.M. and end at 4:30. Midway there is an intermission for refreshments and smoking in the cafeteria.

In March Mr. Dallwig's subject will be "The Parade of the Races," illustrated by Malvina Hoffman's comprehensive Races of Mankind sculptures in Chauncey Keep Memorial Hall.

WEEKDAY LECTURE TOURS OFFERED IN FEBRUARY

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 2: Monday—Designs in Wood (Miss Marie B. Pabst); Tuesday—General Tour (Miss Elizabeth Hambleton); Wednesday—People of the South Seas and East Indies (Miss Elizabeth Hambleton); Thursday—General Tour (Miss Elizabeth Best); Friday—Food Plants Native to America (Mrs. Leota G. Thomas).

Week beginning February 9: Monday—Animals Throughout the World (Miss Elizabeth Best); Tuesday—General Tour (Miss Elizabeth Hambleton); Wednesday—The Geology of Our National Parks (Bert E. Grove); Thursday—General Tour (Mrs. Leota G. Thomas); Friday—Plants of Pacific Lands (Miss Marie B. Pabst).

Week beginning February 16: Monday—Animals of Land and Sea (Miss Elizabeth Best); Tuesday—General Tour (Miss Elizabeth Hambleton); Wednesday—The Importance of Rocks and Minerals (Bert E. Grove); Thursday—General Tour (Miss Marie B. Pabst); Friday—The Near East, Cradle of Civilization (Miss Elizabeth Hambleton).

Week beginning February 23: Monday—Animals Large and Small (Miss Elizabeth Best); Tuesday—General Tour (Miss Elizabeth Hambleton); Wednesday—The History and Adventure of Life (Bert E. Grove); Thursday—General Tour (Miss Elizabeth Best); Friday—Native Life of the Philippines (Mrs. Leota G. Thomas).

Persons wishing to participate should apply at North Entrance. Tours are free.

Horned and hooved mammals—game animals from all parts of the world—are exhibited in George M. Pullman Hall.

FAR EASTERN WAR ZONES IN MUSEUM LECTURE

Singapore—Malaya—Java—the Philippines—Hawaii—Guam—Hongkong—Shanghai—and Japan—the vital spots figuring in today's, yesterday's, and tomorrow's news, all will be shown in colored motion pictures accompanying the lecture "Circle of Fire" to be presented at Field Museum on Saturday afternoon, March 7. This lecture opens the institution's annual spring course for adults.

Thenceforth, throughout March and April, lectures will be given each Saturday afternoon, at 2:30 o'clock, in the James Simpson Theatre of the Museum. Engaged for the series are outstanding scientists, explorers, and naturalists. Topics of the day will figure in some of the talks, while others will afford total relief from current turmoil by their restriction to the things in nature and science not related to the war. All of the lectures will be illustrated with motion pictures or stereopticon slides, many in natural colors.

Speaker for the opening lecture on the outposts of the Pacific is Mr. Francis Raymond Line, of Ontario, California, who, after graduating from the University of Michigan with Phi Beta Kappa honors, has devoted his time to studies of all phases of life in the Far East, traveling 25,000 miles by clipper plane, automobile, horse, and ship to virtually every "hot spot" in the Pacific area. His motion pictures made inside Japan are the last of professional caliber to come out of that country. In all of the places he visited—Dutch East Indies, possessions and territory of the United States, Straits Settlements, Malay Archipelago and Peninsula, and Asiatic mainland, Mr. Line's films show not only the life of the peoples seething restlessly in this circle, but the natural features such as spectacular volcanoes, the luxuriant jungles, and the prolific wild animal life.

The March issue of FIELD MUSEUM NEWS will contain a complete schedule of all eight 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.

GIFTS TO THE MUSEUM

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

Department of Anthropology:

From Colonel Wallis Huidekoper, Twodot, Mont.—26 specimens of ethnological material from Sioux, Crow, Arapaho, and Cheyenne

Indians, northern plains of the United States; from Wesley R. Hurt, Jr., Albuquerque, N. M.—2 Navaho pottery bowls, Arizona.

Department of Botany:

From Professor Bernardo Rosengurtt, Montevideo, Uruguay—15 herbarium specimens, Uruguay; from Richard A. Schneider, Kankakee, Ill.—16 herbarium specimens, Illinois; from Harry Hoogstraal, Urbana, Ill.—982 herbarium specimens, Mexico; from Dr. E. S. Deevey, Houston, Tex.—40 specimens of algae, Mexico and Texas; from Donald Richards, Chicago—125 specimens of mosses, North America; from University of Chicago, Chicago—7,285 specimens of fungi; from Weyerhauser Timber Company, Longview, Wash.—trunk, wheel section, and a plank of Sitka spruce, Washington; from Howard Scott Gentry, Ann Arbor, Mich.—29 herbarium specimens, Mexico; from Paul H. Allen, Balboa, Canal Zone—47 herbarium specimens, Panama.

Department of Geology:

From Claron Hogle, Duluth, Minn.—a specimen of thomsonite, Lake Superior region.

Department of Zoology:

From Dr. Charles H. Seevers, Chicago—154 histerid beetles, 14 scorpion flies, and a Hemerobiid, Mexico, Indiana, Illinois, and Tennessee; from William J. Gerhard, Chicago—51 beetles and allies, Indiana, Pennsylvania, Maryland, New Jersey, and Illinois; from Chicago Zoological Society, Brookfield, Ill.—32 birds, a waterbuck, an orang, and 2 eggs of African wood ibis; from Donald M. Smith, Chicago—205 insects, northwestern United States; from Boardman Conover, Chicago—5 quail, 3 wood rails, and one Hawaiian honey-creeper, Paraguay, Hawaii, and Virgin Islands; from Professor Angel Maldonado, Lima, Peru—80 specimens comprising 2 species of shrimps and freshwater snails, western Peru; from Leslie Hubricht, St. Louis, Mo.—4 salamanders, Missouri; from Karl F. Kauffeld, Staten Island, N. Y.—2 rattlesnakes, New York and New Jersey; from Museum of Vertebrate Zoology, University of California, Berkeley, Calif.—5 kangaroo rats, Nevada.

The Library:

Valuable books from Dr. Henry Field, Washington, D.C.

Staff Notes

Mr. Loren P. Woods, Assistant Curator of Fishes, lectured at Earlham College, Richmond, Indiana, January 15, on the accomplishments of last year's Leon Mandel Expedition to Galapagos for Field Museum.

Dr. C. Martin Wilbur, Curator of Chinese Archaeology and Ethnology, read a paper on "Industrial Slavery in the Han Period, China" before a session of the American Historical Association which held its annual meeting in Chicago recently.

NEW MEMBERS

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

Associate Members

George D. Cherones, Joseph Y. Grade, Albert Maling.

Non-Resident Associate Members

Harry G. Dalzell

Annual Members

Mrs. M. S. Anzel, Kenneth Aranoff, Zedrick T. Braden, Miss Sophia C. Camenisch, Don L. Davis, Robert T. Drake, Walter H. Gabel, Chester G. Gifford, Louis G. Glick, Watson D. Harbaugh, Samuel J. Hirschberg, Mrs. David E. Hokin, Dr. J. A. Kerr, W. K. Kruse, Miss Frances Lasker, Walter A. Mack, Julian Mero, George W. Murison, Marshall E. Neuberg, James J. O'Connor, Price A. Patton, Edward Vilas Platt, Walter J. Preston, Griswold A. Price, Owen Vinson.

A Counterfeit That Became Better Than Real Money

As relative values change with time, counterfeits and fraudulent imitations once profitable may become the reverse. An example is the counterfeit of a Spanish gold coin shown in H. N. Higinbotham (Hall 31). It was made by gilding platinum, a metal now more valuable than gold.

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.

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WHY WORRY ABOUT SUGAR? PEOPLE LIVED WITHOUT ANY FOR CENTURIES

BY PAUL C. STANLEY
CURATOR OF THE HERRARIUM

From the national concern about a sugar shortage that daily occupies so much space in the newspapers one would suppose that man could not exist without sugar! Perhaps this is almost true nowadays, for last year the people of the United States each consumed about 96 pounds of cane and beet sugar, and food habits are hard indeed to change.

But it was not always so, and even today sugar is not regarded as so important in all countries as it is in ours. As recently as forty years ago the Russians used no more than two pounds per capita annually; and for thousands of years highly civilized peoples of Europe and the Near East managed to live healthfully and happily, if we may judge by their literature, without any such sugar at all.

It is difficult to comprehend the radical changes that

have taken place in the diet of civilized man during only the past few hundred years. In Shakespeare's day the English existed almost wholly upon meat and bread. Sugar was unknown to the ancient Greeks and Romans, except the few legionnaires who in their campaigns had traveled to the extreme Orient. The fabulous Lucullan banquets of Rome's epicures were graced by no sugar except that obtained in honey, and in dates and other fruits.

Cane sugar actually was introduced into England about 1466, but was long restricted to occasional feasts of the rich, or to use as a medicine! It did not come into common use in that country until about 1580, when importations began from Brazil by way of Portugal. Naturally enough, once obtain-

able, it increased rapidly in popularity; and by 1790 the English consumption was 20 pounds annually per person. In quite recent years its use has taken a sharp upturn. In Australia, New Zealand, Denmark, and the United States about 100 pounds per person have been consumed each year, and

most tropical and subtropical regions, and in almost unlimited amounts in the Latin-American countries. That it has not been exported in larger amounts recently from South and Central America has been due to low prices and especially to competition with countries having preferential tariffs or sugar quotas. It is a crop that yields heavily and quickly. It requires much less labor than many other field crops.

In 1940 this country used about 5,712,000 tons of sugar. Of this huge quantity it obtained about one-third from cane or beets grown within the continental United States. Most of another third was imported from Cuba, and the greater part of the remaining third came from the Philippines, Hawaii, and Puerto Rico. Of these formerly dependable sources of supply, the one-sixth furnished by the Philippines is now definitely out of reach, and the approximately one-sixth furnished by Hawaii is likely to be

curtailed by lack of transportation. It would seem reasonable that much of this shortage could be compensated by increased cultivation in Louisiana, Florida, Cuba, and Puerto Rico, and by importation from Brazil and other Latin-American countries. They doubtless would be glad to sacrifice part of their own sugar consumption to increase trade balances, if their product were permitted entry to the United States on equitable terms.

CANE AND BEET SUGAR INDISTINGUISHABLE

Much of the sugar used in the United States and Europe is obtained from sugar beets, whose sugar is indistinguishable from that of cane except by complicated laboratory tests. There is no difference whatever in chemical composition, taste, solubility in



COLONIAL SUGAR PLANTATION IN BRAZIL

A mural painting by Julius Moessel, in the Museum's Hall of Food Plants (Hall 25)

in some other European countries almost as much was eaten (prior to the war).

Sugar cane is believed to be or to have been native in southeastern Asia and must have been utilized there from man's earliest days of existence, but it was not for hundreds of years after the beginning of the Christian era that it or its product (first called "sweet salt") became well known in China and northeastern Africa. It was taken to Spain by the Arabs about A.D. 700, and for a long time was grown along the Mediterranean coast. About 1420 it was introduced into Madeira by the Portuguese, later into the Canaries, thence to Santo Domingo, and to Brazil early in the 16th century. It is said to have reached Mexico in 1553.

Cane sugar can be produced in all or

coffee or tea, or ultimate result in products cooked with either of these two kinds of sugar, despite the firm conviction to the contrary held by millions of housewives and professional cooks. Beet sugar is of comparatively recent development, the industry dating back only to 1820.

As a food, sugar is really pretty much of a luxury, as evidenced by man's long successful existence without it. However, in our country and time it has been plentiful and not expensive, and the liking for sweet foods has become a well fixed habit. The absence of sweets certainly makes the diet more monotonous, as one may prove during a visit to any of the Latin-American countries, whose desserts are much less lavish than those of the United States. North American Indians learned to use the sweet sap and sugar of the sugar maple, which although very popular still are obtainable only in limited amounts. Other American aborigines made use of the sweet sap of the maize plant. The modern corn sirup, a very different article, is an important by-product in the manufacture of starch and other maize derivatives.

Another sirup popular in some parts of the south and southwest is that of sorghum, a giant grass well known in those regions and grown as feed for stock and poultry. If an acute sugar shortage should develop in the United States as a result of war conditions, those least affected would be the hill people of the south who still use in their coffee "long sweetnin'," their term for molasses and sirup.

SUGAR EXHIBITS AT MUSEUM

In the Hall of Food Plants (Hall 25) at Field Museum, various forms of sugar from the native markets of many countries are shown. There are also detailed exhibits representing the steps in the manufacture of cane and beet sugar. Included in the series of large mural paintings in this hall, the work of Julius Moessel, well-known Chicago artist, is a painting showing the gathering of sugar cane on a Brazilian plantation back in the days when Negro slaves were used for this work.

FACES OF ALL PEOPLES

In these days of racial confusion it is well to pause and reflect on the racial composition of mankind. Anthropologists have divided the two billion inhabitants of the world into groups on the basis of physical differences. A visual presentation of the result, as determined by the late Dr. Viktor Lebzelter, of the Museum für Völkerkunde in pre-war Vienna, forms a special exhibit in Case 6 in Chauncey Keay Memorial Hall (the Hall of the Races of Mankind—Hall 3). Here may be studied the facial expressions of the various peoples of the world.

The suggested relationship between the most important racial groups has been indicated by colored lines. While physical

anthropologists would undoubtedly disagree upon some features of this diagrammatic presentation of the most complex of all anthropological problems, the general trends can be accepted. For example, in the Old World the Negro blood is, in general, concentrated in a band extending from the west coast of Africa eastward through southern India into Melanesia.

The photographs were selected from about 200,000 prints in museums or in the files of photographic services both in the United States and in Europe. The visitor who stands before this exhibit cannot fail to visualize the differences between racial groups, and at the same time he will appreciate the true unity of mankind. —H.F.

CLOTHING OF FAMOUS INDIANS

BY PAUL S. MARTIN
CHIEF CURATOR, DEPARTMENT OF ANTHROPOLOGY

Two handsome examples of Plains Indian clothing, part of a larger collection of Indian specimens, have recently been presented to Field Museum by Colonel Wallis Huidekoper of Two Dot, Montana, and are being prepared for exhibition in Mary D. Sturges Hall (Hall 5). One of these is a dress of buckskin, made by the Dakota tribe; deeply fringed, it is distinguished by a massive yoke of beads in blue, red, yellow, and other colors. Beads also adorn the skirt, and examination indicates that these were of later manufacture than the beads composing the yoke. Thus it may be concluded that the skirt of the dress had worn out first, so that a new skirt was sewn to the original yoke.

This dress was once worn by the wife of Red Cloud, a famous chief. She is believed to have been his only wife, although many Dakota men married more than once. Red Cloud's position was not hereditary, but was rather attained by virtue of his wisdom and his courage as a warrior. He was born near the Platte River of Nebraska, about 1822. During his lifetime the hunting territory of the Dakota was encroached upon increasingly by the westward movement of white settlers. The buffalo herds, chief food source of the Plains Indians, threatened to become greatly reduced in number, and for this reason bloody encounters took place in 1866 and 1867 between Dakota warriors and detachments of the United States Army. Red Cloud was a leader in these battles, and in 1868 he signed on behalf of his tribe a treaty guaranteeing that the United States government would withdraw garrisons from three important military posts within Dakota territory. Red Cloud apparently took no further part in hostilities against the white men. He died in 1909 on the Dakota reservation at Pine Ridge, South Dakota.

The second garment, which is shortly to go on display, is a buckskin shirt that Colonel Huidekoper obtained directly from Plenty Coups, a chieftain of the Mountain

Crow. Like the Dakota dress it is fringed and beaded, but is further trimmed with ermine tails and strands of human hair. Its original owner, Plenty Coups, was born in 1848, not far from the present town of Billings, Montana. He came into prominence during that difficult time when the Indians could no longer live by hunting, and had no alternative to living on the reservations. Plenty Coups was a leader of the Crow during this trying period, and often served as their representative in dealings with the government.

After the first World War, at the ceremonies for the Unknown Soldier at Arlington, he represented the Indians of the United States and in their behalf laid a wreath on the tomb. In the last war, although Indians were not subject to the draft, more than 8,000 entered military service. Many of them received citations for bravery. Today, more than 4,000 Indians are already in the Army, including Brigadier-General Clarence L. Tinker, commander of the Army air forces in Hawaii.

In a world currently in turmoil, it is of more than passing interest to study relics of past civilizations such as those of Babylonia, Egypt, and ancient Rome. The halls at Field Museum devoted to exhibits of antiquities offer great opportunities to persons with a reflective turn of mind.

FIELD MUSEUM HONOR ROLL

Now in the Service

of their Country:

- Theodore Roosevelt, Trustee—Brigadier-General, U.S. Army.
- Lester Armour, Trustee—Lieutenant Commander, U.S. Navy.
- Joseph Nash Field, Trustee—Lieutenant, J. G., U.S. Navy.
- Clifford C. Gregg, Director—Major, U.S. Army.
- Melvin A. Traylor, Jr., Associate, Birds—Private, U.S. Marine Corps.
- Dr. John Rinaldo, Associate, Southwestern Archaeology—Private, U.S. Army.
- Dr. Alexander Spoehr, Assistant Curator, North American Ethnology and Archaeology—Private, U.S. Army.
- Bert E. Grove, Guide-Lecturer—American Field Service, in North Africa.
- Patrick T. McEnery, Guard—Master-at-arms, U.S. Navy.
- John Syckowski, Guard—Chief Commissary Steward, U.S. Navy.
- George Jahrand, Guard—Chief Water Tender, U.S. Navy.
- M. C. Darnall, Jr., Guard—Candidates' Class, U.S. Marine Corps Reserve (Officers' Training Course).
- James C. McIntyre, Guard—Private, U.S. Army, Coast Artillery.
- Clyde James Nash, Guard—Chief Gunner's Mate, U.S. Navy.

ECUADOR EXPEDITION RETURNS

Mr. Donald Collier, Assistant Curator of South American Archaeology and Ethnology, has recently returned from five months of archaeological exploration and excavation in Ecuador. The expedition was a co-operative venture of the Institute of Andean Research (of New York), Field Museum, and the University of Chicago. Mr. Collier was accompanied by Mr. John V. Murra, from the University of Chicago, and an Ecuadorean student who joined the expedition through the co-operation of the Ecuadorean government. The party explored a two hundred mile stretch of the archaeologically unknown mountainous region of southern Ecuador, and dug in a number of important ruins dating from before the occupation of Ecuador by the Incas in the fifteenth century. As a result of the information and archaeological material collected, it is possible to confirm the already suspected important relationships between the early cultures of Ecuador and those of northern Peru. The expedition was fortunate in uncovering a deep refuse deposit in which one type of culture overlay an earlier type. Only one other authentic case of cultural stratification has so far been found in Ecuador.

A good part of the very rugged country traversed was covered on mule back. Mules are preferable to horses in the Andes because they have more endurance, particularly in high altitudes, and are more sure-footed—important qualities when one misstep would plunge the rider over a thousand-foot cliff or into a foaming mountain torrent. Travel was particularly difficult in the province of Loja, which was cut off from the outside world because of Ecuador's border conflict with Peru. As a result, mules and food were very scarce, and the expedition went without its supper on more than one occasion.

"GHOST GUARDS BURIED TREASURE"

One site excavated at a place called Narrio consisted of a large hill containing burials, remnants of houses, and debris left by the Indians who lived there a thousand years ago. A considerable number of gold ornaments have been found in graves in this vicinity, and there are many local beliefs and legends about Inca treasure. The Narrio Indians believe that a ghost, said to be the spirit of a dead king, haunts the hill and guards the treasure buried there. Several of the expedition's Indian workers claimed to have seen the ghost on their way home at dusk, but he failed to reveal himself to the American archaeologists. Because of the zeal of the local treasure hunters, it was necessary to guard the excavations with two Indians armed with large and murderous-looking machetes.

The Indians living in this country in prehistoric times were called the Canaris. When the Incas invaded Ecuador in the middle of the fifteenth century, the Canaris

put up a determined fight but were finally conquered by the superior army of the invaders. In accordance with their usual practice of absorbing conquered territory into their empire, the Incas removed 15,000 Canaris to Bolivia and southern Peru, and replaced them with loyal Inca subjects. This incident offers a strange parallel to conquest practices of Hitler Germany.

The expedition collected a large number of potsherds, pottery vessels, and tools and ornaments of bone, stone, shell, and metal. This collection is being shipped to Field Museum for study.

THINGS YOU MAY HAVE MISSED

Magicians' Staffs With "Powers" Derived from Slain Captives

Magicians' staffs, regarded by certain wild tribesmen of Sumatra as possessing miraculous powers, are exhibited in the Dutch East Indies ethnological collections



SUMATRAN MAGICAL WANDS
Their victims become "slaves after death"

of Field Museum (Hall G, Case 6). According to the data obtained by the Museum's Department of Anthropology, the following is the formula prescribed by the priests of the Toba Batak tribes of north central Sumatra for making such magic wands:

Capture a member of an enemy tribe, or select a captive from among those in the compound. Bury him in the sand up to his neck, and keep him there for a protracted period, starving and torturing him all the while. At last, after the most horrible cruelties to which you can submit him without killing him, he will in desperation agree to do your bidding. As soon as he has made this promise, kill him and feed his brains to the carved figures on the pole which you have chosen to be your magician's wand.

Thereupon, in the belief of the Toba Batak practitioners of magic, the victim's spirit will be transferred to the staff, he will thus have been brought under complete control of the magician, and he may be forced to perform such deeds upon others as may be demanded.

HIS RESEARCH PUBLISHED, CURATOR ENTERS ARMY

Just before Dr. Alexander Spoehr, Assistant Curator of North American Ethnology and Archaeology at Field Museum answered his call to service with the United States Army (he was inducted on February 21), Field Museum Press published his book, *Kinship System of the Seminole*, which no doubt will be his last research publication for the duration of the war.

The book contains the results of his studies while living among the Seminole Indians of Oklahoma during a period of five months, on a research project sponsored by the Department of Anthropology of the University of Chicago. The Seminoles are one of five Indian tribes whose members were moved bodily from the southeast to Indian Territory (now part of Oklahoma), and given status as independent nations under treaties with the United States which continued in force until 1903. They have a matrilineal form of descent governing family relationships and inheritance of property, and many strange customs which are revealed in Dr. Spoehr's book.

One of these customs was the existence of "joking relationships" which prevailed between *cahacawa*, a Seminole term designating all of the following: the wife of a man's brother, the wife of his sister's son, the wife of his mother's brother, and the sisters of his own wife—the man himself was likewise *cahacawa* to all these women. Between people bearing this relationship to each other an absolute maximum of joking, teasing and familiarity was encouraged; between other relatives a most serious mien was usually maintained.

British Ambassador Visits Museum

Viscount Halifax, British Ambassador to the United States, and Lady Halifax were visitors at Field Museum on February 11, and made a tour of some of the more important exhibits, escorted by Mr. Stanley Field, President of the institution.

SATURDAY AFTERNOON LECTURES FOR ADULTS BEGIN MARCH 7; SOME ON PACIFIC WAR AREA

Eight lectures, illustrated with motion pictures and slides, will be presented in the spring course of Field Museum on Saturday afternoons throughout March and April. Outstanding scientists, explorers, and naturalists have been engaged for the series, which will be notable especially for several lectures dealing with regions very much in the current news of the day—the Philippines and other islands of the Pacific, China, and



HUMAN AND ANIMAL SKULL TROPHIES, PHILIPPINE ISLANDS

Captain John D. Craig's Lecture, April 18

Latin America. Most of the pictures accompanying the lectures will be in colors.

The lectures are to be given in the James Simpson Theatre of the Museum, and each will begin at 2:30 P.M. The Theatre entrance will be open at 2 o'clock each Saturday. 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 7—CIRCLE OF FIRE.

Francis R. Line.

This lecture, and the accompanying colored motion pictures, aim to present a survey indicating the significance of the whole vast Pacific area. Mr. Line's film includes what are probably the last professional colored motion pictures to be brought out of Japan. He shows also "close-ups" of life in Shanghai, Hong Kong, Singapore, Java, the Philippines, Guam, and Hawaii. To produce his film and gather the data for his lecture, Mr. Line spent months in the Orient and traveled 25,000 miles by Clipper plane, automobile, on horseback, and by ship. The natural features of the countries covered, as well as the life of the peoples, are portrayed in the motion picture, with

striking views of awesome volcanoes, and a rich panorama of the plant and animal life thronging the luxuriant jungles.

March 14—COLOR IN THE SOUTHWEST.

Alfred M. Bailey.

Mr. Bailey, a former member of Field Museum's zoological staff, and now Director of the Colorado Museum of Natural History in Denver, has made some of the finest colored pictures ever to come out of the Southwest. The films he will show include air views of the great Meteorite Crater of Arizona, and land shots of the vast desert in that state, in bloom with its many curious types of flowers. There are also many interesting views of the life of the birds and reptiles which inhabit this region.

March 21—LIVING WITH THE CHINESE.

Karl Robinson.

A most active and far reaching avenue of international trade is the oil business, and for nearly a decade Mr. Robinson lived and traveled in Asia

in the interests of "oil for the lamps of China." This brought him into intimate contact with the Chinese, and gave him an exceptional insight into the lives of a people living close to "the good earth." In this ancient country he has found a phase of Chinese life the Japanese can neither dominate nor destroy—China's great agrarian civilization. Mr. Robinson's lecture and the slides illustrating it comprise a personal narrative of living with the Chinese, together with the story of the Chinese peasant, his character and his philosophy.

March 28—AMERICA'S FIRST INSECT ZOO.

Brayton Eddy.

As Director of the Insect Zoo at Goddard Park in Rhode Island, and later of the Insect Zoo at Detroit, Mr. Eddy has had unprecedented opportunities for taking motion pictures of both insects and insect eaters. His films of butterflies emerging from their cases, doodle bugs

trapping their prey, and hornets building paper nests and feeding their young, have attracted widespread attention and acclaim from both scientists and laymen.

April 4—SCIENTIFIC DIVERSIONS IN PLANT LIFE.

Arthur Pillsbury.

Mr. Pillsbury is noted for making some of the most unique investigations of plant life ever attempted. He will demonstrate his findings by means of unusual motion pictures in full color. His films show in a few minutes, by means of "time lapse" photography (a specialized form of "slow motion technique"), what takes place during several months' growth and development of plants. Included also are fascinating studies of plants made with microscopic cameras, and the results of many other remarkable experiments in fields in which Mr. Pillsbury has pioneered.

April 11—PERU TODAY.

William B. Holmes.

William Blodgett Holmes' latest photographic adventure has carried him through the mountains and jungles of Peru. The result is a spectacular documentary study in natural color motion pictures. There are scenes on beautiful Lake Titicaca, the loftiest navigable lake in the world, where the balsa reed boats appear as golden skiffs in the rising sun. Likewise shown are colorful vistas among Peru's mountains, some of which reach altitudes of more than 19,000 feet. Mr. Holmes also pictures the



A FILIPINO FAMILY AND THEIR HOME

Captain John D. Craig's Lecture, April 18

vestiges of the ancient glorious civilization when Peru was the land of the Incas. He shows the deserted city of Machu Picchu, city of a thousand stairs; the jungles in the Amazon basin region where native tribes

still hunt and fish with bows and arrows; the old Inca trail that leads through the heart of the country; and modern industrial Peru of today, rich in resources—coffee, copper, oil.

April 18—THE PHILIPPINES.

Captain John D. Craig.

Captain Craig, one of the outstanding personalities among present-day lecturers, obtained much of the data for this illuminating lecture about our currently endangered Pacific outposts directly from General Douglas MacArthur, hero of Bataan. He also interviewed High Commissioner Sayre, President Quezon of the Philippines, and a host of other people who have lived in the islands for years. Not only has Captain Craig filmed the color and life of the accessible areas—he has also studied and photographed many unknown sections, some of them still marked "unexplored" on the newest maps.

April 25—ADVENTURES WITH BIRDS.

Martin Bovey.

Mr. Bovey, noted for his film studies of wild life in America, will show, in conjunction with this lecture, films made in and around Concord, Massachusetts. Included are studies in color of such nesting birds as crested flycatcher, tree swallow, red-eyed vireo, indigo bunting, chestnut-sided warbler, piping plover, etc. The rest of the film deals largely with waterfowl, notably ducks and geese in Louisiana and elsewhere. There are intimate revelations of the life of pelicans, pied-billed grebes, Florida gallinules, and egrets.

MUSEUM LIBRARY CO-OPERATES IN VICTORY BOOK DRIVE

The Library of Field Museum has been designated as one of the centers for the collecting of books in the Victory Book Campaign. The personnel of the Museum has begun contributions of books for men in the armed services of the United States through this medium, and the Library's facilities for this purpose are now extended to the several thousand Members of the Museum as well. Some Members may desire to make their contributions of books through the Museum Library, especially because of the commodious parking arrangements at this institution which would facilitate delivery of bundles of books brought in automobiles. Others may find it more convenient to deliver their gifts to the main building of the Chicago Public Library down-town (to which contributions received at the Museum are forwarded) or to the branches of that institution in various parts of the city.

The campaign is sponsored by the United Service Organizations, the American Red Cross, and the American Library Associa-

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 reservations will then be



CHUNCHU JUNGLE INDIANS, PERU
William B. Holmes' Lecture, April 21

held in the Member's name until 2:30 o'clock on the day of the lecture specified. All reserved seats which have not been claimed by 2:30 P.M. will be made available to the general public.

tion. One million books has been set as the quota expected from the Chicago area. These, with the contributions from other parts of the country, will be systematically divided so as to give each fort, camp, post, ship, and recreation center for soldiers, sailors, and marines a diversified selection of reading matter. Librarians on the Museum staff will assist those of the Public Library and other institutions in the huge task of sorting the books. The classes of books especially requested are those on travel, current affairs, history, psychology, fiction (particularly of the mystery, western and adventure varieties), copies of the classics, technical books, and works on photography and other hobbies. The books should be in good condition; no magazines are desired.

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 7 (Labor Day).

FREE PROGRAMS FOR CHILDREN IN MARCH AND APRIL

The James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures will present its annual spring series of free motion picture programs for children at Field Museum on Saturday mornings during March and April.

The first program, on March 7, "Family Afoot in the Yukon Wilds," tells the story of the far north as explored by a boy of eight and a girl of five. The films to be shown will be accompanied by a narrative given in person by Mr. and Mrs. William Albee, the father and mother of the child explorers. The films on the April 4 program, about birds, will be accompanied by a talk by Mr. Karl Plath, of the staff of the Brookfield Zoo, who will also show some of his own paintings of birds which have won him a notable place in the art world. In addition to the regular features, animated cartoons will be shown on several programs, and the closing presentation on April 25 will be composed entirely of Walt Disney's amusing films.

Following is the schedule of the entire series:

March 7—FAMILY AFOOT IN THE YUKON WILDS.

The far north explored by a boy of 8 and a girl of 5 (told by their mother and dad)
—William and Ruth Albee.

March 14—THE HAWAIIAN AND PHILIPPINE ISLANDS.

A cartoon included.

March 21—HOW ANIMALS DEFEND THEMSELVES.

A cartoon included.

March 28—SPRING IN NORTH AMERICA.

A cartoon included.

April 4—FROM PENGUINS TO PARADISE BIRDS.

Story of birds illustrated with motion pictures and paintings—by Karl Plath, Brookfield Zoo.

April 11—MIDDLE AMERICA.

A cartoon included.

April 18—AFRICAN STORIES.

A cartoon included.

April 25—A WALT DISNEY PROGRAM.

Composed of a series of cartoons.

There will be two showings of each program, 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, to be given in the James Simpson Theatre. No tickets are needed.

Field Museum of Natural History

FOUNDED BY MARSHALL FIELD, 1893
Roosevelt Road and Field Drive, Chicago
TELEPHONE: WARASH 9410

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

LUCKILY FOR STRATEGIC NEEDS U. S. HAS PLENTY OF FLUORITE

BY HENRY W. NICHOLS

CHIEF CURATOR, DEPARTMENT OF GEOLOGY

In the economic geology collection in Hall 36 and Frederick J. V. Skiff Hall (Hall 37) the minerals are so classified that the group in which a mineral appears suggests its principal use. Although some are perfectly obvious—iron comes from iron ore, copper from copper ore, and, as most people understand, bricks and pottery are made from clay—there are other minerals, as for example sulphur, with such diverse uses that a grouping according to use is impractical. Fluorite is such a mineral. Although large quantities of fluorite are consumed annually in the production of objects in familiar use, many people have no idea of what it is, how it is used, or for what purposes.

Few minerals exceed fluorite in beauty and variety of color, and its transparency and luster leave little to be desired. The gorgeous blue, green, yellow, and violet colors of the choicer crystals displayed in the mineral collection in Hall 34 suggest that fluorite is a gem, but strictly speaking it is not, for while it possesses the necessary brilliancy and color, it lacks two other essential qualities—durability and rarity. The crystals are so soft that they scratch and mar readily, and their cleavage is so well developed that they break easily. They are not scarce. Hundreds of pounds of fine crystals were included in the more than 182,000 tons of fluorite consumed in the

United States in 1939. The beautiful gem that fluorite could be, were it not for these defects, is demonstrated by several cut stones placed among the gems in H. N. Higinbotham Hall (Hall 31).

In spite of these defects it is used to some extent as an ornamental stone. In England a deep purple, fibrous variety called "blue John" is frequently carved into a variety of ornamental objects.

USED IN ALUMINUM SMELTING

The value of fluorite to industry depends not on its appearance or physical qualities but on its chemical composition. It is a combination of calcium and fluorine, with fluorine the useful component. When fluorite is substituted for part of the limestone flux in iron and steel smelting and other metallurgical furnaces, its fluorine content improves production. More than two-thirds of all the fluorite mined is consumed in this manner. Although this is the greatest it is not the most important use of fluorite. Fluorite or cryolite, another fluoride mineral mined only in Greenland, is absolutely essential for smelting aluminum. Without fluorite or cryolite, no aluminum is available except at prohibitive cost. Fluorite for this reason may be considered a "strategic mineral" essential in national defense, but fortunately there are abundant deposits of this mineral in the United States, enough to supply any possible need. Fluorine from fluorite or cryolite is incorporated into the electrolyte through which the aluminum passes from ore to metal. Much fluorite is consumed by makers of translucent and opaque glass.

Another important use of fluorite is in the manufacture of enameled metals of which the familiar enameled iron kitchenware is an example. Perhaps the optical applications of fluorite call for smaller quantities and higher qualities of this mineral than does any other important use. Scientists have found that with lenses made of fluorite they can conduct important microscopic and optical researches that would be impossible with glass lenses.

AN IMPORTANT ACID

If you visit a chemical laboratory you may see among the bottles of chemicals a bottle made of wax. This bottle contains hydrofluoric acid made from fluorite, an acid which cannot be stored in ordinary bottles because it dissolves glass. Advantage is taken of this corrosive action to etch patterns or inscriptions on glass.

Fluorides and other compounds made from the acid have varied important applications. Freon, an organic liquid containing fluorine, is widely used in mechanical refrigerators. Fluorides and silico-fluorides of sodium are coming into increasing use as insecticides replacing arsenic, for moth-proofing furs and woolens and for other purposes depending upon their disinfectant qualities and their destructive action on

insect life. Fluorides are also used in other diverse industries ranging all the way from the manufacture of dye stuffs to the bonding of grinding wheels.

Fluorspar is usually found in veins, often accompanied by ores of zinc, lead, and other metals. It is mined in many countries, but the largest deposits in the world are those in southern Illinois and western Kentucky, and there are other large deposits in the United States.

Wartime Guide-lectures

Among the March guide-lecture tours offered at Field Museum (a complete schedule of which will be found elsewhere in this issue) are two of special significance in the present emergency. On Friday, March 6, at 2 P.M., Mrs. Leota G. Thomas will discuss "Conservation as a Part of National Defense"; on Wednesday, March 23, Miss Miriam Wood will talk on "Sources of Materials Strategic to America."

Folklore of Garnets

Although every garnet in H. N. Higinbotham Hall of Gems and Jewels (Hall 31) is a genuine garnet, not one of them would pass the drastic test described by Johannis de Cuba in the fifteenth century. The owner of a garnet ring, while wearing the ring, was to disrobe and after smearing his body with honey lie down where there were wasps and flies. If flies or wasps refused to light on his body for the honey the garnet was genuine. Anyone who knows anything about wasps and flies knows there was little chance of thus proving garnet genuine.

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. Student 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.

SURVIVAL OF DROUGHT BY FISHES

BY ALFRED C. WEED
CURATOR OF FISHES

Many fishes are able to survive under conditions of extreme drought. The East African lungfish lives in muddy pools in a region where heavy rains alternate with prolonged periods of dry weather. When the dry season begins, this fish seeks refuge in the mud at the bottom of a pool. As the water disappears the fish burrows deeply into the mud. By moving around, it shapes a cell just large enough to contain its body. This cell keeps its shape as the mud dries. It becomes lined with a thin layer of dried mucus from the skin of the fish, forming a sort of cocoon.

In some way the fish manages to keep open a small hole from its cell to the surface of the mud. This allows for the small amount of breathing the fish does during the dry season. Under the intense heat of the sun the mud dries to the hardness of a brick and may be quarried out in blocks, each containing a living lungfish in its cell. The fish may exist in this dry condition for many years. Such specimens have been transported from eastern Africa to Chicago. If, through any accident, the block of dried mud should happen to be broken and the cocoon torn the fish would die unless it could be placed in water at once.

Lungfishes brought from Africa to the United States were kept in dry storage for more than five years and then revived by being placed in water. The water softened the mud and reached the fish, which began to drown. The discomfort caused them to struggle to the surface of the water where they could breathe. These lungfishes cannot obtain a sufficient amount of oxygen from the water by means of their gills, and must therefore make frequent trips to the surface to fill their lungs with air. Lungfishes in the intermittent swamps of central Africa seem to find this sort of occasional burial in dried mud a very simple way of surviving the dry seasons.

FISHES THAT SEEK FOOD ON LAND

Catfishes belonging to the genus *Clarias*, called "harmouth" by French-speaking people in the Sudan, live in the pools with the lungfish. When dry weather comes they, like the lungfishes, retire to the bottom and make holes in which they hide. It is reliably reported that they use these holes simply as retreats where they can have refuge from the heat of the sun. Many investigators have reported that various species of *Clarias* leave the ponds at night or on rainy or cloudy days to search for food on land. In cultivated districts they catch insects and are said to break down stalks of millet so they may eat the heads of grain.

Canon H. B. Tristram, who studied the fishes of eastern Africa and western Palestine, records that one day when he was traveling along the shore of the Lake of

Galilee near Semakh he saw a procession of *Clarias* following the course of a small brook that formed the outlet of a spring pool. There was hardly enough water to moisten the sand, which was quite dry in places. These large catfishes (each about a yard long) followed the course of the hidden stream. Canon Tristram took several



FARMERS PLOW THEM UP

Mud minnows (*Umbra*) found in midwest fields in spring

specimens to his encampment, where some were killed and cooked for the evening meal. Others were used on the following days. Later, the survivors were returned to the water where they seemed in no way injured by the hardships they had suffered.

Leon Vaillant, in 1895, published an account of some experiences of Dr. Suard, a French naval surgeon, who had been attached to an expeditionary force in Senegal. After his return with the expedition to Nioro he had time to study the fishes of the region. He found that he could keep *Clarias* alive in a tin biscuit box, feeding them a small amount of millet occasionally. It was necessary to close the box very carefully to prevent the fishes from hopping out and going to the fields at night. Dr. Suard carried his fishes alive in their tin box from Nioro to the port of embarkation (about 800 kilometers). On the ship, the box was stored in the boiler room, where the heat killed all the fishes. Dr. Suard preserved the specimens in alcohol and carried them to Paris where there was great disappointment that they could not have been brought back alive.

MUD DWELLERS OF THE AMERICAS

In the *Gran Chaco* of Paraguay and northern Argentina, a region of alternating savanna and marsh, there is found a pretty little fish, *Cynolebias bellottii*, known to aquarists as the "Argentine pearl fish." At the beginning of the dry season these fishes lay their eggs in the mud at the bottom of the pools. Strong dry winds quickly take away the water, leaving the fishes to die. Karl Thomas told in *The Aquarium* for September and October, 1933, how he took home a bit of dried mud from one of these ponds and put it in an aquarium, which he then filled with water. After about a week, approximately a hundred young fishes appeared, hatched from eggs that had been in the dried mud. These little *Cynolebias* all died because he did not have the proper food for them. Later, he tried the experiment again, with success.

In North America we have species of fishes that are able to live buried in the dried mud

at the bottom of a pond. About two years ago I helped fill a lily pool with mud from the bottom of a pond that had held water a few weeks earlier. Finding mosquito fish, *Gambusia*, in the pool the next day, I put a few handfuls of the mud in some water in a bucket. In less than an hour three *Gambusia* had come out of the mud and were swimming around in the bucket. When the pond dried up these small fishes burrowed down into the mud to wait for the summer rains to give them water in which to swim.

FISH PLOWED UP BY MIDWEST FARMERS

In the flat lands of the Middle West, farmers often find low parts of their fields too wet to plow in the spring. Later in the season they prepare these fields for other crops. Sometimes their plows turn up small fishes that, from their general appearance, they call "young dogfish." These are mud minnows, *Umbra*, more closely related to the pike than to the dogfish of our muddy rivers and ponds.

The mud minnow and *Gambusia* are essentially like ordinary fishes in the structure of their breathing apparatus and cannot survive long periods of drought unless they happen to bury themselves in ground that will remain slightly moist until the next rainy season. *Clarias* can stay away from the water for many days because it has on each side of its body a pocket in which it can carry water to moisten an extra breathing organ. The two species of African lungfishes have their air bladders developed as a lung-like organ with which they breathe slowly while encased in their cocoons in cells of hardened mud.

Besides the two lungfishes in Africa, there is a similar one in South America, especially abundant in the swamps of the *Gran Chaco*. We do not know whether its habits are similar to those of its African relatives. The other known species of lungfish is a native of the Mary and Burnett Rivers of southeastern Australia. This lungfish does not appear to make any special provision for protecting itself from drought.

Botany Chief Collects Cuban Palms

Dr. B. E. Dahlgren, Chief Curator of the Department of Botany, is spending several weeks in various parts of Cuba, making a survey of the palms of that island, which are very large in number and variety. Dr. Dahlgren is collecting specimens of important species required to fill out the exhibits of palms at the Museum.

Superstitious people often associate meteorites with miracles. One such meteorite, having an elaborate legendary history as having fallen to earth as a block of gold, then having been changed to silver, and finally to iron as a punishment of God visited upon a certain tribe of Arabs for their avarice, is represented by the Tamentit specimen in Hall 34.

SUNDAY LECTURES IN MARCH PRESENT RACIAL STUDIES

With practically the entire world at war, and nearly all races of mankind involved, the lecture "Parade of the Races" to be presented on Sunday afternoons during March by Mr. Paul G. Dallwig, the Layman Lecturer of Field Museum, has special interest and significance. This lecture is illustrated with the 100 notable sculptures by Malvina Hoffman of the principal races, primitive and civilized, living in all parts of the world today. Mr. Dallwig will emphasize for his audiences the physical



Copyright Field Museum of Natural History

ITURI FOREST PYGMIES, BELGIAN CONGO
Sculpture by Malvina Hoffman

characteristics that differentiate the races of mankind, and will also entertain his hearers with human interest stories concerning many of these peoples.

Because of heavy public demands, it is necessary to limit each audience to 100 adults (*children cannot be accommodated*). Those desiring to attend must make reservations in advance by mail or telephone (WABash 9410). The Sunday lectures begin promptly at 2 P.M. and end at 4:30. Midway there is an intermission for refreshments and smoking in the cafeteria.

In April Mr. Dallwig's subject will be "Romance of Diamonds from Mine to Man."

WEEKDAY LECTURE TOURS OFFERED IN MARCH

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 2: Monday—Animals of the Six Continents (Miss Elizabeth Best); Tuesday—General Tour (Miss Elizabeth Hambleton); Wednesday—Men of

the Old Stone Age (Miss Miriam Wood); Thursday—General Tour (Miss Marie B. Pabst); Friday—Conservation as a Part of National Defense (Mrs. Leota G. Thomas).

Week beginning March 9: Monday—The Indians of Latin America (Miss Elizabeth Hambleton); Tuesday—General Tour (Miss Elizabeth Best); Wednesday—Animals Found Round the World (Miss Elizabeth Best); Thursday—General Tour (Mrs. Leota G. Thomas); Friday—Life Usually Unseen (Miss Marie B. Pabst).

Week beginning March 16: Monday—Food Plants America Has Given the World (Miss Miriam Wood); Tuesday—General Tour (Miss Elizabeth Hambleton); Wednesday—The Variety of Animals in North and South America (Miss Elizabeth Best); Thursday—General Tour (Miss Marie B. Pabst); Friday—The Races of Mankind (Mrs. Leota G. Thomas).

Week beginning March 23: Monday—The Animal Exhibits and the Stories Behind Them (Miss Elizabeth Best); Tuesday—General Tour (Miss Elizabeth Hambleton); Wednesday—Sources of Materials Strategic to America (Miss Miriam Wood); Thursday—General Tour (Mrs. Leota G. Thomas); Friday—Our Native Trees (Miss Marie B. Pabst).

Week beginning March 30: Monday—The World's Housing Problem (Miss Elizabeth Hambleton); Tuesday—General Tour (Miss Elizabeth Best).

Persons wishing to participate should apply at North Entrance. Tours are free.

GIFTS TO THE MUSEUM

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

The Library:

Valuable books from Stanley Field, Lake Forest, Ill.; and from Fessenden National Memorial Association, Manteo, N. C.

Raymond Foundation:

From Santa Fe Railway Company, Chicago—2 cabinets with screens for filing lantern slides; from John W. Moyer, Chicago—20 kodachrome slides (bound).

Department of Anthropology:

From Max Kiehne, Frisco, N. M.—a stone ax and a string of stone beads, New Mexico; from Mrs. Benton S. Rogers, Reserve, N. M.—a toy pot, 3 stone implements, and a string of stone beads, New Mexico; from José Armijo, Frisco, N. M.—a stone ax and a San Francisco Red jar, New Mexico.

Department of Botany:

From Felix Woytkowski, Lima, Peru—20 herbarium specimens, Peru; from Joseph Daston, Chilbersburg, Ala.—a palm specimen, a wood specimen, and 37 cryptogamic specimens, Alabama; from Jardim Botanico de Belo Horizonte, Minas Geraes, Brazil—52 herbarium specimens, Brazil.

Department of Zoology:

From Boardman Conover, Chicago—a huron (weasel-like mammal) skin and skull, Peru; from John G. Shedd Aquarium,

Chicago—a specimen of carpet shark, Australia; from Chicago Zoological Society, Brookfield, Ill.—4 mammals and 6 birds; from Dr. Angel Maldonado, Lima, Peru—20 fish specimens, Peru; from Pedro Willim, Colonia Nueva Italia, Paraguay—169 insects, Paraguay.

NEW MEMBERS

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

Associate Members
C. H. Coyle, Louis EtsHokin

Annual Members

Edward M. Bronsky, Charles S. Burdick, Edward E. Carstens, Jr., Howard Mix Dancer, A. W. Edmonds, Mrs. Walstein C. Findlay, Jr., J. W. Floto, W. J. Foell, Martin S. Gordon, Edward Gudeman, Mrs. Arthur R. Hansen, Robert A. Heyden, Mrs. M. J. Isselhard, Dr. Maclyn M. Kamins, Arthur A. Lorenze, Robert K. Mielenz, Earl W. Nelson, Mrs. John K. Notz, Dr. Charles W. Olsen, Miss Edith P. Parker, Mrs. George B. Petty, Charles W. Pfleger, John A. Sauermaier, Dr. J. E. Smuk, Mortimer D. Stein, Abraham M. Streicher, Ernest G. Sundin, Mrs. Theodore J. Ticktin, Miss Theresa A. Weismantel.

Allied plants and animals of both recent and ancient times are contrasted in a synoptic exhibit in Stanley Field Hall (Case 17).

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.

Field Museum News

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No. 4

HOW LOGGERHEAD TURTLES LAY EGGS ON MOONLIT FLORIDA BEACHES IN JUNE

BY KARL P. SCHMIDT

CHIEF CURATOR, DEPARTMENT OF ZOOLOGY

The Florida sea beaches in mid-summer moonlight, though deserted by the seasonal visitors from the north, have a romantic interest to naturalists. It is at this season that these beaches, especially those on the Gulf side of the peninsula, are visited by the giant sea turtles that come ashore to lay their eggs on the moonlit nights of June and July. The sea turtles, though known as stragglers as far north as New York, are properly tropical creatures, as foreign to our temperate continent as the palms and crocodiles that mark the proximity of Florida to the torrid zone.

To see one of these gigantic sea turtles land in the dim light, drag its huge bulk up the shelving sand to high water mark, and set about making a nest for its eggs is to have a glimpse of a foreign and indeed an antediluvian world, for these creatures are

remnants of a group of reptiles once more numerous, more varied, and even more gigantic. For that matter, the turtles in general are "living fossils." They are so familiar that it is not often remembered that the turtle stock was old when the great dinosaurs themselves were young. There are two distinct living types of turtles that have invaded the sea, the leatherback turtle (not to be confused with the soft-shelled turtles of fresh waters), and the more familiar sea turtles including the edible green turtle and the loggerhead. Both of these families of turtles date from the Age of Reptiles.

The green turtle, so highly prized for its clear soup and for its flesh as well, is no longer common on the Florida coast,

though large numbers are brought to the cannery at Key West from the Caribbean coasts and islands. The mollusk-eating loggerhead, with more powerful jaws and correspondingly larger head, is little valued for food. This species still comes to the Florida coasts at its breeding season, though

Kesson, a local resident. Mr. Walters' interesting notes relate that a large female turtle was seen to land shortly before midnight. He writes as follows:

"At 11 P.M. on June 10, 1939, this turtle crawled from the water and, with unusual promptness, selected a nesting site. After bracing herself with her front flippers and pushing away the surface sand just behind her shell, she began to dig with deft alternate strokes of the hind flippers.

"The nest cavity completed, about 125 eggs were deposited in it at the rate of one every few seconds. Without hesitation, the turtle then filled in the cavity, thoroughly packing the sand by throwing her weight first on one flexed hind flipper and then on the other.

"Before starting for the sea the turtle advanced a few feet and obliterated the nest site by scattering sand far and wide with her front flippers. The entire operation consumed an hour, during

which period she remained indifferent to two observers and their lights."

The nest is not revisited by the mother. Incubation is by the heat of the sun. The young turtles emerge about two months afterwards as tiny miniature sea turtles that promptly make their way down the beach to the sea. What stimulus causes them always to head for the sea, and not inland, has been the subject of much speculation and experiment. It appears that once out of the nest they move downhill, and that they always move in the direction of the open horizon.

The loggerhead turtle group is opposite the habitat group of the American crocodile, another of the largest living kinds of reptiles, and these two scenes introduce the visitor



LOGGERHEAD TURTLE

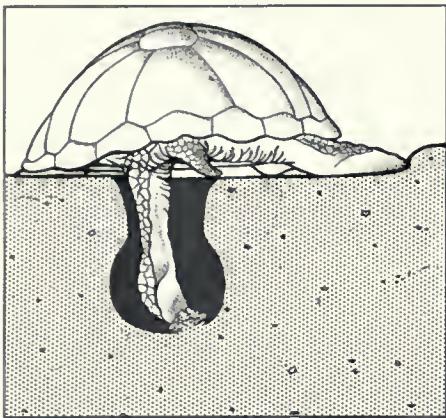
New habitat group showing large amphibian laying its eggs on a Florida beach at midnight

probably also in much smaller numbers than in the past. On remote oceanic islands, where sea turtles have no enemies, they come ashore in the daytime to rest on the beach and bask in the sun. On the Florida beaches they are now never seen by day.

An unmistakable record of its nocturnal visit is left by the egg-laying turtle in the broad and very characteristic track made in dragging its huge bulk over the sand. The nest is always placed above high tide mark.

The scene shown in a newly-opened group in Albert W. Harris Hall (Hall 18) represents the moonlit beach of Sanibel Island, on the Gulf Coast of Florida. It is dated June 10, 1939. On that night, Mr. Leon L. Walters, Staff Taxidermist at Field Museum, was patrolling the beach with Mr. G. J.

to the systematic exhibits of reptiles in Harris Hall. The backgrounds of both groups are panoramic landscapes by Staff Artist Arthur G. Rueckert. These two habitat groups result from collecting in the field and reconstruction in the Museum laboratories by Staff Taxidermist Walters, whose invention of a method of reproducing



DIGGING THE NEST

Diagram shows how the female loggerhead digs a flask-shaped nest in the sand with her scoop-like hind foot. After depositing more than a hundred eggs in it at the rate of one every few seconds, she uses her flippers to refill the cavity with sand, and then departs.

reptiles and amphibians in celluloid-like materials constitutes one of the most notable recent improvements in the art of taxidermy.

By the use of celluloid-like materials in making casts, with the coloring introduced into the translucent medium itself, the life-like translucent appearance of reptile scales or skin is produced; at the same time, since the finished cast does not require further painting, the full surface detail of the original mold is retained. The individual reptile models in the systematic exhibits in Hall 18 are the work of Mr. Walters, and are made by this process. Other notable exhibits made as celluloid models include the pig-like babirusa of Celebes in Hall 15, the hippopotamus and the white rhino in Carl E. Akeley Memorial Hall (Hall 22), and the group of Indian rhinoceros in William V. Kelley Hall (Hall 17).

This method of reproduction of reptiles and hairless mammals in cellulose-acetate or cellulose-nitrate, developed by Mr. Walters, is now widely known among museums as the "Walters Process."

Barber is Still Surgeon in Africa

Among African Negroes an itinerant barber sometimes acts as a surgeon. He relieves pain by "bleeding" or "cupping" with a hollow horn having a hole at the tip. The wide end of the horn is placed over a cut on the site of pain. The operator sucks air from the cup and plugs the hole at the tip of the cup with a pellet of wax which he pushes into position with the tip of his tongue. Bleeding continues until the cup

is almost filled. Such horn cups are shown as part of a barber's outfit in the Hall of African Ethnology (Hall D), Case 21.

TYPE SPECIMEN OF THE LARGEST NORTH AMERICAN DINOSAUR

By ELMER S. RIGGS
CURATOR OF PALEONTOLOGY

One of the problems in handling fossils in a large museum is that of preserving specimens that are of peculiar scientific interest but are not sufficiently attractive to justify public exhibition. In this category may be included many "type specimens"—specimens which are the first of their kind to come to scientific notice and publication. They are given a name and therefore become a kind of standard bearer for their particular cohort in the system of scientific classification. Such specimens in vertebrate paleontology often consist of odd parts which chance to be the first of their kind to be found, and so are given the post of honor to bear the name and to serve as standards with which others in turn are to be compared in this process of classification.

Into such a category falls the type specimen (holotype) of the gigantic dinosaur, *Brachiosaurus*. It consists of a series of vertebrae, fourteen in all, which extended from the middle of the animal's back to a point near the base of the tail. With them are a single bone of the pelvis (ilium), a thigh bone, a bone of the upper foreleg, one from the breast, and four great ribs. The thigh-bone and the upper foreleg bone are each six feet eight inches in length and weigh several hundred pounds. Other parts of the animal are proportionately large. The longest rib is nine feet in length, and some ribs are six to seven inches in breadth.

In addition to the great size of this animal, its unusual proportions give it interest. Most large dinosaurs have the foreleg much shorter than the hind leg, but in this animal the proportions are reversed giving it something of a giraffe-like proportion. When first brought to this museum in 1900 the size of the bones attracted popular attention, while the unusual proportions greatly interested scientists. For many years it had the distinction of being "the largest known dinosaur."

Fourteen years later parts of a similar animal, a little larger even than this one, were found in East Africa; later still, bones of dinosaurs even more ponderous were reported from South America. So the championship as to size was passed along, but still Field Museum's specimen remained the "type" or standard for the name *Brachiosaurus*.

For many years the two great leg bones were exhibited standing upright on a base, and as many of the vertebrae as would fit in were installed in an upright case. As more and more dinosaurs came to be known, these odd bones became no longer objects

of special interest and so their time came to be replaced by other exhibits. But the duty was incumbent upon the Museum and the paleontologists to preserve this type specimen for future study and comparison.

Accordingly, a larger glass-enclosed case has been built in one of the storerooms of an upper floor, and this half skeleton of the torso of *Brachiosaurus* has been assembled in it to be there preserved where any visiting scientist, or other person particularly interested in this type specimen, now outdated as an exhibit, may have permission to examine it.

FOUR MORE LECTURES IN SATURDAY SERIES

There remain to be given on Saturday afternoons during April four more of the lectures in Field Museum's spring course for adults. All of the lectures are illustrated with motion pictures, many of them in natural colors.

The lectures are to be given in the James Simpson Theatre of the Museum, and each will begin at 2:30 P.M. The Theatre entrance will be open at 2 o'clock each Saturday. 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 4—SCIENTIFIC DIVERSIONS IN PLANT LIFE.

Arthur Pillsbury.

April 11—PERU TODAY.

William B. Holmes.

April 18—THE PHILIPPINES.

Captain John D. Craig.

April 25—ADVENTURES WITH BIRDS.

Martin Bovey.

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 reservations will then be held in the Member's name until 2:30 o'clock on the day of the lecture specified. All reserved seats which have not been claimed by 2:30 P.M. will be made available to the general public.

The cockroaches are one of our earliest families—the little pests have been on earth for at least 250 million years. See the huge extinct kinds that lived long ago, as reproduced in the Carboniferous Forest group in Ernest R. Graham Hall (Hall 38).

MUSEUM HAS VAST COLLECTIONS FOR STUDY DURING PAN AMERICAN WEEK (APRIL 12-19)

Throughout the western Hemisphere, Pan American Week will be celebrated from April 12 to 19; the program in Chicago is sponsored by the Pan American Council.

Field Museum is cooperating by displaying in Stanley Field Hall during April a special exhibit emphasizing a few basic facts concerning hemispheric solidarity (see page 4).

On Friday, April 17, at 2 p.m., Miss Elizabeth Hambleton of the Museum staff will conduct a guide-lecture on "Arts and Sciences of the American Indians."

The nationwide observance of Pan American Week is promoted by the Pan American Union in Washington, and the Office of the Co-ordinator of Inter-American Affairs (Nelson Rockefeller's Committee). This year, due to the steps taken at the recent Inter-American Conference in Rio de Janeiro, and because of the inter-independence of the various American republics as a result of the war, there is more than ever before urgent need for greater unity and understanding between the United States and its sister republics.

The climax of the week's celebration will be on Tuesday, April 14, Pan American Day. This, says a statement issued by Chicago's Pan American Council, "is a day set aside to commemorate the idea of the political, economic, intellectual, and spiritual unity of the twenty-one republics of the Americas. On April 14, 1890, the First International Conference of American States, held in Washington, organized the Pan American Union. Widespread celebration of Pan American Day dates to 1930.

"Unification of the thoughts and aims of the free countries of the Western Hemisphere has been an ideal of statesmen in every American country since the days of the great Bolivar. Pan American Day expresses the reality of the ideals which all the Americas hold in common."

Dr. Paul S. Martin, Chief Curator of Anthropology, has been appointed official representative of Field Museum to the Pan American Council. He and other members of the Museum staff are co-operating in various ways with that organization.

Although Field Museum's interests are world-wide, it has always particularly emphasized Pan American material in both exhibits and study collections. Ever since the Museum first opened in 1894, one-half or more of its hundreds of expeditions have been devoted to the Western Hemisphere.

The following brief survey, by departments, can attempt to outline only in the sketchiest fashion the Museum's comprehensive permanent Pan American exhibits:

DEPARTMENT OF ANTHROPOLOGY

In the Pan American nations are numerous cultural factors important in binding them together. Increasingly recognized in this

regard are the large Indian populations, and the common heritage of Indian culture with its great influence on American civilization. The United States and Canada have relatively small though culturally important Indian populations; on the other hand, such countries as Mexico, Guatemala, Ecuador, Peru, and Bolivia are more than half Indian in composition. The Indian civilizations at the time of discovery of the New World were by no means identical, but they had sufficient in common to influence similarly the transplanted European culture in different parts of America, and today there are similar social and economic Indian problems in many Pan American countries.

The exhibits in the Department of Anthropology at Field Museum offer splendid opportunities for study of the Indian background of contemporary culture in the Americas. Here may be observed the common characteristics of Indian life, and the regional variations which have been signi-

ceremonies, villages, and pueblos, and life-size figures of men and women demonstrating characteristic costumes, equipment, and activities of everyday life.

DEPARTMENT OF BOTANY

The exhibits of the Department of Botany (except the woods) are arranged not geographically, but systematically according to botanical relationships or to applications of plants and plant products in industry. The Hall of Food Plants is naturally devoted in major part to North, Central and South America. There is a special exhibit of grains. Both beet and cane sugar are well represented. Dioramas show the methods used in Brazil in growing and treating cassava and coffee. Other series of exhibits include leguminous seeds, starches, spices, nuts, palms and their products.

One hall is devoted to woods of the United States, and another to foreign woods. The latter contains a large number of important cabinet and construction woods



LANDSCAPE IN SOUTHERN MEXICO

Prominent in the vegetation of subtropical America are these great plants, known as candelabrum cacti. One of a series of mural paintings by the late Charles A. Corwin, former Staff Artist of Field Museum, on the walls of Martin A. and Carrie Ryerson Hall (Hall of Plant Life). Two species of the giant cacti are shown—*Lemaireocereus Weberi* on the left, and *Pachycereus Chrysomallus* on the right.

fificant in the development of cultural differences in the various nations. Especially notable are the Museum's collections from different culture areas of the United States, Canada, Mexico, Guatemala, and the Andean countries of South America—the regions in which Indians were of greatest historical importance, and which have the largest Indian populations today. In addition to systematically arranged collections of Indian artifacts from each region illustrating such phases as social organization, religious ceremonials, warfare, arts and industries, hunting, fishing, agriculture, etc., there are miniature groups showing typical

from tropical America, particularly Mexico, the West Indies, Central America, and the Amazon Valley. Another hall is devoted to plant raw materials. Subjects of special exhibits are such plants as cotton, sisal hemp, tobacco, Brazilian and other rubbers, and American gums and waxes.

The Department's fifth and largest hall, known as the Hall of Plant Life (Martin A. and Carrie Ryerson Hall), contains exhibits arranged according to botanical relationships, designed to show, by means of accurate reproductions, the characters of the almost 300 families of plants native in America. Included are most of the im-

portant economic plants of tropical America. Large habitat groups show typical vegetation of the United States.

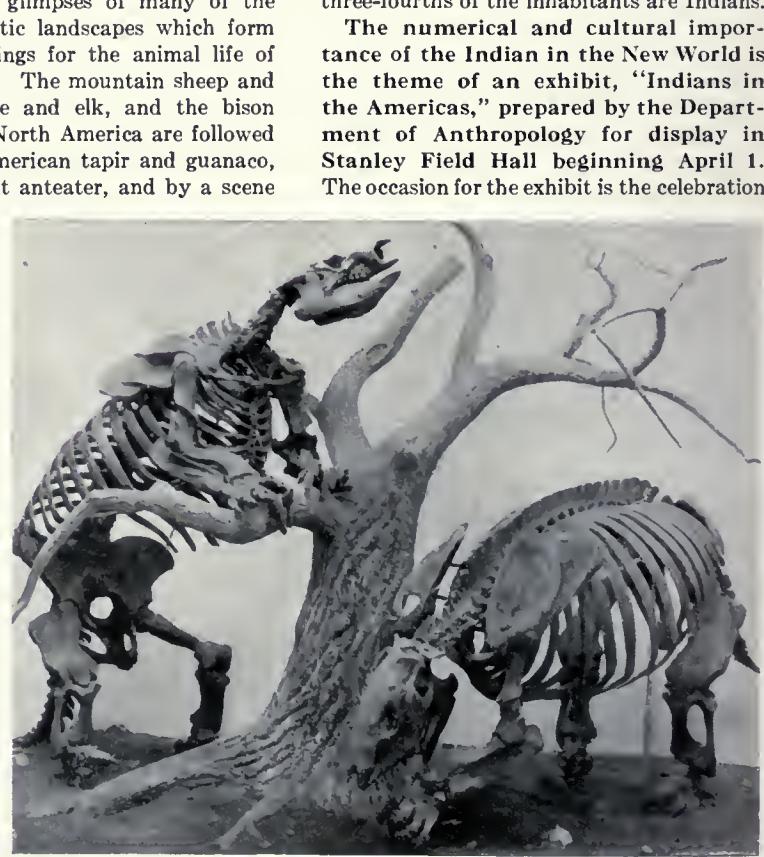
The study collections of the department contain large quantities of economic products, including tropical American woods, and other material. The Herbarium, with more than a million sheets of specimens, is

beasts which lived millions of years ago came from South America.

DEPARTMENT OF ZOOLOGY

The Museum has a good representation of the very strange-looking animals of various parts of Central and South America in its systematic collections of mammals and birds. These include, among mammals: opossums, armadillos, anteaters, tree sloths, numerous rodents, tapirs, carnivores, and a wide variety of monkeys. The scarcely less extraordinary assemblage of birds of the South American continent is represented by forms ranging from the ostrich-like rhea of the plains of Argentina and Brazil to the hummingbirds, which are confined exclusively to the Americas.

A walk through the hall of habitat groups representing the large mammals of North and South



SOUTH AMERICAN MAMMALS OF 1,500,000 YEARS AGO

The skeletons of two ground sloths of the Pleistocene Age, mounted in positions characteristic of their habits in life, as exhibited in Ernest R. Graham Hall. Collected by Marshall Field Paleontological Expedition to Bolivia.



LARGEST OF SOUTH AMERICAN DEER

Habitat group of marsh deer, on exhibition in Hall 16. The specimens were collected by the Marshall Field Brazilian Expedition in swamps along the Paraguay and Parana Rivers.

particularly rich in the flora of tropical America, especially the West Indies, Mexico, the Central American countries, Venezuela, Brazil, and Peru.

DEPARTMENT OF GEOLOGY

Latin America is well represented in the geological collections—in some sections better than any other part of the earth except the United States itself. In the mineral collection there is a special collection of the agate of Uruguay showing both raw agate and many choice polished specimens. In the Hall of Gems and Jewels are many precious and semi-precious stones from Latin America, ranging from Brazilian diamonds and Colombian emeralds to Argentine onyx. The Brazilian topaz, aquamarine, and amethyst attract much attention from Museum visitors.

In the mineral collection, the ores of the United States and Latin America are comprehensively represented. Heavily exploited deposits such as Mexican silver, Bolivian tin, Chilean nitrate and copper, and Brazilian manganese are illustrated by numerous specimens. Unexploited deposits which have future promise, such as the Brazilian iron and aluminum deposits, are also represented.

The Marshall Field Paleontological Expeditions to Argentina and Bolivia, conducted over many years, brought together the most comprehensive collection of South American vertebrate fossils to be found outside of Argentina. In the great Hall of Vertebrate Paleontology (Ernest R. Graham Hall), two out of three of the larger and more impressive fossil skeletons of giant

America affords glimpses of many of the most characteristic landscapes which form the natural settings for the animal life of these continents. The mountain sheep and goats, the moose and elk, and the bison and muskox of North America are followed by the South American tapir and guanaco, marsh deer, giant anteater, and by a scene representing a jaguar stalking a family party of the giant rodent known as the capybara on a tropical river bank.

Among the habitat groups of birds, thirteen represent the birds of North America, and seven are from the West Indies, and Central and South America. The bird life of Guatemala is represented by the gorgeously colored toucans and birds associated with them in the forest, a nesting colony of or-

pendulas with their six-foot hanging nests, and a pair of beautiful quetzals, adopted by Guatemala as a national emblem. The South American birds include the jabiru stork and the sun-bittern, the screamer and ibis, and the rhea with its nest of eggs and hatching young.

The largest reptile of tropical America, the American crocodile, is shown in a habitat group representing a scene on the shores of Lake Ticamaya in Honduras.

INDIANS NOT A VANISHING RACE, SPECIAL EXHIBIT SHOWS

BY DONALD COLLIER
ASSISTANT CURATOR, SOUTH AMERICAN
ETHNOLOGY AND ARCHAEOLOGY

Contrary to common belief, there are more Indians in 1942 than there were in 1492. While it is true that there has been a decrease in the Indian population of Canada and the United States from about one million to half a million at the present time, there has been a threefold increase of Indians in the Western Hemisphere from an estimated eight to ten million, when the white man first came, to thirty million today. And in most Pan American countries, *including* the United States, the Indian is the *fastest growing* element in the population! In such countries as Mexico, Guatemala, Ecuador, Peru, and Bolivia one-half to three-fourths of the inhabitants are Indians.

The numerical and cultural importance of the Indian in the New World is the theme of an exhibit, "Indians in the Americas," prepared by the Department of Anthropology for display in Stanley Field Hall beginning April 1. The occasion for the exhibit is the celebration

of Pan American Week (April 12 to 19), by all American republics. One part of the exhibit shows by means of color and symbols the present magnitude and location of important Indian populations. The remainder shows, through photographs and specimens, typical aspects of Indian life in different parts of the New World. Emphasis is placed on the fact that Indians everywhere are craftsmen—with their hands they make beautiful things to be used in everyday life.

Other exhibits in Stanley Field Hall of special interest for Pan American Week include a collection of prehistoric American gold ornaments from Colombia (Case 1); a display of rare lacquered wooden vessels made by the ancient Indians of Peru in the Inca and early Colonial periods (Case 6); some excellent examples of ancient Peruvian textiles (Case 20); and a representative



ANCIENT STELA FROM GUATEMALA

Exhibited in the Hall of Mexico and Central America (Hall 8) is this reproduction of a monument erected by the early Mayas. The original carved stone, dating to A.D. 804, still stands at Quirigua.

collection of pottery excavated from Pueblo ruins in the southwestern United States, dating from A.D. 700 to 1500 (Case 11).

Gemologists Hear Museum Lecture

About 100 delegates to the recent convention of the American Gem Society came to Field Museum March 17 for a lecture by Mr. Paul G. Dallwig, Layman Lecturer, and a conference with Mr. Henry W. Nichols, Chief Curator of Geology.

MUSEUM STAFF SUPPORTING

Many employees of Field Museum are signing up for regular purchases of United States Defense Bonds under a payroll allotment plan just inaugurated.

In support of the bond campaign, Dr. C. Martin Wilbur, Curator of Chinese Archaeology and Ethnology, furnishes the following bit about war financing in China between 200 and 100 B.C.:

"One attempted method under the 'Martial Emperor' was the creation of eleven ranks of new nobility based on war chest donations—the higher the donation the higher the rank. The central government exacted large contributions also from the old nobility. Those who failed to report their total wealth had their fortunes confiscated. The government, in addition to getting large amounts of cash, was temporarily embarrassed with such things as land, houses, and slaves."

Donald Collier, Assistant Curator of South American Archaeology and Ethnology, also

THINGS YOU MAY HAVE MISSED

The Odd Okapi, Rare Relative of Equally Curious Giraffe

The giraffe, heaven knows, is a queer enough animal, and would stand out (literally) in any crowd of beasts. Museums, zoos, and circuses, however, have made people so familiar with its peculiarities that its only extant relative, the rare okapi, paradoxically seems even more grotesque, although it is actually less radically strange than the now commonplace giraffe.

The okapi, without question one of the world's rarest animals, is represented by a fine mounted specimen in George M. Pullman Hall (Hall 13) of Field Museum. This specimen was obtained by the Marshall Field African Expedition some years ago. It was speared by pygmy natives in the Ituri Forest of the Belgian Congo—the records indicate that only one or two white men have ever seen this elusive species of animal alive in its native habitat. Hunters generally agree that it is the most difficult to bag of all African animals. The pygmy black people who inhabit the same limited area of the Congo as the okapi are usually extremely hostile to white men, and this adds to the difficulties which the animal itself presents by its rarity, and its shy, secretive, and nocturnal habits. The Museum's expedition had first to spend several weeks acquiring the good will of the pygmies before the hunt could begin, because the assistance of these small natives is practically indispensable to anyone who seeks to obtain a specimen of okapi.

Up until 1900 the existence of such an animal as the okapi was unsuspected by Europeans and Americans. In that year

SALE OF U. S. WAR BONDS

recalled ancient history as an argument for the American way.

"Just compare the modern bond idea with the way wars were financed by the Inca Empire which flourished from about A.D. 1200 to the Spanish conquest in 1532," said Mr. Collier. "Headed by a so-called Divine Ruler, this warlike empire was organized in two principal departments: that of civil administration, and that of conquest. The emperor's constant efforts to expand the empire required great supplies of arms and food for the armies, which were gathered like taxes from the people. Military storehouses constantly crammed with supplies were maintained. The Aztecs, operated on a similar plan. These supplies were moved to storage houses near taking-off points, often on the territory of allied peoples, prior to campaigns of conquest. Then the people back home had to scramble to replenish the original storehouse. They got no bonds, no interest, no repayment."

some strips of its skin were obtained from natives by Sir Harry Johnston, a British colonial administrator. These were at first identified tentatively as representing a new type of zebra. Subsequently an entire specimen, including skin, skull, and skeleton reached the hands of zoologists who were then able to make thorough anatomical studies leading to recognition of the animal's kinship with the giraffe.

The okapi's resemblance to the modern giraffe is less striking than that it bears to certain prehistoric ancestors of the giraffe with whose fossil skeletons it has been compared. The neck and legs are much shorter than those of the modern giraffe, but the teeth and horns are extremely similar.



QUAINT MAMMAL
Specimen of okapi in George M. Pullman Hall

Field Museum of Natural History

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

WHAT IS A SHAMROCK?

Now that St. Patrick's day is past, it should be possible to bring up the questions: "When is a shamrock not a shamrock?" and "What is a shamrock anyway?" without provoking too heated a controversy among partisans of various plants.

For, while nearly everybody speaks of the shamrock as if it were a specific plant, actually there is considerable dispute as to what particular plant is the true shamrock, it is learned by consulting Mr. J. Francis Macbride, Associate Curator of the Herbarium at Field Museum. (Incidentally, as a Caledonian Macbride, and not a Hibernian McBride, he is severely neutral among the disputants.)

About half of the Irishmen, and about half of the other people who have considered the matter, regard the plant known as the wood sorrel, which bears the scientific name *Oxalis acetosella*, as the true shamrock. The other half just as vociferously vouch that the true shamrock is the white clover, whose botanical-Latin designation is *Trifolium repens*. Another smaller school of thought has claimed that the rightful emblem of Eire is another clover called *Trifolium minus*. Still another asserts that the true shamrock is the black medic whose more esoteric designation is *Medicago lupulina*, and half a dozen other plants have adherents, among them even the water cress.

SHAMROCKS AS FOOD

And speaking of water cress, in the time of Spenser's "Faery Queen" some of the

other plants called shamrock were said to be good to eat.

An opinion based purely upon the evidence at hand would seem to recognize the white clover as the true shamrock, and this is supported by such noted Irish botanists as Keough, Theilkeild, and others, who aver that all history, romance, sentiment, and common sense unite in giving this honor to *Trifolium repens*.

The wood sorrel is sent in great quantities from Ireland to London for St. Patrick's Day; on the other hand, the clover is the plant most commonly used in Ireland. In Chicago, and all America, the shamrocks worn are usually a horticultural variant of white clover.

There is almost unity, at least, in the fact that nearly all of the plants for which the name shamrock is claimed have three leaflets, and that these leaves represent the symbolism of the shamrock, the story being that St. Patrick chose the plant to symbolize the Trinity. However, even this is disputed, for example, by the adherents of the water cress. Some say the three leaves are emblematic of love, valor, and wit, three charming traits of the Irish character.

THE SHAMRAKH OF ARABY

Perhaps it will be a shock to reveal that the trefoil plant was held sacred in Iran, and was emblematic of the Persian triad, long before St. Patrick's day; and that *shamroc* and *shamrakh* are Arabic words designating such plants.

A point brought out by those who acclaim the wood-sorrel as the true shamrock is that it is said usually to reach its growth perfection in Ireland about St. Patrick's Day, which is not true of the white clover.

Whichever plant is considered to be the true shamrock, all Irishmen and most other people will agree that "the sweet little, green little shamrock of Ireland" is from a sentimental point of view the most popular plant in the world today. Also, another plant associated with the Irish—although it originated in America and became known as Irish only through importation—is the potato, which, apart from sentiment, is probably the most popular plant in the world today from the standpoint of being the most widely known and the most useful to the peoples of all nations.

Dr. Dahlgren Returns from Cuba

Dr. B. E. Dahlgren, Chief Curator of the Department of Botany, has returned from a brief collecting trip to Cuba undertaken for the purpose of adding to the Museum's palm herbarium. Incidentally he found opportunity to investigate important potential sources of economic plant products which, because of interference with shipping, are becoming scarce or difficult to obtain from distant parts of the world. His collections have arrived at the Museum, and his work on plant products will be followed up by a chemist.

Director Gregg Now Lieutenant-Colonel

Clifford C. Gregg, Director of Field Museum, has been promoted from the rank of Major to that of Lieutenant-Colonel in the United States Army, it was announced early in March.

Lieutenant-Colonel Gregg, for years an officer in the Army Reserve Corps, has been in active service at Sixth Corps Area Headquarters in Chicago since September 1, 1940.

Staff Notes

Dr. Wilfred H. Osgood, Curator Emeritus of Zoology, is in Arizona and California, collecting study specimens of mammals.

Mr. Rudyerd Boulton, Curator of Birds, gave a lecture on "Camouflage in Nature" in the defense course at the School of Design on March 5.

Dr. Wilfrid D. Hambly, Curator of African Ethnology, has been appointed by the National Research Council in Washington as a member of its Committee on the Ethnography of Africa.

Mr. H. B. Harte, Public Relations Counsel, is assisting in publicity for the U. S. Defense Savings Staff.

FIELD MUSEUM HONOR ROLL

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Dr. Alexander Spoehr, Assistant Curator, North American Ethnology and Archaeology—Private, U.S. Army.

Bert E. Grove, Guide-Lecturer—American Field Service, in North Africa.

Patrick T. McEnery, Guard—Master-at-arms, U.S. Navy.

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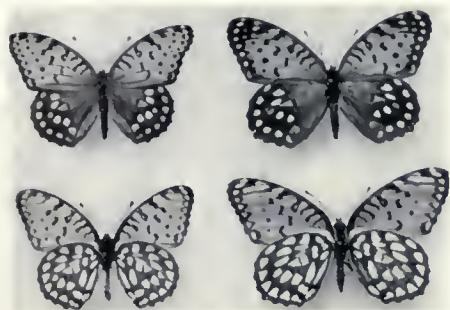
Nicholas Repar, Printer—First Class Seaman, U.S. Navy.

A NEW BUTTERFLY EXHIBIT

By WILLIAM J. GERHARD
CURATOR OF INSECTS

A case containing a selected series of the more attractive North American butterflies has recently been placed on exhibition in the west end of Albert W. Harris Hall (Hall 18). Thus, after a regrettably long delay, insects are again represented among the Museum's extensive zoological exhibits.

The exhibit begins with butterflies, as these sunshine-loving insects are especial



REGAL FRITILLARY BUTTERFLY

This butterfly (*Argynnis idalia*) is found from Maine to Arkansas. It is the most easily recognized of the six kinds of fritillaries found in the Chicago region, and may be identified by the large silver spots on the under side of wings. Top figures in the illustration show the upper side of male at left, and female on right; lower figures show the under side of each sex in same left-to-right order. The regal's caterpillar eats only the leaves of violets.

favorites with collectors, school children, and nature-lovers, and are most frequently inquired for by teachers of nature study. Specimens for three more cases of butterflies and moths have been prepared for exhibition; the North American cases will be followed by an exhibit of some of the most remarkable and brilliant exotic forms.

So many species of butterflies and moths are so nearly alike in shape, color and markings, that they can be separated only after a long and careful study. Therefore, only the more attractive and easily recognized species are suitable for exhibition. For this reason the specimens on display will always be much fewer in number than those contained in the Museum's reference collection, which is accessible to any person deeply interested in the study of insects. Furthermore, certain butterflies and most moths will fade or change in color when they are exposed to strong light for a number of years, and often such specimens cannot easily be replaced. Most of the moths and some of the butterflies formerly exhibited in the Museum are now valueless as a result of their exposure to daylight. It is believed that the fluorescent lights now used for the illumination of the Museum's zoological exhibits will have a much less injurious effect on the specimens.

LIFE-HISTORY SERIES INCLUDED

Most of the specimens in the new case are arranged so as to show the upper and

under surfaces of their spread wings, and both males and females are exhibited when they differ to a noticeable degree. At one end of the case is a display of the life-history of the pipe-vine swallowtail, the leaves and caterpillars reproduced in wax in a life-like shape and color. Butterflies are more frequently seen than the closely related and much more numerous moths, because with few exceptions, they are day-flying insects, whereas the moths are mostly night-fliers.

From all other insects butterflies and moths are easily distinguished by having four membranous wings, which are partly or wholly covered on both surfaces with minute overlapping scales and often with an admixture of fine hair. Their bodies and legs are also covered with scales, but this is true also in some other insects. The upper surfaces of the wing scales have fine longitudinal striae, or parallel shallow grooves, and when they are exceedingly close together—approximately 35,000 to an inch—they diffract the rays of light, producing the brilliant iridescent colors characteristic of a number of tropical butterflies and moths.

The scientific name of the order of insects to which the butterflies and moths belong is "Lepidoptera." This appropriate name is formed from two Greek words: *lepi*, a scale, and *pteron*, meaning a wing. As certain members of an order of insects or other animals often have similar structures that are believed to indicate still closer relationship, it has been found convenient and desirable to subdivide or classify them into smaller and smaller divisions, like sub-orders, superfamilies, families, subfamilies, genera, species, geographical races and seasonal forms. All of these divisions have definite latinized names. Many insects do not have common names, and, when they do, they of course are not the same in different countries; but the scientific names, except for special reasons, are not affected by the language of any country. The carefully prepared labels in the new exhibit form an excellent introduction to the subject of zoological classification and nomenclature.

ONE HUNDRED THOUSAND KINDS KNOWN

Butterflies and moths are usually divided into two suborders named respectively Rhopalocera and Heterocera. The former name is formed from two Greek words meaning "a club and a horn;" the latter is derived from the same source and means "different and a horn." As the scientific names of these two suborders imply, butterflies have antennae (feelers) that are slender and swollen or clubbed at their tips, whereas the antennae of moths are either feather- or thread-like. Members of both suborders are found in nearly every part of the world. The range of their distribution extends irregularly from Alaska, Greenland, and Spitzbergen southward to Cape Horn and

the Cape of Good Hope; and from sea level to elevations as high as 16,000 feet. About 100,000 species and races of these scaly-winged insects are known to science. No less than 9,876 species of moths and butterflies, as well as a number of geographical races, seasonal forms, and aberrations, are recorded from America north of Mexico; 992 of these are butterflies.

Like many other insects, butterflies and moths have four stages in their life-history: the egg; caterpillar or larva; chrysalid or pupa; and the adult stage. The caterpillars or larvae have their mouth parts fitted for chewing, and it is in this stage that a few butterflies and many moths are destructive. In the adult stage their mouth parts are adapted only for sucking up liquid food, like the nectar of flowers, the sap of trees, and the juices of fruits. Some moths are incapable of feeding on anything during their adult stages.

LORD AND LADY HALIFAX VISIT MUSEUM

"In England we had heard so much about Field Museum that upon our arrival in Chicago we insisted on making a visit to this great institution."

With this gracious remark made by Lady Halifax, she and Viscount Halifax, British



Photograph courtesy of THE CHICAGO SUN

BRITISH AMBASSADOR AT FIELD MUSEUM
Malvina Hoffman's striking portrayal in bronze of a typical Tamil of India, climbing a "toddy palm," catches the eyes of Lord and Lady Halifax. They were escorted by Mr. Stanley Field (center), President of the Museum.

Ambassador to the United States, introduced themselves at the Museum during their recent stop-over in Chicago.

Mr. Stanley Field, President of the Museum, and Mr. Orr Goodson, Assistant to the Director, conducted the distinguished guests on a tour of certain exhibition halls in which Lord and Lady Halifax were most interested. Particularly was Lord Halifax impressed by the Malvina Hoffman sculptures in the Hall of the Races of Mankind.

STORIES OF FAMOUS DIAMONDS IN APRIL SUNDAY LECTURES

"The Romance of Diamonds from Mine to Man" is the subject of the Sunday afternoon lectures to be presented during April by Mr. Paul G. Dallwig, the Layman Lecturer of Field Museum. Illustrating his subject with exhibits in the halls of the Department of Geology, and in H. N. Higinbotham Hall of Gems and Jewels, Mr. Dallwig will tell dramatically the stories and legends surrounding some of the world's most famous diamonds. He will also tell about the original finding of diamonds in South Africa, the diamond rush that followed, and the processes involved from the time of finding specimens in the mine through the various stages of sorting, cutting, polishing, pricing, and marketing. All of the human interest angles connected with diamonds will be especially emphasized in Mr. Dallwig's lecture.

Because of heavy public demands, it is necessary to limit each audience to 100 adults (*children cannot be accommodated*). Those desiring to attend must make reservations in advance by mail or telephone (WABash 9410). The Sunday lectures begin promptly at 2 P.M. and end at 4:30. Midway there is an intermission for refreshments and smoking in the cafeteria.

In May, which will be the last month during the current season in which the Sunday afternoon lectures are offered, Mr. Dallwig will introduce a subject not hitherto presented in his repertoire—"Who's Who in the Mounted Zoo."

FREE MOVIES FOR CHILDREN CONTINUE THROUGH APRIL

The James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures will present four more free programs of motion pictures in its spring series for children at Field Museum on Saturday mornings during April. Following is the schedule of the remaining programs:

April 4—FROM PENGUINS TO PARADISE BIRDS.

Story of birds illustrated with motion pictures and paintings—by Karl Plath, Brookfield Zoo.

April 11—MIDDLE AMERICA.

A cartoon included.

April 18—AFRICAN STORIES.

A cartoon included.

April 25—A WALT DISNEY PROGRAM.

Composed of a series of cartoons.

There will be two showings of each program, 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 adults. Teachers are urged to notify their classes about these programs in the James Simpson Theatre.

WEEKDAY LECTURE TOURS OFFERED IN APRIL

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:

Wednesday, April 1—The People of China and India (Miss Elizabeth Hambleton); Thursday—General Tour (Miss Elizabeth Best); Friday—Plant Products of Pacific Lands (Miss Marie Pabst).

Week beginning April 6: Monday—What Endures in Civilization (Mrs. Leota G. Thomas); Tuesday—General Tour (Miss Elizabeth Hambleton); Wednesday—High and Low in the Animal Kingdom (Miss Elizabeth Best); Thursday—General Tour (Mrs. Leota G. Thomas); Friday—Spring Wild Flowers (Miss Marie Pabst).

Week beginning April 13: Monday—Man's Rise from Prehistoric to Contemporary Times (Mrs. Leota G. Thomas); Tuesday—General Tour (Miss Marie Pabst); Wednesday—Bird Life in the Chicago Region (Miss Elizabeth Best); Thursday—General Tour (Miss Marie Pabst); Friday—Arts and Sciences of the American Indians (Miss Elizabeth Hambleton).

Week beginning April 20: Monday—Primitive Musicians and their Instruments (Miss Elizabeth Hambleton); Tuesday—General Tour (Miss Elizabeth Best); Wednesday—Geology in National Defense (Miss Marie Pabst); Thursday—General Tour (Mrs. Leota G. Thomas); Friday—The Races of Mankind (Miss Elizabeth Hambleton).

Week beginning April 27: Monday—Animals Found Around Chicago (Miss Elizabeth Best); Tuesday—General Tour (Mrs. Leota G. Thomas); Wednesday—Ornaments and Jewelry (Miss Elizabeth Hambleton); Thursday—General Tour (Miss Elizabeth Best).

Persons wishing to participate should apply at North Entrance. Tours are free.

GIFTS TO THE MUSEUM

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

Department of Anthropology:

From Mrs. Chauncey McCormick, Chicago—3 necklaces (two Roman, 4th century A.D., and one Islamic); from Mrs. Jessie V. Bicknell, Des Moines, Iowa—2 bolas, Argentina.

Department of Botany:

From Donald Richards, Chicago—285 specimens of bryophytes and 30 herbarium specimens, United States; from Dr. R. L. Taylor, Cleveland, Miss.—23 specimens of algae, Mississippi; from Dr. M. A. Brannon, Gainesville, Fla.—44 specimens of algae, Florida; from Professor Angel Maldonado, Lima, Peru—46 specimens of algae, Peru;

ARE YOU MOVING? OR GOING SOMEWHERE?

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.

from Richard D. Wood, Evanston, Ill.—85 specimens of Chara, United States; from Dr. Walter Kiener, Lincoln, Neb.—191 specimens of algae.

Department of Geology:

From Ray G. Swigart, Rifle, Colo.—incomplete skull of titanotherium, late Eocene deposits, western Colorado.

Department of Zoology:

From Chicago Zoological Society, Brookfield, Ill.—2 snakes and 3 mammals; from Leander J. McCormick, Chicago—2 fish specimens, near Havana, Cuba; from Dr. Henry Field, Washington, D.C.—29 salamanders, tadpoles, and toads, North Carolina; from Gordon Gunter, Rockport, Tex.—340 fish specimens, Texas.

The Library:

Valuable books from Toledo Museum of Art, Toledo, Ohio; from James H. R. Cromwell and Dr. Henry Field, Washington, D.C.; and from Miss Elizabeth Hambleton, Bryan Patterson, and Dr. Fritz Haas, all of Chicago.

NEW MEMBERS

The following persons became Members of Field Museum during the period from February 17 to March 16:

Associate Members

Carl Buddig, Leigh B. Block, Louis Porter, Ainslie Y. Sawyer.

Annual Members

Robert A. Andrews, Percy H. Arden, Mrs. Mary E. Baker, Rudolph Bohrer, Herbert P. Brettman, Ralph E. Briggs, Mrs. Albert Cotsworth, Jr., Mrs. John T. Drysdale, Jr., Harold Flagler, Samuel I. Frank, Mrs. Steve Gavin, James M. R. Glaser, Dr. Louis Goldblatt, Samuel Halper, Dr. Arthur J. Hanson, Harry Hardwicke, Raymond A. Hoffman, Dr. C. Helge M. Janson, Miss Mary C. Kretzmann, Philip C. Lovejoy, Mrs. Franklin Marling, Jr., Dr. Josiah J. Moore, Dr. Vernon D. Nerger, Potter Palmer III, Harry George Prizant, J. T. Rankin, Robert C. Ransom, August Rassweiler, William E. Salomon, Jean L. Schureman, John A. Sidney, Mrs. Louis O. Sordahl, Dr. Elsie M. Tichy, L. Norton Wrisley, John E. Yates, Mrs. Walter Zitzewitz, Mrs. LeRoy J. Zorn.

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SOUTH AMERICA CAN AT BEST SUPPLY ONLY FRACTION OF U. S.' RUBBER NEEDS

By B. E. DAHLGREN

CHIEF CURATOR, DEPARTMENT OF BOTANY

A standard work on vegetable raw materials published in 1928 lists 488 plants known to yield rubber. The number known has been greatly increased since, and is usually roughly stated as more than 1,000. The Russian search for rubber sources is said to have revealed as many as 7,000, of which only 14 were considered of economic value. It is quite evident that a large number of plants have a milky sap or latex which solidifies as a sticky elastic rubber-like substance; also that of this very large number, only a few have up to the present time been of much practical importance. The overwhelmingly greater part of the entire world supply of rubber is, in fact, derived from a single botanical source, viz., the Brazilian rubber tree *Hevea brasiliensis*, native in parts of the Amazon region. It was the transplantation of this to Ceylon in 1876 by seeds obtained in Brazil, and by plants to Singapore, and its large scale cultivation in the Malay Peninsula and the East Indies, that made possible the rapid expansion in the use of rubber which has taken place in the last thirty years.

The world's production of rubber has recently (1940) reached a total of 1,500,000 tons. Of this vast quantity, more than 1,200,000 tons were produced in Malaya and the Netherlands East Indies, in the proportion respectively of about seven to five. Most of the remainder was contributed by other Asiatic countries: Ceylon almost 100,000 tons; India a small amount; the now Japanese-occupied French Indo-China

and Thailand, Burma, Sarawak and North Borneo, altogether somewhat less than 200,000. Compared with all this, the African and South American production of about 20,000 tons each is truly insignificant, especially in view of present large requirements of the United States. In 1940, 670,000

has sparse population, and in most of the places where the trees are found the operators of rubber concessions and the enterprising prospectors who exploit the territory adjacent to the upper reaches of the rivers are obliged to bring their labor from more populous regions. The conditions of living

in remote places in the forest are often of notable difficulty. The hardships of the rubber gatherer's life—its isolation and attendant dangers—have become proverbial in all places where the labor needed may be enlisted; likewise, rumors of high maintenance costs which must be paid by workers in places where all supplies are brought in from distant cities. Costs multiply with each shift or relay on the way up the rivers.

Because of these conditions and others—including lack of proper sanitation and accompanying high incidence of disease—that surround the gathering of forest-grown rubber, only the most favorably situated parts of the Amazon territory can produce at all in com-

petition with the Far East's compact and well managed rubber estates and auxiliary thousands of small plantations, operated in a region with an abundant population.

With the production of these eastern plantations now cut off, however, the existence of wild rubber trees in the Amazon again becomes a matter of importance. The number of such trees is unknown, but has been estimated at 200,000,000 to 300,000,000. The questions of how much rubber may actually be obtainable from them, and how soon it may become available, are somewhat difficult to estimate.



A DAILY TASK IN A BRAZILIAN RUBBER DEPOT

Amazon crude rubber comes to market in the form of large balls, produced by pouring the latex collected on a paddle or stick upon which it coagulates when revolved in the smoke of a palm nut fire. At the warehouse each ball is cut in two, as shown above, for examination before shipment. If the layers are not uniform they can be separated and pulled apart for grading and sorting. Photograph by Marshall Field Botanical Expedition to Brazil.

tons were used in our country (out of an importation of more than 800,000, more than half of the world's production).

WILD RUBBER OF THE AMAZON

Before the development of the eastern plantations the Amazon basin was without a rival as a source of supply. Hevea trees of several species there grow spontaneously in the forests of an immense region including the northern states of Pará and Amazonas, northern Matto Grosso, and the territory of Acre (all in Brazil); and parts of adjoining Bolivia, Peru, Ecuador and southern Colombia. The greater part of the territory

One can only judge from past records and such indications as exist. The peak of production in the Amazon was reached just before the eastern plantations began to yield rubber in quantity. The average price of Pará rubber at the time was equivalent to about \$1.10 per pound. As much as ten or eleven shillings per pound is said to have been asked in 1910 by exporters in Manaós and Pará.

In 1912 the Asiatic production, which began with one thousand tons in 1907, had reached 28,000, while 42,000 tons were produced in Brazil, and enough more from extra-Brazilian parts of the Amazon region to increase the South American total by a few thousands. The very next year the rapidly increasing East Indian output surpassed that of Brazil, and in succeeding years doubled and tripled. The Amazon rubber boom then definitely collapsed, though not one-tenth of the wild rubber trees of Brazil and surrounding territory had been utilized. With falling prices (50 cents a pound in 1920, then suddenly less than 20 cents) the Amazon production continued to diminish, becoming less and less profitable until it reached a low point of 8,000 tons gathered in the most accessible localities only. Since then there has been only a slight recovery. The 1939-40 production was 20,000, the exportation 12,000 tons—barely enough for a week's supply in the United States alone.

Not all the rubber of the Amazon is prime Pará rubber, and not all of it is the product of *Hevea brasiliensis*. Various other species of Hevea trees yield rubber of slightly inferior characteristics, but help increase the total output, and even trees of other genera, Castilla or "caucho," and Sapium, contribute to the bulk. The first rubber plantations on the American continent were, indeed, of Mexican Castilla, but were abandoned when the superiority of Hevea was realized. Sapium exists in several species at the higher elevations on the western margin of the Amazon basin, in Bolivia, and in the forest or "montaña" of Peru to Colombia and Venezuela. Indeed, much of the rubber exported from the latter countries consists partly or predominantly of Sapium and is esteemed as good rubber, excellent for many important purposes, although when it is mixed in the field with Hevea rubber it is considered an adulteration of the latter.

In connection with Sapium rubber it is interesting to recall that seeds of species of Sapium for experimental planting in the southern Caucasus region were gathered some years ago in the Andean countries by a Russian expedition. On arrival in Russian territory, after their long journey, the seeds would not germinate and it is said that the chief of the Russian Bureau of Plant Industry only with great difficulty was able to save the explorers concerned from execution for sabotage.

The conditions surrounding the gathering of forest-grown rubber have in the course of years been somewhat improved, but in most respects remain essentially as they were when Brazilian rubber production was a matter of great importance to the world.

LABOR IS PROBLEM

Methods of tapping the trees have become less destructive and more efficient. Better sanitation and medical service, and more rapid and dependable river transportation can be provided without great difficulty, but the labor supply is, unfortunately, as scarce as ever in most parts of the Amazon, and must be recruited or supplied from outside, though it is said that the number of rubber gatherers engaged at no time exceeded five thousand. Introduction of labor from elsewhere raises an always troublesome immigration question, and there are few places in the American tropics with an excess population. Nevertheless, granted a considerable increase in price to cover risks and cost of collection and transportation, with enough more guaranteed to stimulate a special effort, an output of 50,000 tons within a few years would seem a not unreasonable expectation, and if the demand should continue, in time perhaps twice as much would become available.

Miscellaneous minor sources of rubber will be utilized to the fullest practicable extent, such as the guayule of which Mexico in 1940 produced 4,000 tons, but this, like the dandelion root kog-saghiz (a perennial planted in Russia in 1940 to the extent of 170,000 acres), requires several years of growth in order to attain any considerable size and rubber content. Commerce will doubtless be renewed in some species of rubber now practically abandoned, such as Ceará, and Manicoba.

Rubber tree seeds and seedlings are being currently distributed to various tropical American countries, where with proper care they should eventually contribute to the rubber supply of the western hemisphere, and thereby help reduce future dependence on eastern production. In this connection it may be interesting to note that more than one-half of all the rubber of Asia is produced on small plantations averaging not more than about 100 acres each.

A search is also being made for a rubber source plant that might be grown on a large scale as an annual crop, but it appears at present to be very unlikely that within a

lifetime either a new rubber yielding plant or new plantations in the western hemisphere will substitute or displace the *Hevea* rubber of the Asiatic tropics which undoubtedly



A LOT OF THAT RARE SUBSTANCE, RUBBER—

—yet it's only a drop in the bucket, considering our national needs. This photograph, taken by the Marshall Field Botanical Expedition to Brazil, shows a typical scene in a warehouse in the rubber-growing state of Para, at Belem, the Amazon delta port from which most of the meager South American supply is shipped.

will become available again, by military force or otherwise.

SYNTHETICS MAY PROVE BEST SOLUTION

There appears, on the other hand, to be a distinct possibility that the present loss of the eastern plantations will lead to achievements in the production of synthetics that in the long run may reduce even prime plantation or Pará rubber to a secondary or competing place.

A 100,000-ton synthetic production is apparently to be expected within a year, as an aid to the existing, carefully rationed stock of crude and reclaimed rubber. The reclaimed product may enter into the output of rubber manufactures to the extent of more than the usual one-third.

In the meantime it is apparent that if a relatively speedy restoration of the rubber supply from the East cannot be achieved, the solution of the rubber supply problem will have to be assumed mainly by the chemical industries.

A graphic synopsis of noteworthy facts about the sugar industries, both cane and beet, is presented by exhibits in the Hall of Food Plants (Hall 25).

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 7 (Labor Day).

SPRING WILD FLOWERS—

If you like them, and want to know more about them, read, *Spring Wild Flowers*, and *Spring and Early Summer Wild Flowers*, two illustrated leaflets 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 FIELD MUSEUM—25 cents each.

HEAD DEFORMATION

Endeavors to improve on nature by modifying in some way the human figure are very common. In many cases even the head form is changed by causing the developing skull to take a different shape under pressure. A peculiar contrivance for accomplishing this, used by the Milanaus, one of the Dyak tribes of Borneo, is shown in Case No. 39 in Hall G.

A padded block fastened to a wooden bar is placed on the forehead, and the ends of the bar are attached by two cords to a band around the back of the head. By tightening the cords the pressure can be increased. The cords are passed in opposite directions through a hole in a coin or similar object which can be used to twist the cords. In this way the pressure may be gradually increased. The cords fastened to the back band on each side pass through holes in the ends of the bar and along its front, the coin being about the center of the bar.

This apparatus is used on children while they are very young, beginning usually within the first month after birth. The pressure is not applied continuously, but only for about fifteen minutes on successive days or at somewhat longer intervals for a month or so, ten to twenty applications being sufficient to bring about the desired effect. The pressure is applied only when the child is asleep, and is relaxed if it cries.

The effect of this treatment is slightly to flatten and broaden the head, giving a more rounded face, this being the most admired form. Only female children, as a rule, are thus treated.

DO YOU KNOW THAT—

—people of some of the native tribes of eastern Siberia use clothing made of fish skins? Skins of large fishes such as carp, salmon and trout are treated so as to be almost as flexible as cloth and are then made into various garments for men and women. For ceremonial and other special purposes these garments of fish skin are ornamented with appliquéd patterns made by sewing bits of dyed fish skin in patterns on pieces of cloth that are then attached to the garments. Garments made of fish skin are exhibited in several cases in Hall L (Asiatic Ethnology). —A.C.W.

FIRST WOMAN AVIATRIX OF CHINA VISITS FIELD MUSEUM

Miss Lee Ya-ching (formerly of Shanghai, and later of Hong-Kong), noted because of her accomplishments as the first woman in China to qualify as an aviation pilot, visited Field Museum on April 15. Dr. C. Martin Wilbur, Curator of Chinese Archaeology and Ethnology, acted as host, representing the Museum. Miss Lee was especially interested in observing how the Museum's comprehensive collections interpret the arts, sciences, and general culture of her country to Americans. These collections, the largest assemblage of Chinese archaeological and ethnological material in the Middle West, occupy three halls: George T. and Frances Gaylord Smith Hall (Hall 24), Hall 32, and the Hall of Chinese Jades (Hall 30) which contains more than a thousand exquisitely carved jade objects.

Miss Lee, who has served her country in the air at home, is now in America making a tour of our principal cities in the interest of United China Relief. She is flying her own airplane on many of her journeys in this country.

In recognition of the China Relief activities, Saturday, April 18 was designated as "China Day at Field Museum" by Lieutenant-Colonel Clifford C. Gregg, Director. On that day the Museum was the scene of a celebration by a group of children from Chicago's Chinatown, and their mothers. Dr. Chang-Lok Chen, Consul-General of China in this city, and officials of United China Relief, were present.

The exhibits in Hall 24 illustrate the development of Chinese civilization in all its varied

phases from its beginnings in the Neolithic period (about 2000 B.C.) down to the latter part of the 18th century. There are two main divisions: the ancient original culture of China prior to the intrusion of Buddhism, and the culture of Buddhist China, as influenced and modified by religious and artistic currents coming from India about the third century A.D.

In Hall 32 modern Chinese culture is illustrated. Extensive exhibits explain the Lamaist religion of Tibet. One section is devoted to Chinese and Tibetan theatricals, and presents all the main scenes in a drama based on the conception of Hades which forms a part of the Taoist religion.



Chicago Daily News photo

FINDS MONUMENT OF HER HOMELAND IN MUSEUM

Miss Lee Ya-ching, first woman aviatrix of China, inspecting marble lion which once guarded the entrance to a Manchu Empire government building in Peking, with Dr. C. Martin Wilbur, Curator of Chinese Archaeology and Ethnology, and Joanne Westphal (left center) and her sister Ruth. The little girls, whose home is in Stanton, Michigan, and Miss Lee, who is touring the United States in the interest of United China Relief, were equally fascinated by Field Museum's extensive collections from China.

**Museum Fossil Hunter Returns
from Honduras Expedition**

Mr. Paul O. McGrew, Assistant Curator of Paleontology, returned to Field Museum April 20 from a paleontological expedition he has been conducting in Honduras since November. Assisting Mr. McGrew in his explorations were Mr. Albert Potter, Curator of the Museum of the Chadron (Nebraska) State Teachers' College; Señor Eliseo Carabantes, a Honduran school master, and

a Honduran Indian who served as camp man, cook, and muleteer.

Mr. McGrew obtained some 250 fossil specimens of mammals of both early Pliocene age (7,000,000 years ago) and Pleistocene age (500,000 years ago). He will publish an account of the expedition's work in the next issue of FIELD MUSEUM NEWS.

Much amethyst comes from the hollow agates which are found in Uruguay.

A SPECIAL WARTIME EXHIBIT OF "STRATEGIC MATERIALS"

BY SHARAT K. ROY
CURATOR OF GEOLOGY

Editor's Note: A special wartime exhibit of the materials defined by the United States Army and Navy Munitions Board as "strategic," "critical," and "essential"—together with a colored map of the world, twelve by seven feet in dimensions, showing where each comes from and why many are now so difficult to obtain—may be seen in Stanley Field Hall.

The exhibit was installed by Mr. Harry Changnon, Preparator in the Department of Geology, under the direction of Dr. Sharat K. Roy, Curator of Geology. Mrs. Anne Harding Spehr, an artist on the Museum staff, painted the map in attractive style.

Today the United States is engaged in a desperate war, the scope and magnitude of which is far beyond anything known in the history of man. This war *must* be won, for in it is involved the future of the whole of

nately, as it must, that dangerously wasteful period of indecision and lack of cohesion has now come to an end, and the spirit to strip for action is unmistakably here. There is no longer doubt in anyone's mind that we are engaged in a titanic struggle of such vast proportions that it cannot be fought and won except by putting the entire resources of the country to work. In fact, this is a war of resources and production—of competitive production. The side which can outproduce the other is the side which is destined to tip the balance of the war in its favor.

Can we outproduce the axis? It is not merely patriotic instinct to say "yes"; facts and figures prove that we can. But we must not delude ourselves. When we say we can,

Have we *all* the raw materials indispensable to our military requirements and to victory? The answer is discouraging. We have not.

DEFICIENCIES IN FIFTEEN ITEMS

This blunt fact may shock, even dismay those who have never doubted the strength of America's vast natural resources. It is true that the United States is the dominant mineral nation. It has adequate reserves of most of the high tonnage minerals—coal, oil, iron and the like, and an abundant supply of a host of lesser raw materials essential to its needs. It is self-sufficient to a degree beyond any other country. But despite this favored position, it is not wholly self-sufficient.

In reality, no modern industrial nation is self-sufficient. For some understandable but inexplicable reasons Nature has not distributed her gifts to mankind equally over the globe. America may rightfully rejoice in being the recipient of the lion's share of Nature's wealth, but at the same time it cannot afford to ignore the grim reality that it is deficient in certain vital raw materials without which it cannot exist as an industrial power, much less win the war. These deficiency materials consist of fifteen items, namely: aluminum, antimony, chromium, manganese, mercury, nickel, tin, tungsten, coconut shell-char, manila fiber, optical glass, quinine, rubber, silk, and wool. The Army and Navy Munitions Board has designated them as "strategic" materials or materials which are *indispensable* to our military requirements in time of war (and essential to the maintenance of our economic order in time of peace), for which we are *dependent* in whole or in part on sources outside the continental limits of America.

FEW REALIZE AXIS GAINS

To be sure, we have stock piles of all of these materials, but they are fast dwindling, and with every passing month our foreign sources of supply are becoming fewer and less and less accessible. By successive murderous blows, the sons of Nippon have knocked us out of a quarter of our supply of chromite from the Philippines, 95 per cent of our requirements of rubber, 90 per cent of our imports of tin, and practically 100 per cent of our supply of quinine from Malaya and the Netherlands East Indies. Prior to the Pearl Harbor attack we often heard such questions as: "What good is Guam?" "Why defend the Philippines?" "Why must we fight for the Indies?" The reasons must now be clear even to the most complacent.

Few are aware that the Axis by its conquest in Europe and southeastern Asia is now almost evenly balanced against the United Nations in vital raw materials. In fact, the Axis has now every resource that it lacked before the war started. It is hard to realize how dangerously the United States potential of self-sufficiency in strategic materials has tumbled in the course of

SOURCES OF OUR STRATEGIC RAW MATERIALS

VITAL WAR MATERIALS FOR WHICH WE ARE LARGELY DEPENDENT ON IMPORTS



GRAPHIC PRESENTATION OF AMERICA'S PRIME WAR PROBLEM

Special exhibit currently displayed in Stanley Field Hall, showing what materials are considered as "strategic" by the military authorities of the United States. The exhibit is designed to explain in a vivid and easily understood manner the serious existing situation; and to impress upon the public the vital necessity of diverting to effective war efforts such supplies as remain available. The lesson: Civilians must sacrifice so that Soldiers may win.

mankind. The reverses so far suffered are disquieting but were not unexpected. All through history, attackers have had the initial advantage of surprise over the defenders. Rarely, if ever, has an unprepared nation marched to war and to victory without first sustaining losses or without suffering the bitterness of initial retreats, and discouraging and often unsuccessful defensive maneuvers.

This unpreparedness and the resulting tragedy of "too late, too far, and too little" are not difficult to understand. Democracy, unlike dictatorship, is slow and reluctant to encroach upon the peacetime living standard of its people. The will to mobilize the full strength of the nation to bear upon the enemy can hardly be translated into action overnight in a democracy. Fortu-

we should say so reservedly. Industrial plants, skilled hands, technological brains, and the capacity to produce cannot alone guarantee the staggering production goals that must be reached. Machines of war are made from raw materials; the home front of industry must be supplied with raw materials before industry, in turn, can supply the armed forces with their munitions. Steel cannot be made without manganese, or aircraft without aluminum; armor plate requires chromium, and soldiers must have tin; ammunition needs mercury, and high speed cutting tools call for tungsten; tires there will be only if we have rubber, and parachutes demand a supply of silk, or a suitable substitute—and substitutes themselves may depend upon other raw materials which we may lack. The question, then, is:

a brief five months. Such are the vagaries of world economy and balance of power!

The immediate problem confronting the nation is: Can it replenish what it has lost to feed hundreds of hungry furnaces with their daily ration? The answer is not at hand, but when life's great challenges come, they must be met with all the ingenuity that can be mustered. This may not be sufficient, but it will go a long way towards attaining the objective. The age-old saying, "Necessity is the mother of invention," never assumes a more significant role than it does in time of national emergency.

WHERE OUR HOPES LIE

To cope with the situation, a well directed program of exploration for new resources, of search for substitutes, of development of domestic low-grade deposits, and of commercial integration with South America has been launched. The results of these efforts are already considerable. Sizable deposits of tungsten ores—scheelite and wolframite—have been discovered in Idaho and California. These, plus a number of old mines which have been reopened, have upped the production of tungsten to about 10 per cent of the United States' requirements. New technical processes for getting the metal out of low grade ores or concentrating it in a usable form have been developed and are being successfully applied to many a previously abandoned complex ore of chromium, manganese, aluminum and other strategic metals. On the whole, technological attacks in the fields of geology, chemistry and physics are boosting the production of strategic metals to a level hitherto thought to be unattainable. But there is no room for over-optimism. Raw materials cannot be produced at the sound of the bugle, and some of them cannot be produced at any price or in any length of time. It is best to realize that the crisis is on, that the nation is in peril. It is now a race against time. We must get as far toward self-sufficiency in strategic materials as our skill and resourcefulness permit, for upon these materials depends the war's duration and who shall be the victors.

THINGS YOU MAY HAVE MISSED

"Man o' War" Immortalized

Few, if any, race horses ever won such acclaim as "Man o' War." Many people will fondly recall his triumphs this month of May, with the coming of the famous and spectacular Kentucky Derby.

Little known even to people familiar with Field Museum's collections is the fact that this famous horse is immortalized in a sculpture which forms part of an exhibit in Stanley Field Hall. This model of the great horse is displayed not as a memorial to his accomplishments on the turf, but rather to fulfill a scientific function in

illustrating the final step in the evolution of the horse. Man o' War was selected to typify the highest development of modern equine animals, in a series of models showing various stages over many millions of years.

The sculpture of Man o' War is the work of the late Frederick Blaschke, well-known for his sculptures of prehistoric man and animals in Field Museum and other institutions. Mr. Blaschke modeled the horse from life shortly after its retirement from racing, and presented the sculpture, which is one-fifth the actual size of the animal, to the Museum as a gift.

Six principal stages of horse development are shown by the complete exhibit. First illustrated is the "dawn horse" *Eohippus*



RACING HORSE AS SCIENCE SPECIMEN

Sculpture of "Man o' War," famous for his turf records. Used to typify the modern horse in exhibit illustrating the evolution of the family from 55,000,000 years ago. The late Frederick Blaschke made this life study for the Museum.

which lived approximately 55,000,000 years ago, was only about the size of a fox, and instead of hoofs had four toes on its fore feet, and three on the hind ones. This is followed in the series by: *Mesohippus*, a three-toed horse about the size of a collie dog that lived some 35,000,000 years ago; *Merychippus*, a slender-limbed small desert horse with three toes that lived about 19,000,000 years ago; *Neohippion*, an early one-toed desert horse of medium size that lived about 7,000,000 years ago; *Equus scotti*, a large one-toed or single-hoofed horse which appeared about 4,000,000 years ago, and finally Man o' War typifying the modern race horse.

Further details of horse development are illustrated in the exhibit by fossil skulls and feet of the various kinds of horses.

"Although the first known horses occurred in North America, soon spreading to South America, and not appearing in Asia and Europe until later times, they became completely extinct on the American continents in prehistoric times," says Mr. Elmer S. Riggs, Curator of Paleontology. "The modern horses of the western hemisphere are descended from stock imported from Europe, Asia or elsewhere, where the family survived after its extinction here."

SAPPHIRE AND RUBY LEGENDS

BY HENRY W. NICHOLS
CHIEF CURATOR, DEPARTMENT OF GEOLOGY

The ancients used many of the same names for gems which we use today, but often they applied them to different gems than those to which we assign them. In consequence, since it is thus frequently unclear just what gem they meant, it is also uncertain to which gems should be attached various beliefs and legends associated with various names. Furthermore, because they were unable to discriminate between the several mineral species, the ancients often grouped together under one name gems of the most diverse kinds. Hence, in the old accounts whenever some special property is ascribed to one gem, it may well be that it also applied to a number of other gems that at the time were given the same name.

The name "sapphire" appears to be very old—it runs through many languages with but little change. Sapphire in English, it is *sapphirus* in Latin, *zapphiros* in Greek, *sapphire* in Hebrew, *saphirinon* in Chaldean, and, in old Arabic, *sappir*. It did not apply to what we now call sapphire alone but included other blue gems and even such opaque gems as lapis lazuli. In some countries the sapphire was called "hyacinth," the name now given an entirely different gem, and it probably had other names as well. In Roman times the ruby was placed with other fiery red stones such as garnet and some zircons under the name "carbuncle," a name now limited to the garnet.

Both sapphire and ruby were esteemed as stones of good fortune. According to ancient belief the sapphire procured the favor of princes, prevented evil and impure thoughts, and freed one from enchantments. It is such an enemy to poison that when placed in a glass with a spider or venomous reptile it would kill it. It was sacred to Apollo, and later was the symbol of the Apostle Andrew. One ancient author, Epiphanes, claimed that the Ten Commandments given Moses were inscribed on sapphire. The star sapphire was regarded as being a bearer of good fortune, and, in addition, a cure for apoplexy. The Persians believed that the earth rested on a great sapphire and that the reflection from this colored the sky. According to tradition the ruby turns black when danger approaches, and recovers when the danger passes. It is a sovereign remedy for the plague and poisons. It drives away evil spirits and bad dreams, keeps the wearer in health, and cheers his mind. In the East the ruby is a talisman never to be shown willingly to friends. It is considered ominous if a ruby contains black spots.

Among the legends of the light-giving powers of the ruby is the old Talmudic tradition that the only light in Noah's Ark was a carbuncle which may have been a ruby, zircon, or garnet.

Field Museum of Natural History

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promptly of changes of address.

CURATOR C. C. SANBORN RETURNS FROM PERUVIAN EXPLORATION

The Field Museum Expedition to Peru has been completed with the return to Chicago early in April of Mr. Colin C. Sanborn, Curator of Mammals, after nearly nine months of zoological collecting.

Mr. Sanborn obtained some 400 specimens of mammals, approximately 900 reptiles, 300 fishes, 100 birds, and numerous insects. A large part of these were successfully shipped to the Museum through the submarine zone prior to January; the balance of Mr. Sanborn's collections are temporarily stored at Callao awaiting favorable shipping conditions. Mr. Sanborn himself flew from Lima to Miami, Florida.

The collections obtained by the explorer, together with previous collections obtained by the Magellanic Expedition of which he was a member in 1939-40, give Field Museum the largest representation of the fauna of southern Peru that has ever been brought out of that country.

Through the courtesy and hearty cooperation of officials of the Peruvian government, the University of San Marcos at Lima, and the Museo Javier Prado connected with the university, arrangements were made whereby Field Museum will continue to make a specialty of the zoology of Peru, and will have the collaboration of the Peruvian institutions in research projects connected with this subject. Señor Enrique Zuñiga, a member of the Javier Prado Museum staff, spent several months with

Mr. Sanborn in the field, collecting specimens on the southern coast of Peru, in the mountains up to elevations of 16,000 feet, and in the jungles of the eastern part of the country where the explorers had some rather annoying experiences with great swarms of flies and red bugs.

Mr. Sanborn collected many animals necessary for rounding out the Field Museum collection, including two important species of wild Peruvian guinea pigs, and a number of species of small mammals new to science. The expedition was jointly sponsored by Field Museum and the John Simon Guggenheim Memorial Foundation.

Museum Workers Study First Aid

In preparation for possible eventualities due to the war, a group of about thirty Field Museum employees, both men and women, are training for first aid under the direction of an instructor assigned by the Red Cross. Classes are being held at the Museum twice a week for two-hour periods. Employees of the Shedd Aquarium and other neighboring institutions are participating in the same classes.

Albino Natives in Africa

White Negroes and Negresses (albinos) are not uncommon in Africa. Sometimes the albinism is complete, sometimes piebald. The skin is, however, pinkish and not white. In former days, before European control, an albino male was executed at the conclusion of peace terms, following warfare. This was at Onitsha in Nigeria, and there is no evidence to show that the practice was common. There is a record that the Bokongo tribe required an albino or some hair from one before they could form a new branch of a secret society. Some writers refer to albinos being regarded as reincarnations of deceased chiefs. Literature contains references to the matrimonial difficulties of albino males, who are held in disfavor by women. There is an instance of the usual tribal marks, which are incisions in the skin, being denied to an albino.

Staff Notes

Mr. Rudyerd Boulton, Curator of Birds, has been granted indefinite leave of absence from the Museum to accept an appointment to the staff of the Co-ordinator of Information at Washington, D.C.

Mr. A. A. Miller, the Museum's collographer, has retired on pension after long and faithful service to this institution.

Mr. Karl P. Schmidt, Chief Curator of the Department of Zoology, was recently elected president of the American Society of Ichthyologists and Herpetologists, at the annual meeting held in New York. Mr. Schmidt has been honored also by an

appointment as a special lecturer in the Department of Zoology at the University of Chicago. This appointment was recently confirmed for a three-year term by the board of trustees of the university, and becomes effective October 1 of this year.

Dr. Wilfred H. Osgood, Curator Emeritus of Zoology, has returned from his collecting trip in Arizona and California, bringing a number of specimens needed for the Museum collections. While in San Diego he made an address before the annual meeting of the Cooper Club, an ornithological organization of which he was one of the original founders forty-nine years ago.

Mr. Loren P. Woods, Assistant Curator of Fishes, left April 15 for a brief field trip to southwestern Indiana.

Mr. C. J. Albrecht recently returned from a brief visit to the Marineland Aquarium, Florida, where he made studies of living porpoises in connection with his preparation of models of whales and their relatives.

FIELD MUSEUM HONOR ROLL

Now in the Service of their Country:

- Theodore Roosevelt, Trustee—Brigadier-General, U.S. Army.
- Lester Armour, Trustee—Lieutenant-Commander, U.S. Navy.
- Joseph Nash Field, Trustee—Lieutenant (J. G.), U.S. Navy.
- Clifford C. Gregg, Director—Lieutenant-Colonel, U.S. Army.
- Melvin A. Traylor, Jr., Associate, Birds—Private, U.S. Marine Corps.
- Dr. John Rinaldo, Associate, Southwestern Archaeology—Private, U.S. Army.
- Dr. Alexander Spoehr, Assistant Curator, North American Ethnology and Archaeology—Private, U.S. Army.
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- George Jahrand, Guard—Chief Water Tender, U.S. Navy.
- M. C. Darnall, Jr., Guard—Candidates' Class, U.S. Marine Corps Reserve (Officers' Training Course).
- James C. McIntyre, Guard—Private, U.S. Army, Coast Artillery.
- Clyde James Nash, Guard—Chief Gunner's Mate, U.S. Navy.
- Nicholas Repar, Printer—First Class Seaman, U.S. Navy.

IN A CIVILIAN STATUS

Rudyerd Boulton, Curator of Birds
—Staff of Co-ordinator of Information, Washington, D.C.

SOMETHING ABOUT SARONGS

By WILFRID D. HAMBLY
CURATOR OF AFRICAN ETHNOLOGY

Fashion Note:—Despite their latter-day renunciation by Miss Dorothy Lamour of Hollywood fame, who made them a by-word in the American home, sarongs will continue to be worn in the East Indies, Malaya, and elsewhere (including probably even Hollywood). Genuine sarongs, as contrasted with the motion picture varieties, are displayed in Field Museum's Department of Anthropology (Halls F and G—ethnological collections from Polynesia, Micronesia, Malay Peninsula and Malay Archipelago).

War Note:—With the placing of General Douglas A. MacArthur, U.S.A., at the head of all United Nations forces which are to take the offensive against Japan, there is new hope for all of the peoples in the countries and islands with which the sarong has become so closely associated as to be the identifying element in the minds of many Americans.

Ethnological Notes:—Most Americans, however, really know little about genuine sarongs. Chicagoans with distorted ideas, derived from celluloid versions, can correct their information by inspecting the specimens displayed in the Museum.

The term "sarong" is derived from the Malay word "saron." This type of garment is the chief article of dress worn by both sexes in the Malay Archipelago, Ceylon, and some parts of India. It is a long strip of cloth, usually of cotton or of silk, sewed together at the ends and worn as a petticoat tucked around the waist. The name "sarong" is also given to certain kinds of printed European cotton cloth which are exported for making sarongs.

In *Java and the Dutch East Indies*, by A. Cabation, a sarong is defined as a skirt falling from the waist, or sometimes above it, to the feet. When open in front it is called the *kain pandjang*. In Java batik work is for the well-to-do; the poor have their sarongs colored with woven stripes.

To a sarong a man adds a sort of vest of white cotton, or a short jacket with wide sleeves. Women sometimes add to the sarong a wide bandage of blue cloth (called *kembang*) which is wound round the bust, under the arms.

An indispensable article of feminine toilet is the *slendang*, a scarf somewhat over twenty inches wide, often ornamented with fringes. It is colored brown, green, or yellow, or among the poorer classes deep blue. A well-dressed woman wears this for ornament; the women of the people wear it across one shoulder, like a bandolier, and use it for carrying the baby, or for bringing home articles purchased at the market. A Javanese woman is always bareheaded in the presence of men, but she decks her hair with flowers. Both the men and the women go barefoot.

Women of central Sumatra wear a wrap-around skirt, or sarong, which reaches from the waist nearly to the ankles. The sarong is often worn by men outside their trousers but reaches only to the knees. It is often made of cotton with decorative elements in colored silk or gold thread (which may be imitation or real according to the owner's bank balance).

The skirt on the model of a Menangkabau bride, among the Sumatran exhibits in Hall G, may be called a sarong. In Case 16, Hall G, is a royal sarong worn by Sultan Idris of Perak, Federated Malay States, at his last marriage. The design is woven in gold thread by skilled weavers who often lived in the palace.

BATIK DESIGNS FAVORED

Many sarongs are decorated with *batik* designs. In the *batik* process a cotton fabric is covered partially with a thin ground of wax before plunging it into a bath of dye, so as to keep from the dye certain parts of the textile in such a manner as to form a design. This operation, repeated several times in succession, but with a dye of different color on each occasion, and with the stuff recoated so as to preserve different portions from the dye, finally produces a design. Batik work is done by women. Wax, held in a little cup or funnel of copper, trickles through a fine tube and makes designs in warm liquid wax which then hardens. The process resembles the making of icing designs on a wedding cake. When the worker has traced the design in wax upon one face of the cloth, she uses the same means to decorate the other side, so that the stuff has no wrong side, and may be used with either side uppermost. The fabric is then plunged into a dye vat and the dye colors all portions that are not covered with the wax design. The wax is removed by means of boiling water; then, before dyeing again, a second wax design is added. This process is repeated until the design is complete in all colors. Special designs are reserved for certain articles of clothing or for certain persons. A sultan may wear batiks of designs that no other person might dare to wear.

SEEDS USED AS STANDARDS OF WEIGHT AND MEASURE

BY LLEWELYN WILLIAMS
CURATOR OF ECONOMIC BOTANY

From ancient times down to the present, various seeds (especially those of the bean family) and cereal grains have served as standards of weight and measure in widely separated parts of the world. During the middle ages, for example, certain European towns or seats of commercial activity had their own particular unit of weight. In the French city of Troyes, famed for its agricultural fairs, a kernel of wheat was adopted as a standard and this gave rise to the term *troy* weight, the pound troy being equivalent to 5,760 grains or 12

ounces. In the early part of the fourteenth century the troy system was accepted in England and elsewhere for weighing bread, silk, gold, silver and jewelry, but nowadays it is used exclusively in weighing the few precious metals.

BASIS OF AVOIRDUPOIS SYSTEM

In parts of southern France and northern Spain the pea (*pois*) was the acknowledged standard of weight and some maintain that this gave origin to the term *avoirdupois*. This system was introduced into England about the year 1300 for weighing coarse commodities, such as grain, hay, butter, sugar, tea, etc., and is the official standard of weight and measure employed, with some modification, in the United States. A decree promulgated by Edward II of England in 1324 stipulated that "three barley corns, round and dry" define an English inch. Thus a single kernel of barley was regarded as one-third of an inch.

It is generally believed that the original *carat* of jewelers, still in vogue for weighing precious gems, is the equivalent of the tiny seed of the "carob" (*Ceratonia siliqua*), a small leguminous tree growing along the shores of the Mediterranean. Its pods are known as "St. John's bread," from the belief that they constituted the food of St. John while he was in the wilderness; also, because these were the husks cited in the parable of the Prodigal Son. In India, jewelers and druggists employ the seed of "rati" (*Abrus precatorius*), a leguminous plant of twining habit native to Asia but now found in most tropical regions. Each seed is equivalent to slightly less than two grains, and it is stated that the weight of the famous Kohinoor diamond was ascertained on the basis of these nearly globular seeds. On account of their unusual color—brilliant scarlet with a black scar—they are also popular in some countries for necklaces and bracelets.

ORIENTAL STANDARDS

A Persian standard of weight, the *Nukhud*, is equal to $\frac{1}{14}$ of an ounce avoirdupois. It is the seed of the chick-pea, an annual plant cultivated extensively in the Orient and southern Europe for food and in the preparation of sweetmeats. In the Far East the seeds of the red sandalwood tree (*Adenanthera paronina*), of the bean family, are employed by jewelers and goldsmiths as weights, each seed, being remarkably uniform in size, averaging four grains. They also served as an article of food, and their scarlet color adapts them for making ornaments, such as bracelets, necklaces, etc. In the Gold Coast region of West Africa the seeds of "damabo" (*Rhynchosia cyanosperma*), also of the bean family, are said to be utilized for weighing gold dust.

Several of these seeds are on exhibition in Case 835 in Martin A. and Carrie Ryerson Hall (Plant Life—Hall 29); barley and wheat are included among the cereal exhibits in the Hall of Food Plants (Hall 25).

WEEKDAY LECTURE TOURS OFFERED IN MAY

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:

Friday, May 1—The Near East, Cradle of Civilization (Miss Elizabeth Hambleton).

Week beginning May 4: Monday—Animals of Forest and Jungle (Miss Elizabeth Best); Tuesday—General Tour (Miss Elizabeth Best); Wednesday—Springtime in Chicago-land (Mrs. Leota Thomas); Thursday—General Tour (Miss Elizabeth Hambleton); Friday—Veneers and Varnishes (Miss Marie Pabst).

Week beginning May 11: Monday—South America, Its Peoples and Products (Miss Elizabeth Hambleton); Tuesday—General Tour (Mrs. Leota Thomas); Wednesday—Racial Types and Native Life of Certain Contemporary Peoples (Mrs. Leota Thomas); Thursday—General Tour (Miss Marie Pabst); Friday—Life in the Water (Miss Elizabeth Best).

Week beginning May 18: Monday—How the Ancient Egyptians Lived (Miss Marie Pabst); Tuesday—General Tour (Miss Elizabeth Best); Wednesday—Why An Ever Changing World (Mrs. Leota Thomas); Thursday—General Tour (Miss Marie Pabst); Friday—Sources of Materials Strategic to America (Miss Miriam Wood).

Week beginning May 25: Monday—Masks and Medicine Men (Miss Elizabeth Hambleton); Tuesday—General Tour (Miss Marie Pabst); Wednesday—Ways in Which Animals Protect Themselves (Miss Elizabeth Best); Thursday—General Tour (Miss Elizabeth Hambleton); Friday—Plants and Animals Through the Ages (Miss Marie Pabst).

Persons wishing to participate should apply at North Entrance. Tours are free.

Notable Grizzly Bear Specimen

Mr. Francis N. Bard, of Highland Park, Illinois, has presented to Field Museum one of the finest grizzly bears ever shot in North America. This specimen, recently placed on exhibition in Hall 15 where mammals are systematically arranged by families, was taken by Mr. Bard on the Bella Coola River, British Columbia, in the fall of 1938. Really large bears in good coat are difficult to get, and this one is a very welcome addition to Field Museum's exhibits. —C.C.S.

Children from Michigan Are First to Use Enlarged Lunchroom

More than 800 school children from Ottawa County in Michigan, together with some of their parents and teachers, visited Field Museum on April 10. This was one of the first mass groups of children to come from near-by states on spring season pilgrimages to Chicago cultural institutions.

Bringing picnic lunches, these youngsters gave the first test to the Museum's newly enlarged special lunch room for children. Table space for picnickers has been increased by about 20 per cent; the necessity for such enlargement was indicated by the experience of previous years.

LIFE HISTORIES OF THE ANIMALS TOPIC OF SUNDAY LECTURES

"Who's Who in the Mounted Zoo," a lecture which will include stories of the world's animals—the strangest ones in the animal kingdom, as well as those with which everyone is familiar—will be presented by Mr. Paul G. Dallwig, the Layman Lecturer on Sunday afternoons during May. This is an entirely new lecture not hitherto offered



CLOODED LEOPARD

A rare and beautiful member of the cat family, from Asia and the East Indies. Mr. Dallwig gives special attention to leopards in his Sunday lectures during May.

in Mr. Dallwig's repertoire. Mr. Dallwig will use the extensive exhibits of the Department of Zoology to illustrate his talk, which will cover the animals of North and South America, Africa, Asia, and elsewhere.

Because of heavy public demands, it is necessary to limit each audience to 100 adults (children cannot be accommodated). Those desiring to attend must make reservations in advance by mail or telephone (WABash 9410). The Sunday lectures begin promptly at 2 P.M. and end at 4:30. Midway there is an intermission for refreshments and smoking in the Cafeteria.

This is the final month of the current season of Layman Lectures. They will be resumed beginning with the first Sunday next October when Mr. Dallwig will again present "Who's Who in the Mounted Zoo" as the opening subject of a new season extending over six months.

GIFTS TO THE MUSEUM

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

Department of Botany:

From Donald Richards, Chicago—150 specimens of bryophytes and 66 of algae; from Paul H. Allen, Balboa, Canal Zone—25 herbarium specimens, Panama; from José Ignacio Aguilar, Guatemala City—200 herbarium specimens, Guatemala; from Herman Silva, Knoxville, Tenn.—80 specimens of algae, Tennessee and North Caro-

lina; from Lawrence J. King, Chicago—21 specimens of algae, Illinois; from Professor Angel Maldonado, Lima, Peru—68 specimens of algae, western Peru; from University of California, Berkeley, Calif.—2,280 specimens of algae, chiefly California; from United States National Museum, Washington, D.C.—444 specimens of algae.

Department of Geology:

From E. D. Goldring, Cowdrey, Colo.—4 specimens of ilsemannite, Colorado.

Department of Zoology:

From Dr. Louis B. Bishop, Pasadena, Calif.—378 bird skins; from Clyde T. Reed, Gregory, Tex.—419 fish specimens, 78 salamanders, toads, and turtles, 202 specimens of marine shells comprising 20 lots, and 323 specimens of marine crustacea comprising 29 lots, Texas; from Dr. Wilfred H. Osgood, Chicago—58 mammals and 2 birds, Arizona; from Dr. B. E. Dahlgren, Chicago—a toad and a scorpion, Cuba; from Henry S. Dybas, Chicago—14 land shells and 10 bugs, Chicago area; from Chicago Zoological Society, Brookfield, Ill.—3 reptiles, 6 birds, and 2 mammals; from Dr. Leslie Hubricht, St. Louis, Mo.—a cave salamander, Missouri; from Dr. Edward McC. Callan, Trinidad, British West Indies—a snake, a lizard, a frog, and a series of tadpoles, Trinidad; from George R. Campbell, British West Indies—4 snakes and a lizard, Trinidad; from American Museum of Natural History, New York City—11 South American rodents, Colombia; from Gordon Pearsall, Maywood, Ill.—a mink, Illinois; from Professor Angel Maldonado, Lima, Peru—75 specimens comprising 5 lots of fresh water invertebrates, Peru; from Dr. Fritz Haas, Chicago—a red-throated loon, Illinois.

The Library:

Valuable books from William H. Phelps, Caracas, Venezuela; G. P. Putnam's Sons, New York City; and Solomon A. Smith, Dr. Fritz Haas, and Henry S. Dybas, all of Chicago.

NEW MEMBERS

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

Associate Members

Miss Elizabeth G. Dimmer, Fred R. Eiseman, Mrs. Louis Goldman, W. S. Holabird, Jr., Basil Maxant, Willis D. Nance, John A. Obermaier.

Annual Members

Hugh R. Adams, Jr., Harold C. Adsit, N. J. Aschermann, Miss Maude F. Back, Joseph D. Bietz, John H. Carroll, Jr., Milton S. Carstens, Dr. Joseph S. Drabanski, William M. Hammond, John A. Kahoun, Samuel Laderman, Charles Luckman, J. H. Mehan, Carlton R. Merrifield, Miss Elsa v. Winckelmann Miller, Alfred R. Nilson, Nino J. Persello, Samuel S. Reid, O. A. Rochlitz, Sidney M. Spiegel, Jr., Irving E. Teitelbaum, Dr. Richard J. Tivnen, William Vilsoet, Dr. D. A. Vloedman, Arthur L. Wanner, Willis C. Ware, F. Harris Wells, Ross Whitney, C. S. Young.

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UNIQUE EXHIBITS FROM MADAGASCAR, GUARDIAN OF AMERICAN SUPPLY ROUTES

By WILFRID D. HAMBLY
CURATOR OF AFRICAN ETHNOLOGY

A recent British landing, and an American declaration of the vital importance of ocean routes around South Africa, have made the name Madagascar familiar in every home. Newspaper articles and maps have shown the island to be a bastion of both the east coast of Africa and the vast expanse of ocean between that continent and India. For this reason the Allies have for a long time been fearful that this strategic position might fall into the enemy's possession.

As far back as 1925, Field Museum realized the scientific importance of this vast territory, and at that time appointed Dr. Ralph Linton, then a Field Museum curator, as leader of the Marshall Field Anthropological Expedition to Madagascar. The collection of ethnological specimens made through this enterprise, and now on display in Hall E, has become world-famous, and is unique among museum exhibits in the western hemisphere.

The island of Madagascar is of enormous size—975 miles long—and its area is 227,750 square miles, or nearly as large an expanse as the state of Texas. The ocean channel separating Madagascar from the mainland of Africa is about 240 miles wide at the narrowest point, and this fact might suggest that the peoples, languages, and cultures, as well as the plant and animal life, would most closely resemble the near-by African types. This, however, is not the case.

MALAYAN INFLUENCE INDICATED

The various tribes of Madagascar, so thoroughly described in Dr. Linton's publication *The Tanala, a Hill Tribe of Madagascar*, published a few years ago by Field Museum, have in their appearance, languages, and

cultures, much closer affinities with Indonesia and Polynesia, thousands of miles distant, than with adjacent Africa. There is, of course, some Negro and Arab influence, especially from the east coast of Africa, and Arab navigators touched Madagascar at very early periods of uncertain date, but the main influences must be sought in far

the development of better social and economic conditions, for the native peoples are proud of their large herds of cattle; and many crops, especially such staples as rice, manioc, sweet potatoes, beans, ground-nuts, yams, cotton, sugar cane, coffee, tobacco, and hemp, require scientific development.

Much of the interior is covered with densely wooded mountain ranges rising to a height of 9,000 feet. From these flow numerous rivers, but their courses are so broken by gorges, cascades, and rapids that navigation is considerably hampered. There is, however, one river that can be ascended by light steamers for a hundred miles. The mineral wealth includes deposits of iron, gold, lead, copper, and coal.

Dr. Linton speaks of the hot and humid climate of the eastern coastal plains where rainfall is an almost daily occurrence, and fever takes a heavy toll of European and native lives. The plateau is character-

away Malaya. The common use of large outrigger canoes along the east African and Madagascan coasts suggests that these vessels, which are so like their Indonesian counterparts, were responsible for many daring voyages from the Malay Peninsula and Indonesian Islands.

In the year 1896 Madagascar was declared a French protectorate, and considerable advance has been made in constructing roads to accommodate bus services, and in building railway lines, the longest of which connects Tamatave, chief port and capital, with Antananarivo, the ancient capital, over a distance of 229 miles. Numerous schools of Catholic and Protestant missions exist, and free elementary education has been fostered. Schools of animal husbandry and of agriculture are of extreme importance in

ized by a rather dry, temperate climate with a moderate seasonal rainfall. On the western slope of the plateau, and on the extreme south, the climate is hot and dry. People of the east coast are mainly fishermen and agriculturists, with little dependence on cattle. Those of the plateau are mainly agricultural, but possess some herds of importance. Tribes of the south and west subsist almost entirely on their herds.

To visit these various tribes involves many long and arduous journeys over difficult terrain. For this purpose a native contrivance known as a *filanzana* is frequently used. This consists of a precarious seat fixed between two ten-foot poles, the four ends of which rest on the shoulders of four bearers, who necessarily must be men of considerable strength. The Malagasy porters



MADAGASCAR'S MOST FAMOUS PLANT—"THE TRAVELER'S TREE"

Rain water which gathers in the leaf axils of this exotic tree (*Ravenala madagascariensis*) is supposed to be a boon to thirsty wanderers, although actually it probably would be found to be warm and infested by a variety of small unpalatable aquatic life. Illustration reproduces a mural painting, in Hall 29, by the late Charles A. Corwin.

carry all of the baggage on their heads in loads of about fifty pounds each.

PLANT LIFE

The interests of Field Museum have been by no means confined to subjects of ethnological importance. In Martin A. and Carrie Ryerson Hall (Hall 29—Plant Life) is a beautiful mural painting, by the late Charles A. Corwin, former Staff Artist, showing one of the trees which arrest the



MALAGASY SATIRE

"Beauty from Paris"—native artist's carved wood caricature of the much disliked wife of a white colonial official.

natives in search of rubber, is mentioned by Charles F. Swingle of the United States Department of Agriculture, in his excellent article on exploration in Madagascar (*National Geographic Magazine*, vol. 56, 1929). He brought some living *Intisy* plants home to Washington, and states: "The whole southern section of the island, particularly that in which I found *Intisy*, is similar to our own Southwest. This allows us to hope that *Euphorbia intisy* will prove a profitable rubber producer in parts of Arizona and California."

MADAGASCAR ANIMALS

One might assume that the animal life of Madagascar would bear very close resemblance to that of Africa. But the elephant and the lion are lacking from island life, and the constrictor snakes are boas which are related to the South American constrictors (Hall 18) rather than to the pythons of near-by Africa. There has been much speculation about the possibility of ancient land connections of Madagascar which have long since submerged, but have nevertheless allowed the preservation of some ancient forms of life that were once widely distributed. The lemurs of Madagascar (Hall 15) are peculiar forms of mammals, of diverse size and coloring. Their anatomy has been of considerable interest to zoologists and anthropologists because of features suggesting that they played a part in the early evolution of the human form. They are dusk-to-dawn animals which exist in the trees and seldom touch the ground.

A visitor interested in Madagascar should be careful not to miss the exhibits in Hall 21

where a case of casts illustrates the forms of giant extinct birds. The elephant birds (*Aepyornis*) of Madagascar were the largest and most massive birds that ever existed, and some of them did not become extinct until a few thousand years ago. Individuals were as much as eleven feet tall, and the egg, of which a model is displayed, was equal in volume to 183 hen's eggs.

ARTS AND HANDICRAFTS

Visitors who are most interested in the native population of Madagascar will be delighted with the rich display of arts and handicrafts displayed in twenty-six large cases that occupy Hall E on the ground floor. Of exceptional rarity and value are the examples of Sakalava weaving with raffia fiber (Case 22). Young leaves of the raffia palm are dried and shredded, and the filaments are then tied to form a continuous thread. Designs are dyed into the warp thread of the fabric before it is woven, and



RUFFED LEMUR OF MADAGASCAR

Lemurs are more primitive than other primates, being a relatively unmodified descendant of one of man's early ancestors. "True lemurs" are found in Madagascar, and a few others inhabit Africa and the East Indies.

the parts which are not to be dyed are tied with raffia so tightly that the color cannot affect them. To produce these remarkable examples of the weaver's craft, with decorations mostly in geometrical patterns, the dyer works from memory.

Examples of weaving in silk by the Imerina and Betsileo tribes are shown in Case 6. These articles are woven on crude hand looms from silk which is sometimes obtained by collecting the cocoons of moths. There is, however, a domestic industry in which the caterpillars are kept at home. After the cocoons have been spun the larvae are removed and eaten, then the silk is unwound for industrial use. Thus the caterpillar serves a double purpose.

Mats, baskets, and pottery are gathered here in rich profusion. Remarkable examples of the blacksmith's craft in the form of giant candelabras of elaborate design are shown in Case 25. These are the work of Betsileo artisans.

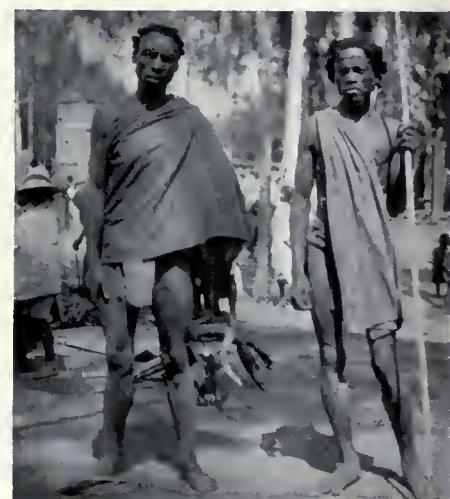
Case 20 contains a selection of ornaments of gold, silver, and coral, and in Case 27 there is an attractive display of modern

arts of the Imerina, who, guided to some extent by European influence, have produced excellent articles of carved woodwork, horn, and basketry, together with hand-painted designs. The carved wooden posts and panels of the Imerina and Betsileo tribes have great artistic merit (Case 9).

For information on those social and spiritual matters which cannot be well illustrated in cases one must turn to the pages of Dr. Linton's publication, previously mentioned. There he describes the strange cult based on a belief that souls of the dead, particularly of important chiefs, can return to earth in the form of giant snakes (boas).

To the important subject of matrimony, Linton rightly devotes several pages. The information relates to courtship and arrangement of the nuptials. He states that "romantics are usually considered fools," and in arranging marriages economic considerations seem to be uppermost in the minds of even the young people. "In general a man is content if he gets a wife who is strong and industrious, while a woman is satisfied with any hard-working husband, the richer the better. Only ordinary congeniality is expected. What little romance there is seems to be practically limited to first marriages. Plural wives are taken on purely economic grounds, and have to pass the scrutiny of the first wife."

Madagascar is a land of many problems, not the least of which are archaeological. The huge stone monuments are not yet explained, and a great field for excavation awaits the archaeologist. Many conspicuous modern monuments are memorial stones. One observer has said that the Malagasy devotes more time to his tomb than to the erection and improvement of his house, because he knows he will pass a much longer time in the former.



MEN OF THE BARA TRIBE, MADAGASCAR

Although their island home is a close neighbor geographically of Africa, these primitive people apparently are of Malaysian racial origin. They are believed to be the descendants of daring voyagers who traveled thousands of miles by outrigger canoe, from Pacific regions.

NUMEROUS FOSSILS COLLECTED BY HONDURAS EXPEDITION

By PAUL O. McGREW
ASSISTANT IN PALEONTOLOGY

Reasons for going to the Republic of Honduras in search of fossil mammals are manifold. Evidence bearing directly on many important paleontological problems might be obtained from the study of fossils from that country. For example: Just when did land emerge and reconnect long-isolated South America with North America, making it possible for animals of one continent to migrate freely to the other? What effects did the mountains and tropical conditions have on plains animals that migrated southward into Central America? Did some mammals that became extinct a million years ago in North America survive much longer in the Central American tropics? Did the tropical conditions of Central America form a barrier that stopped the migration of certain mammals into South America? Is it possible to use the same paleontological criteria for dating ancient deposits in the tropics that we use in the more temperate North? It was to answer part of these questions that the recent Field Museum Paleontological Expedition to Honduras was planned.

Mr. Albert A. Potter, of Nebraska State Teachers College, Chadron, Nebraska, and I left Chicago for Honduras on November 2. In Gracias we obtained the services of Señor Eliseo Carabantes as guide and general assistant, and one Doroteo Mendes as general camp man.

Our first camp was some five kilometers north of the town of Gracias, a simple town of some 2,000 inhabitants, near the Rio Mejocote along whose valley for some twelve kilometers are exposed rocks of early Pliocene age. It was these exposed sandstones and clays that were to occupy our attention for some three months.

Our efforts in the Gracias region produced fossils of extinct genera of rhinoceros, horse, camel, dog, mastodon, deer, turtle and other forms as yet unidentified. Of these, the dog, turtle and deer appear to be new to science. The horse, of which we obtained a particularly good collection, is of special interest because of its diminutive size. It is only about half as large as its counterpart in the American Plains. Presumably this dwarfing resulted from migration into an unsuitable environment. Just why a typical plains animal such as the horse would migrate into mountainous tropics is a bit hard to understand, but it seems that overpopulation in the more suitable regions drove the southern peripheral individuals continually southward.

Another fact of interest is that every form found in this Pliocene locality was of northern origin. This certainly means that there was no full scale penetration from South America, and that North and South

America were at that time still separated by a marine portal.

"A FOSSIL JACKPOT"

With work finished in the Gracias region we reluctantly bid our friends of the town adios, packed our fossils and belongings on a train of mules, and set out northward in pursuit of more fossils. We had heard rumors of fossils in the Department of Copan near the town of Dulce Nombre. Some twelve kilometers north of Dulce Nombre a small creek had cut into an ancient mud deposit exposing bones of such size that they could not fail to excite the local people. First glance at the mud hole proved that we had "hit the jackpot." Scattered about the creek bed were dozens of great bone fragments, and protruding from the mud was the skull of a great ground sloth, *Megatherium*, along with other bones. Without further hesitation camp was set up near the spot that was to be our home for most of the next two months.

Although a terrifically messy job, working day after day in malodorous mud up to our knees, digging in this new locality was far from disappointing. The excellent preservation and quality of the bones dispelled all thoughts of the discomforts. Work went smoothly for about a month and a half, and then each day brought increasing difficulties. From the beginning we had trouble keeping mud and water out of the quarry as it was continuously seeping out of the quarry wall. By the time we had some twelve feet of overhead our shovels were inadequate to cope with the problem. Finally more mud would come into the quarry than we could possibly move, and we regretfully abandoned the quarry.

The fossils from this mud hole were of Pleistocene age and were of mammals of both South and North American origin. From the south were bones of the giant ground sloth *Megatherium*, of the Toxodont (a massive and unique extinct form), and of Glyptodont, a giant armadillo-like animal. From the north were horse, camel, and puma. Other forms are represented by specimens as yet unidentified. These occurrences represent the most northern record known of the South American *Toxodon*, and, on the other hand, the most southern record of the camel (*Camelops*).

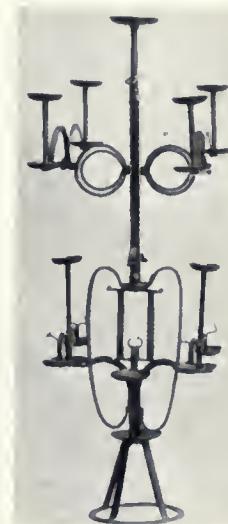
We crated and packed our fossils carefully and transported them by mule to the border town of Copan, and from there by truck to the railroad in Guatemala, then returned to Chicago by plane and train late in April.

One of our most pleasant memories of the work in Honduras is that of the friendly co-operation so generously offered by all of the people we met within its borders. The government officials courteously paved our way for a pleasant and successful expedition, giving us every assistance. Honduras is one of our allies, having declared war on our Axis enemies, and the people are enthusiastically pro-United States.

THINGS YOU MAY HAVE MISSED

Madagascar Tribal King's Lamp to Signal Chiefs and Wives

One of the last kings of the Betsileo tribe in southern Madagascar had an ingenious method of signalling to indicate just what royal prerogatives he wished to exercise on any particular evening. This was done by means of a special stand holding a number of lamps. If he craved complete solitude, he lighted a single lamp at the top of the stand, and no one, man or woman, would then dare approach his habitation. If he desired the company of any special wife, he lighted the lamp assigned to her exclusively; if he wished several wives to visit him together he lighted the lamps of all of them. Similarly, if he felt the need of conferring upon affairs of state with any one or several of the divisional chieftains of his tribe, he lighted the lamps designating the man or men he wished to see.



GADGET FOR A KING
IN MADAGASCAR

When top lamp was lighted,
His Majesty wished to be alone;
each lamp in middle tier
was to call a certain chief,
and in lower tier to call a
specific wife.

This royal gadget is now on exhibition in Hall E at Field Museum, as part of the notable Madagascar ethnological collection obtained by the Marshall Field Anthropological Expedition to Madagascar, led by Dr. Ralph Linton, former member of the Museum staff.

The lamps are iron cups which were filled with grease and equipped with a wick. These lamps are suspended on a tripod-like stand. The lamp denoting the king himself, in which a flame meant he was not to be disturbed by anyone, is at the top of the stand; below this is a tier of four lamps for each of the chieftains of the tribe's four principal clans; and farther down are five more cups designating the king's five wives. Jealousy, if it existed, certainly had to be suppressed by these consorts, for just as a woman was preening herself in congratulatory self-esteem on having been called, she might see the lamps of one or more of her sisters of the harem also flaring forth their light. The king, perhaps, would have found it easier to go calling, or to send a courier with his messages, for in order to light his lamps he had to resort to the primitive method of rubbing sticks together until the friction brought fire.

EXHIBIT SHOWS VARIED ANIMALS THAT INHABITED THE BAD LANDS 25,000,000 YEARS AGO

BY ELMER S. RIGGS
CURATOR OF PALEONTOLOGY

An exhibit recently added to Ernest R. Graham Hall (Hall 38) at Field Museum consists of remains of fossil mammals from a zone in the Oligocene Bad Land formation, estimated to be twenty-five million years old. The purpose of this display is to demonstrate that many kinds of mammals in that age had attained the structural characteristics and the habits evident in families of mammals living today.

The exhibited specimens include skulls and skeletons of animals that lived on plains centered about the group of mountains



Drawing by Hansen (modified from Bruce Horsfall)

GIANT PIG-LIKE ANIMAL

Archaeotherium mortoni, a precursor but not a direct ancestor of the modern hog. Some of these creatures grew to the enormous size of an American bison.

known as the Black Hills and extending into the Dakotas, Nebraska, Colorado, and Wyoming. The locality, commonly known as the South Dakota Bad Lands, is famous for having produced, in large numbers for most species, a great variety of especially interesting prehistoric mammals.

The Black Hills region in Oligocene time evidently consisted of a series of fertile and well-watered plains. Vegetation there is known to have been abundant. Some thirty species of extinct deciduous trees have left fossil remains in various localities of North America. Many of these may have lived in the Black Hills district, but conditions were not so favorable for fossilizing and preserving them as for preserving the remains of animal life.

In Oligocene times, streams ran swiftly down the mountain slopes, carrying their burden of sand and clay out over the adjacent lowlands. Volcanoes threw out volumes of ash and dust, and the winds spread and sifted these over the surrounding plains. At flood-time streams gathered up the ash and clay sediments, sorted them, and carried them to be dropped in layers over their wide valleys or flood-plains. Thus, layer upon layer, the valleys and the plains were built up. The animals that lived there in great numbers are now known from their skeletons, found near the watering places or distributed over the open plains, where they were covered and preserved by

the accumulating sediments and wind-blown ash. As the ground level was continuously built up, the level of ground waters rose, covering the animal remains and sealing them against the decomposing action of the air, thus contributing another condition essential to the adequate preservation of the bones as fossils.

In the course of time the streams, having built up layer upon layer a series of sediments to a thickness of nearly 400 feet, ceased further depositing of their clays. The volcanic ash continued to drift on the winds, probably at longer intervals and at a diminishing rate as the neighboring volcanoes became less active, and wind-borne sands from the shallow channels of rivers to the south drifted over the region. So there entered another stage in the history of these plains.

BARED AFTER MILLIONS OF YEARS

We pass over the happenings of two long geological epochs. The rivers which flowed eastward across the plains of Dakota and Nebraska had by this time turned into destructive agents. They were now cutting away the plain which is underlain by more than a thousand feet of sediments that had been so gradually built up. In time the streams cut their way through the layers of later sands and deep into the underlying ash and clays on the lower slopes of the Black Hills. In turn these lower clays were cut and furrowed by valleys and by lesser stream channels into the myriads of hills and ridges which today characterize these well-known Bad Lands. As the clays were washed away, the fossil bones and skeletons, which had been buried and preserved in them for nearly twenty-five million years, appeared one by one at the surface. Scientists were enabled to see and recognize them as fossils. Their great abundance and splendid state of preservation became a great boon to paleontological knowledge.

The process of erosion and denudation is still going on as it has ever since the period of glacial erosion. The Cheyenne River which flows close about the southern base of the Black Hills and northeastward along the margin of the big Bad Lands of South Dakota is still a turbid stream at flood-time, heavy with sediments. Its companion stream, the White River, takes its name from the whitish Bad Land clays heavily mixed in its waters. These rivers are still carrying away the sediments which the waters of every rain and every melting snow bring down from the steep slopes of the Bad Lands. This process continuously lays bare the fossils, just as it has been doing for many thousands of years.

EXTINCT RELATIVES OF MODERN ANIMALS

The specimens in the new Museum exhibit are from the middle stage of the White River Bad Lands, a geological horizon

which has received the name of lower Brule clays. They have been selected from the most abundant fauna of the epoch in order to show the great variety in structure and in habits that mammals had then attained. Many belonged to families well known at the present time. Among these are the horses, rhinoceroses, and tapirs, the camels and peccaries, the dogs, cats, and weasels, the rabbits, squirrels, and opossums—eleven well-known families. In addition to these surviving families there are others which flourished for a time and died out. One is a primitive kind of flesh-eater, the *Hyændon*, which was the last remnant of a great group of flesh-eaters that had played a prominent part in the earlier mammalian history of North America and that survived somewhat longer in the Old World. There is also a member of a numerous but extinct family, the merycoidodonts, which became one of the most numerous of all North American mammals. They survived in the Great Plains region for several million years, not migrating to any other continent, and finally died out entirely before the approach of the Glacial Period.

Mammals of almost all habits common to dwellers of lowland and plain are among those of middle Oligocene time. There were: the heavy-bodied river rhinoceroses, similar to the modern hippopotamus in habits; the lighter-bodied upland rhinoceros, and the swift-footed or cursorial rhinoceros, an animal very similar in structure of body and limb to the three-toed horse, (though the head was distinctly rhinoceros-like). There was the tapir of lowland habits, living not very differently from the tapir of today. There were gregarious animals such as the merycoidodonts and the peccaries; also, larger and more solitary animals such as *Archaeotherium* and others



Drawing by John Conrad Hansen

LARGE DOG OF OLIGOCENE TIME

Daphaenops vetus, a canine beast of 25,000,000 years ago. It was more closely ancestral to the modern wolf than to any of our familiar domesticated dogs.

of his family, feeders on roots and tubers. Along with them are found the more active grazers of the upland, including the early horse and camel, as well as a variety of small, gazelle-like animals—slender and timid little creatures that depended upon concealment as well as swift-footedness to protect them from their enemies. The carnivores are represented by dogs of two distinct

kinds, by little weasels, and by larger and smaller sabertooth cats of several species. Harboring and burrowing animals are found in the rabbit, the squirrel, and a small species of insectivore.

These and their contemporaries formed a varied and a well-balanced community of mammals in middle Oligocene time. They had acquired most of the habits of living and of feeding found among land mammals of the present day.

Some of the descendants of these animals migrated to the Old World and introduced the stocks of horses, camels, and rhinoceroses to the wide plains and valleys of Europe, Asia, and Africa. Others crossed over the narrow connections with South America and brought to that continent the stocks of horses and lamas, of tapirs and rodents, of fox-like wolves, and the larger cats which gave to that continent in later times a more cosmopolitan phase of mammalian life than it had previously enjoyed.

All of this bears unmistakable evidence that North America was a fertile breeding ground for many sturdy races of mammals which have developed and maintained their existence in this favored part of the earth through millions of years.

VENEZUELA JUNGLE REPORT FROM MUSEUM EXPLORER

(Editor's Note:—Somewhere in the deepest and most remote parts of the Venezuelan jungle, Mr. Llewelyn Williams, of Field Museum's botanical staff, is trudging on foot and traveling swift-running, rock-strewn streams in dug-out canoes, in the interests of science. For the first time since he plunged last autumn into the region known as the Venezuelan Guiana, he has reached an outpost of civilization from which to send a report to Lieutenant-Colonel Clifford C. Gregg, Director of the Museum. After sending his report, from which excerpts follow, Mr. Williams immediately departed into the jungle again, this time in a different direction, along the upper reaches of the Orinoco River.)

BY LLEWELYN WILLIAMS
CURATOR OF ECONOMIC BOTANY

After a long and arduous trip I am able to report that we managed to bring to this point a large collection of plant and wood specimens, as well as other forest products. This was accomplished without mishap despite the many rapids that were negotiated, the frequent heavy showers experienced, and inadequate transportation.

We left Puerto Ayacucho on January 17, traveling overland to Sanariapo, above the dangerous rapids of Atures, thence along the Orinoco River to San Fernando de Atabapo, and then followed this stream (Atabapo) to its headwaters. From Yavita, on the Temi, after making collections, we traveled overland to the River Pimichin, and down this stream until we reached the Guainfa, which forms the source of the Rio Négro. Collections were made along the Guainfa from the Colombian border to the Brazilian frontier. In addition, excursions

were made along the lower Casiquiare, the stream San Miguel flowing diagonally in the direction of the upper Casiquiare, and the forest flanking the Yavita-Pimichin trail.

The material assembled at the various centers was embarked in large dugouts, *falcas*, with roofs made of palm leaves to protect the specimens from the heat and rains. The entire cargo, forming 40 loads, was then transported overland by Indians from Pimichin to Yavita, at which point several canoes were obtained and other Indians hired for the journey downstream to San Fernando. Here we transferred the cargo into larger boats, able to withstand the strong currents and rapids of the Orinoco, to Sanariapo, thence overland to this place. With the exception of three brief spells of fever I managed to keep good health throughout, despite the fact that we had to take with us all the food necessary for myself and the peons.

RUBBER TREES ABUNDANT

The region studied is one of the most interesting, floristically, of the entire territory. It is estimated that seven-eighths of its entire area is covered by rain forests of tall trees and a wide variety of palms. One of the most notable features of these forests is the abundance of latex-yielding trees, chief of which is rubber (*Hevea*), represented by several species, followed by chicle, masarandy, balata, uququirana, marima, etc.

Plants furnishing fibers are also especially well represented, the principal one being the *chiquichiqui* palm, known in Brazil as *piaçaba*; its fiber is durable in contact with water and almost incorruptible when placed in the ground, being especially suitable for brooms and tow ropes. Another fiber furnished by a palm is *cumuare*, from the young leaves of which the Indians remove a fine, tough, yellowish fiber, greatly esteemed for making hammocks. The fiber is sometimes dyed black or dark brown with the crushed leaves of a plant of the trumpet creeper family. The color, being indelible, holds indefinitely and is not affected by the action of climatic elements. Another useful fiber is *curagua*, obtained from the leaves of a plant of the pineapple family, and employed principally in the making of fishing lines and nets.

Many woods are encountered in these forests. They range from the heavy *parat*ure, a leguminous species with a rich reddish brown heartwood, to the light-colored *palo de boyo*, almost as light as balsa-wood, and used by the Indians for rafts and for fishing floats.

INDIANS AND THEIR CUSTOMS

The region is inhabited almost entirely by Indians, of which there are many tribes, the principal ones being the Baniba, the Piapoco, the Puinave, the Guahibo, the Kuripako, the Karros, the Uarekena, and the Baré. The Baniba are excellent woodsmen and expert tree climbers. Most of the Indians are nomadic in habits, and during

the dry months they travel far in search of game and fish.

In Maroa I had occasion to witness a typical Indian festival, an event to offer thanksgiving for the catch secured during the dry period. The festival is held in the middle of March, shortly before the rainy season begins. The principals, the *lluz* (chief), *mardomo*, *mardoma*, etc., are selected the year before and when the festival is inaugurated these persons set up two posts, known as *mastres*, laden with fruit. On the last, or ninth day, the retiring officers offer a feast to the newly-appointed officials, the meal composed mostly of manioc and cassava, prepared from yuca roots, which constitute their staple food. Fish and game meat are also eaten. At sunset on the same day the fruit-bearing posts are felled, each woman holding office giving a blow with an ax, followed by the men, and the job is finished by the chief.

In the upper Guainfa the Kuripako Indians hold a feast, known as *dabukuri*. This ceremony takes two forms: an offering of certain articles, such as fruit, fish, or canoe paddles, or dances in which the young men are subjected to lashing with a long whip made of vine, to the accompaniment of music played on the *yapururo*, a long instrument made from the hollow stem of the *mavi* palm.

I intend next to leave on the second stage of the explorations, to collect around Tamatama, at the bifurcation of the Orinoco and the upper Casiquiare, where *Herea* rubber trees are said to abound. Thence I will proceed farther up the Orinoco, and also along the River Padamo, before returning downstream to reach the Ventuari region and the mountain ranges in the area traversed by the Sipapo River.

NESTING BIRDS

and the Vegetation Substrate

This is an informing little book dealing with the common birds of the Chicago area and their relation to the plant communities in which they nest.

Written by Mr. William J. Beecher, Assistant in the Department of Zoology, it is an account of eight years' study of the nesting birds of the Fox Lake region near Chicago.

"This book is highly recommended to local bird students," says Mr. Emmet R. Blake, Assistant Curator of Birds, "but the basic principles illustrated by the data make it equally valuable elsewhere." Illustrated with an aerial photograph, and text figures. \$1.

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

BON VOYAGE, COLONEL GREGG—

The Director of Field Museum, Lieutenant Colonel Clifford C. Gregg, who has been on active duty with the United States Army since September 1, 1940, in the Adjutant-General's Department at Sixth Corps Area headquarters in Chicago, was transferred to another post far from Chicago late last month.

Prior to his departure, a farewell reception was given in his honor in the Museum Library, with the entire personnel of the institution attending. An especially prepared memento book, bound in calf-skin, containing a testimonial of the respect and friendship of every man and woman employed by the Museum, and personally signed with the autograph of each, was presented to Colonel Gregg upon this occasion. Dr. Wilfred H. Osgood, Curator Emeritus of Zoology, and Mr. Stanley Field, President of the Museum, made addresses in connection with the presentation of the volume, and Colonel Gregg responded with a farewell speech.

During the twenty-one months since Director Gregg was called to active service with the Army, he has maintained his



L.T. COL. C. C. GREGG

connection with and interest in the Museum. Day after day, following a full stretch of hard work on his Army duties, Colonel Gregg came to the Museum in the evening and put in further hours of toil in the interest of this institution, as well as many extra-long sessions at week-ends.

Ever since the first World War, during which he was a lieutenant, Colonel Gregg had retained his commission in the Army Reserve Corps, continuing his military studies, and frequently serving in the summer training camps for reserve officers, thus qualifying himself for promotions. At the time of his call to active duty he had attained the rank of major, and in March of this year he was again promoted to his present rank of lieutenant-colonel.

Until Colonel Gregg's return from the war, Mr. Orr Goodson, who has been his assistant for some time past, will serve as Acting Director. Dr. Osgood will temporarily take Colonel Gregg's place as Editor of FIELD MUSEUM NEWS.

Following is the testimonial voicing the sentiments of the Museum Staff at the departure of their Director for the duration of the war:

"To Lieutenant Colonel Clifford C. Gregg

"The entire personnel of Field Museum of Natural History extends its warmest good wishes to you as you leave for active field service to the Nation. You carry with you our pride, our loyalty, and our confidence in your success. We know that the fine qualities you have shown as Director of this institution will continue wherever you go. May you return to us safely and speedily."

—AU REVOIR

Staff Notes

Mr. Karl P. Schmidt, Chief Curator of Zoology, gave the annual lecture before the Illinois Academy of Sciences meeting at the University of Illinois, May 8. His subject was "A Naturalist in the South Seas."

Mr. John W. Moyer, Staff Taxidermist, returned May 1 from a leave of absence for an extended lecture tour.

African Proverbs

African Negroes have many equivalents of American and European proverbs. The Ibo of Nigeria, instead of saying that "Charity begins at home" state that "A man repairs his own house first." Instead of saying "Familiarity breeds contempt" the Ibo say "If you play with a puppy he tears your clothes."

Among proverbs of the Ovimbundu of Angola are the following (the American equivalents are cited in parentheses in each case):

"You can't tie an antelope's head in a cloth, the horns will stick out" ("murder will out").

"A turtle cannot climb on a tree stump, someone has to put it there" (an incompetent man has to be promoted through influence).

"Hot water does not burn a house" (said of a braggart who keeps threatening things he cannot do).

"If you are full of food don't climb on a leopard's back" (means do not be proud and foolish through good fortune).

"I caught some fish but lost my bracelet" (said of a deal which brings small gain and a bigger loss).

Death Takes Mrs. Hackbart, Museum Telephone Operator

Mrs. Adelaide F. Hackbart, who had served Field Museum as telephone switchboard operator since 1920, died on April 25 after a long illness. She will be long remembered for her uniform cheerfulness even under the stress of an extremely busy board.

FIELD MUSEUM HONOR ROLL

Now in the Service of their Country:

Theodore Roosevelt, Trustee—Brigadier-General, U.S. Army.

Lester Armour, Trustee—Lieutenant-Commander, U.S. Navy.

Joseph Nash Field, Trustee—Lieutenant (J. G.), U.S. Navy.

Clifford C. Gregg, Director—Lieutenant-Colonel, A.G.D., U.S. Army.

Melvin A. Traylor, Jr., Associate, Birds—Private, U.S. Marine Corps.

Dr. John Rinaldo, Associate, Southwestern Archaeology—Private, U.S. Army.

Dr. Alexander Spoehr, Assistant Curator, North American Ethnology and Archaeology—Private, U.S. Army.

Bert E. Grove, Guide-Lecturer—American Field Service, in North Africa.

Patrick T. McEnery, Guard—Master-at-arms, U.S. Navy.

John Syckowski, Guard—Chief Commissary Steward, U.S. Navy.

George Jahrand, Guard—Chief Water Tender, U.S. Navy.

M. C. Darnall, Jr., Guard—Candidates' Class, U.S. Marine Corps Reserve (Officers' Training Course).

James C. McIntyre, Guard—Private, U.S. Army, Coast Artillery.

Clyde James Nash, Guard—Chief Gunner's Mate, U.S. Navy.

Nicholas Repar, Printer—First Class Seaman, U.S. Navy.

IN A CIVILIAN STATUS

Rudyerd Boulton, Curator, Birds—Staff of Co-ordinator of Information, Washington, D.C.

Bryant Mather, Assistant Curator, Mineralogy—Civil Service Worker for Corps of Engineers, U.S. Army.

WHAT SNAKES ARE POISONOUS, AND WHERE DO THEY LIVE?

A New Field Museum Exhibit Gives the Answers

BY CLIFFORD H. POPE
CURATOR, AMPHIBIANS AND REPTILES

"Is it poisonous?" Since this is nearly always the first question asked about a snake, Field Museum has placed in Albert W. Harris Hall (Hall 18) an exhibit designed to answer it with regard to any snake found in this country. The installation is timely, as the snakes have now come out of hibernation.

This exhibit includes five colored maps showing the distribution of our dangerous species. Anyone may begin to learn his local poisonous snakes by studying these.

In general, the matter is as simple as this: The western half of the United States harbors nothing but rattlesnakes (and the excessively rare coral snake of Arizona); in the northeastern quarter of the country

but the Arizona species is too small and too rare to be regarded as a menace.

The copperhead, often called "highland moccasin," is an eastern species, two to three feet long, whose bite, though dangerous, is seldom fatal to man. The more dangerous and larger water moccasin, or cottonmouth, lives in or near fresh waters of the southeastern lowlands. The so-called "water moccasons" of the northern states and southern highlands are merely harmless snakes that more or less resemble the true moccasin and are often more vicious than it. No false belief about snakes is so hard to deal with as the conviction that true water moccasons occur in northern states.

The rattlesnakes are divided into two groups, the smaller pigmy species, two in

tion of warm-blooded prey. Another sure way to recognize a pit viper is to find in the front of its upper jaw a pair of long, hollow teeth or fangs which fold backward when the mouth closes; through these the pit viper forces venom into its victims.

The layman often contends that looking for pit or fang is as bad as braving the lion in its den, and asks for recognition points which can be seen at a distance. The rattle of the rattlesnakes can be both seen and heard from a distance. One simply has to become familiar with the general appearance and patterns of the copperhead and water moccasin. The latter's aquatic habits help in its recognition; water moccasons are not encountered far from water, and never in mountains or highlands.

The gorgeous coral snakes, deadly relatives of the cobras, are likewise easily recognized at a distance. It happens that a few harmless species are also banded or ringed with red, yellow, and black so the exact arrangement of these colors in the coral snakes must be learned to avoid undue excitement at the sight of one of its "mimics." In the deadly species the snout is black, the bands of the back cross the abdomen or belly to form complete rings, and the yellow rings are next to the red ones. No harmless snake of this country duplicates this triple arrangement.

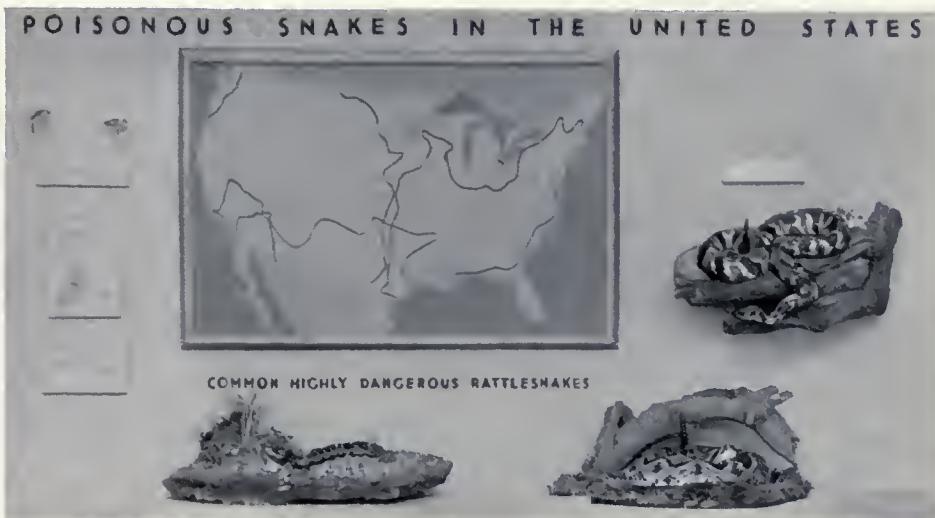
The single species of coral snake that one is at all likely to meet lives in the southeastern states and is usually between two and three feet long. It does not coil and strike like a pit viper, but flings and jerks its slender body about in a manner all its own. The short, rigid fangs are not comparable in efficiency to the long ones of the pit vipers, but the venom itself is extremely potent and attacks the nerve centers rather than the blood and blood vessels. This means that the symptoms of its bite are general rather than local as in the case of the bite of a pit viper.

AID TO FIRST-AIDERS

Many inquiries have recently been received from civilian defense workers attending first aid classes. All those taking such a course will find this exhibit especially helpful. It shows, for example, that only one poisonous snake, the massasauga, occurs in the region of Chicago. A person wearing leather shoes is fairly safe from this pigmy rattlesnake which is locally confined to forest preserves northwest of the city and the dunes at the southern end of Lake Michigan.

In administering first aid to a snake victim, the first consideration is to determine whether the snake was venomous or not. As the Red Cross First Aid Text-book states, "Bites of non-poisonous snakes should be treated as any other wounds," but specialized treatments are required for the venomous ones.

The new exhibit and its maps were designed by Miss Clarice McKeever, volunteer artist, Department of Zoology.



PART OF EXHIBIT OF POISONOUS SNAKES OF THE UNITED STATES

Examples of the reptiles are shown, together with several colored maps indicating the areas over which they are distributed. Labels give the principal points for the identification of dangerous snakes. Thus the problem of recognizing those which are poisonous is reduced to its simplest terms by an elimination process that even a child can grasp.

are only rattlers and the copperhead; in the southeastern quarter are rattlesnakes, the copperhead, water moccasin, and common coral snake.

ONLY THREE DANGEROUS GROUPS

Snake distribution is justifiably emphasized also because the layman, when asked in turn, "Is it poisonous?" invariably recites complicated and useless rules about relative size of head and neck, shape of body, and so on. Even if these rules were good they would scarcely be worth memorizing because only in the southeastern states is the problem involved.

Fortunately, every one of our poisonous species belongs to one of only three types or groups as follows: pit vipers without rattle; pit vipers with rattle; coral snakes.

The copperhead and water moccasin are the sole pit vipers without a rattle, whereas those with a rattle are the well-known rattlesnakes. There are two kinds of coral snakes,

number, and the larger typical rattlesnakes. Although there are thirteen kinds of typical rattlers, only four are common and widely distributed, the rest being confined to the arid and desert areas of the extreme southwest. The combined ranges of the four common kinds cover nearly all of the United States and include at least a part of every state. Any rattlesnake can, of course, be recognized by its rattle.

The bite of a large rattlesnake is a serious matter, so all kinds are to be carefully avoided. The small pigmy species have potent venom, but are not large enough to be fatal to man under ordinary circumstances.

DISTINGUISHING MARKS OF PIT VIPERS

All the members of these first two groups are called pit vipers because they have a deep pit in the face a little below a line joining eye and nostril. This pit, a sense organ stimulated by slight differences in temperature, presumably helps in the detec-

MOTION PICTURES FOR CHILDREN IN JULY AND AUGUST

The James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures will present a summer series of six free programs of motion pictures for children on Thursday mornings beginning July 2 and continuing through August 6. Subjects of the films to be shown will be published in the next issue of FIELD MUSEUM NEWS. The programs will be given in the James Simpson Theatre, and will include films with sound, some in color. Each program will begin at 10 A.M. Children from all parts of Chicago and suburbs are invited, and no tickets are necessary for admission. They may come alone, accompanied by adults, or in groups.

DALLWIG COMPLETES 5th SEASON AS "LAYMAN LECTURER"

On May 31, Mr. Paul G. Dallwig ended his fifth season of Layman Lectures, given as his contribution to Field Museum. During the five years since he inaugurated this activity, he has presented a total of 159 two-hour lectures, with a total attendance of 14,511, or an average attendance of 91 at each lecture.

In the season just closed, November, 1941 through May, 1942 inclusive, the total attendance was 3,294 or an average Sunday attendance of 106 for each of 31 lectures. In addition, there were 920 requests for reservations which could not be fulfilled because of physical limitations on the number that can be accommodated.

In addition, Mr. Dallwig has carried the story of Field Museum to audiences attending programs given by 46 women's clubs and men's organizations, 22 of these outside lecture appearances occurring in the season just closed. Many persons from his outside audiences were stimulated to attend his lectures at the Museum.

Next season Mr. Dallwig plans to start his Museum lectures on the first Sunday in October, and end the series on the last Sunday in April, omitting January from the schedule. Subjects will be announced later in FIELD MUSEUM NEWS.

GIFTS TO THE MUSEUM

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

Department of Botany:

From Harry Hoogstraal, Urbana, Ill.—42 herbarium specimens, Mexico; from Herman C. Benke, Chicago—46 herbarium specimens, United States; from Richard D. Wood, Camp Barkeley, Tex.—139 herbarium specimens, Texas; from Herman Silva, Knoxville, Tenn.—31 specimens of algae, Tennessee and West Virginia; from Dr. M. A. Brannon, Gainesville, Fla.—18 specimens of algae, Florida; from Donald Richards, Chicago—45 specimens of mis-

cellaneous mosses, North America; from H. K. Phinney, Albion, Mich.—61 specimens of algae, Michigan and Texas.

Department of Geology:

From C. Hafer, Candor, N. C.—21 specimens of minerals, North Carolina; from Dr. A. H. Becker, Madison, Wis.—one anorthoclase moonstone cabochon, Wisconsin; from George Huss, Chicago—a fluorite crystal with curved striae, Mahoning Mine, Illinois; from Dr. Frederick W. Burek, Evanston, Ill.—3 moss agate cabochons and a specimen of nephrite jade, California and Wyoming.

Department of Zoology:

From Clyde T. Reed, Gregory, Tex.—32 mammal skulls, an infant human skeleton, and 2 armadillo pelvis, Texas; from Dr. James P. Heath, Kent, Ohio—3 bats, Cuba; from Eugene Ray, Chicago—a beetle (paratype), Indiana; from Dr. Henry Field, Washington, D.C.—a lizard, 8 corals, and 46 shells comprising 9 species, Trinidad, British West Indies; from Dr. Marshall Hertig, Lima, Peru—7 mice, Peru; from Colorado Museum of Natural History, Denver, Colo.—a sage grouse, Colorado; from Robert A. Burton, Evanston, Ill.—195 salamanders, frogs, lizards, snakes, and turtles, Arkansas and Missouri; from Rowland R. McElvare, New York City—8 moths, California; from Henry S. Dybas, Chicago—344 insects and allies, Panama and United States; from Dr. Angelo Maldonado, Lima, Peru—34 specimens of water-bugs, water-beetles, spiders, and dragonfly naiads, Peru; from Chicago Zoological Society, Brookfield, Ill.—36 birds.

The Library:

Valuable books from Americana Corporation, New York City; Mrs. G. C. Walch, Clintonville, Wis.; Dr. Henry Field, Washington, D.C.; and Lt. Col. Clifford C. Gregg, Boardman Conover, Henry W. Nichols, Karl P. Schmidt, and Paul C. Standley, all of Chicago.

NEW MEMBERS

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

Associate Members

Carl Dreutzer, Edward Gray, Lawrence Pucci, Richard A. Trenkmann, Mrs. Edward C. Waller.

Sustaining Members

Peter M. Perry

Annual Members

Albert E. Baddin, Samuel R. Ballis, Charles L. Barr, Fred Biesel, Fredrik A. Chramer, Howard H. Darbo, James C. Downs, Jr., DeForest A. Hamilton, Mrs. Margaret Pope Hovey, Maurice Lazar, J. Lentz, John S. Lord, R. K. Mangan, Earl J. McMahon, Morris Mendelson, Miss Henriette Mertz, M. A. Metzger, Jonas Meyers, Albert A. Miller, Joseph M. Mozeris, Robert A. Rankin, Freeman C. Read, Henry P. Reger, Dr. Leslie H. Reimers, Hayes Robertson, Herman Spertus, Mrs. R. St. John Stevens, Howard H. Wanzer.

WEEKDAY LECTURE TOURS OFFERED IN JUNE

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

Week beginning June 1: Monday—People of the South Seas and East Indies (Miss Elizabeth Hambleton); Tuesday—General Tour (Miss Elizabeth Best); Wednesday—Variety of Animals in North and South America (Miss Elizabeth Best); Thursday—General Tour (Miss Elizabeth Hambleton); Friday—Sugars and Spices (Miss Marie Pabst).

Week beginning June 8: Monday—Men of the Stone Age (Miss Miriam Wood); Tuesday—General Tour (Miss Marie Pabst); Wednesday—Africa's People (Miss Elizabeth Hambleton); Thursday—General Tour (Miss Elizabeth Best); Friday—Game Animals of the World (Miss Elizabeth Best).

Week beginning June 15: Monday—Medicinal Plants (Miss Marie Pabst); Tuesday—General Tour (Miss Elizabeth Hambleton); Wednesday—Indians and Eskimos of Alaska (Miss Elizabeth Hambleton); Thursday—General Tour (Miss Marie Pabst); Friday—Minerals in Ancient and Modern Times (Miss Marie Pabst).

Week beginning June 22: Monday—Summer Life of Various Animals (Miss Elizabeth Best); Tuesday—General Tour (Miss Elizabeth Best); Wednesday—Before the Dawn of History (Miss Marie Pabst); Thursday—General Tour (Miss Elizabeth Hambleton); Friday—Vegetable Oils and Fats (Miss Marie Pabst).

Week beginning June 29: Monday—Life Usually Unseen (Miss Elizabeth Best); Tuesday—General Tour (Miss Miriam Wood).

BY-WAYS TO ADVENTURE, by Edwin Way Teale.

Of this book, Mr. Karl P. Schmidt, Chief Curator of Zoology, says: "Studies in natural history, from the level of the bird-lover or nature-lover, to the scholarly work of a professional ornithological scientist, offer inexhaustible opportunities for hobbies and even life-long avocations for the amateur. Books like Mr. Teale's open the door to such studies for children and for amateur students, and thus help to ensure us of future generations of those scientists whose interests entitle them to the name of naturalist. Mr. Teale's lists of recommended books attached to each chapter are an especially important and valuable feature."

On sale at THE BOOK SHOP of FIELD MUSEUM—\$2.75. Mail orders accepted.

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ISLANDS THAT BOUND THE CORAL SEA ARE REPRESENTED IN MUSEUM EXHIBITS

BY KARL P. SCHMIDT

CHIEF CURATOR, DEPARTMENT OF ZOOLOGY

The Coral Sea lies between the Great Barrier Reef off northeastern Australia and the series of archipelagos of volcanic and coralline islands extending in great arcs eastward and southward from the eastern end of New Guinea. Not long ago New Guinea and other islands of the South Seas were no more than romantic names to most of us—synonyms and symbols for the exotic, strange, and unknown. Often enough they were thought to be idyllic havens of peace, offering opportunities for escape from the mad rush of the civilized world into unspoiled, even though sometimes savage, Edens. Now these islands and archipelagos appear in the daily news, headlines have to distinguish between North Ireland and New Ireland, and what Edens may have existed have been invaded by a warfare infinitely more destructive than any waged by their so-called savage inhabitants in the past. We suddenly find that we, or our sons, or brothers, or friends, are likely for some time to be more familiar with remote New Caledonia than with Scotland, with New Britain than with Britain, and with the New Hebrides of the Pacific rather than the Hebrides of the Scottish coast.

Field Museum, with its world-wide viewpoint and its conscious attempt to assemble a knowledge of the life and products of exotic and remote places, has long given attention to the archipelagos of the Coral Sea. These antipodean islands are of very great interest to several of the Museum's

departments, perhaps first and most obviously for their extraordinary variety of native human tribes with cultures essentially at a Stone Age level. They are no less directly interesting to the zoologists for the wealth of the marine life of their reefs, and

whole shipload of ethnological collections. The island tribes have suffered such extensive decline in numbers, and their customs and hand-made products have been so profoundly altered by the impact of civilization during the last thirty years, that much of this collection is now wholly irreplaceable.

A visit to Joseph N. Field Hall (Hall A) which occupies the whole eastern end of the ground floor in the Museum, will bring before one's eyes a series of native cultures noteworthy for an astonishing development of art, as exemplified in design, and applied to every detail of daily life from cooking pots to canoe prows, and from weapons to ceremonial costumes. These islands, grouped together as "Melanesia" (a name based on a Greek root in reference to the black skins of the native inhabitants) exhibit remarkable changes from island to island and from archipelago to archipelago. The native languages are so distinct and so multitudinous that work "boys," assembled from different islands on coconut plantations, converse with each other in the elaborate "pidgin English" (or better "beach English") which has been developed as a *lingua franca* by the trading and missionary whites.

The variety of strange human cultures in the successive island groups is well exhibited in Joseph N. Field Hall. Carved door posts and weird roof ornaments characterize the circular houses of the all but extinct New Caledonian natives. Between New Caledonia, occupied by the Free French and our own forces, and the Solomons, now in the hands of the Japanese, lie the New



CEREMONIAL PROCESSION WITH FEATHER MASKS

Photograph made years ago at Awar, Hansa Bay in northern New Guinea, by the Joseph N. Field Expedition under the leadership of the late Dr. Albert B. Lewis, Curator of Melanesian Ethnology. Four of these masks, ranging from 14 to 19 feet in height, were brought to Field Museum by the expedition and are exhibited, on manikins, in Stanley Field Hall.

for the "living fossils" among their land animals, which bear the stamp of the Age of Reptiles. Their forests form a botanical world still largely unknown, and while geological problems are somewhat restricted by their volcanic nature, the islands themselves are only outliers of continental Australia and New Guinea, which offer fields for exploration which to date have been no more than scratched.

Field Museum's expeditions to the islands north of the Coral Sea began with the Joseph N. Field Expedition of 1904-1908. Under the direction of the late Dr. Albert B. Lewis, for many years Curator of Melanesian Ethnology, this expedition brought back a

Hebrides, now obviously in the tension zone and of utmost importance to us. The New Hebrides, famous in missionary history, are an orphan archipelago of the colonial period, under the joint rule of the French and British. Perhaps the comparison should be with a child of separated parents, for the rule by two European administrations has produced unsolvable problems of labor-management and of colonization. The native New Hebrideans are still a people of strange customs, and still little influenced by white civilization except for a great decline in their numbers. The remarkable dancing grounds, set about with huge vertical drums, are situated in gloomy forest glades, and an almost incredible hierarchy, in which rank is determined principally by the ritual of killing pigs in a ceremonial "pig-cult," dominates the men's secret societies.

THE SOLOMON ISLANDS

The Solomon Islands are famous for savage tribes whose resentment of slave making raids from Australia in former times



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SOLOMON ISLAND NATIVE

Life study by Malvina Hoffman, among the Races of Mankind bronze sculptures on exhibition in Chauncey Keep Memorial Hall of the Museum (Hall 3).

(known euphemistically as "black-birding") still persists as a barrier against the white man. When the Crane Pacific Expedition of Field Museum visited Malaita Island in 1929, I was instructed not to leave the village without escort, and a Solomon Islander was detailed to accompany me on my nocturnal frog hunting expeditions. He turned out to be a kind of prisoner, kept at the government station, who entertained me with accounts of the murder of a tax-collector, in which he had participated in the previous year.

The Solomon Islanders are bold navigators. Their canoes, ranging from a size suitable only for a single child to great war-canoes that hold fifty men, are made



LAE IN HALCYON DAYS OF 1929

Airport in New Guinea as it appeared when visited by the Crane Pacific Expedition of Field Museum. Today, in Japanese hands, it has become an important base for the bombers sent against the United Nations by Nippon.

from hewn planks, lashed together and caulked with the parinarium nut. Strangely enough, outriggers are not used. Their peculiar outlines are well-known to stamp collectors from pictorial postage stamps. The Solomon Island canoes are often elaborately decorated with mother-of-pearl inlay. The Solomons are now in Japanese hands, and it is into this group that the Japanese fleet probably retired from the battle of the Coral Sea.

Northwest of the Solomons lie the still larger volcanic islands of New Britain and New Ireland. These were German colonies before World War I, and have since been under Australian jurisdiction. The ceremonial objects made by the native tribes on these islands reach an extreme of elaboration. Intricate wood carvings are like totem poles with the animal and human figures carved out within them. A "medicine man's" dance costume from New Britain is like a parasol supported by a gigantic praying mantis.

VAST NEW GUINEA

It was twenty years after the notable ethnological explorations of Melanesia by the Joseph N. Field Expedition, that the zoological expedition, under the patronage of Mr. Cornelius Crane, visited the New Guinean region. Sailing in Mr. Crane's brigantine sailing yacht *Illyria*, the considerable scientific staff included Dr. W. L. Moss as physician, Dr. A. W. C. T. Herre, of Stanford University, as ichthyologist, Mr. Walter A. Weber as artist, Mr. Frank C. Wonder (of the Museum staff) as collector and taxidermist, and the writer as leader of the scientific party. A group of Mr. Crane's friends accompanied the expedition, among whom Mr. Sidney N. Shurcliff served as photographer, while Messrs. Charles R. Peavy and Murry Fairbank accompanied us as non-professional aids.

The first landfall of the *Illyria* on New Guinea was at Lae on the north coast, now daily in the war news as one of the principal Japanese bases. There was a commercial airport at Lae in 1929, serving a gold mining region in the interior. There were twenty-

two planes in service at the time of our visit. The village was the usual collection of palm thatched huts, and the construction of the hangars had been adapted from the New Guinean type of structure.

New Guinea, nearly 2,000 miles long, is so vast an island that its animal life has a much more continental character than that of even such near-by islands as the Solomons. Its birds-of-paradise present a high-light of ornithology, a climax of brilliant coloration and bizarre ornament in the bird group. There are other brilliant birds—parrots, kingfishers, and fruit pigeons; cassowaries on the ground, while large hornbills and giant black cockatoos high in the trees add to the impression of a remarkable wealth and variety of birds.



CARVED LOG

or "malagan" from New Ireland, exhibited in Hall A.

Museums, with their world-wide interests, cannot

expand greatly in times of war. It is to be hoped that a return of tranquillity to such far-off islands as those of the Coral Sea may be under a world peace of enduring



TOPSY-TURVY COURTSHIP

The blue bird-of-paradise assumes an upside-down position for its colorful nuptial display, as shown in this Field Museum exhibit. These birds are found only in New Guinea and its neighboring islands.

conditions in which museum exploration, and the internationalism of scientific research, will again flourish.

HAIL AND FAREWELL— A Tribute to Director Gregg

(Editor's Note:—The June issue of FIELD MUSEUM NEWS contained a factual account of Director Gregg's departure for war service. The following tribute, penned by Mr. Karl P. Schmidt, Chief Curator of Zoology, voices the feelings of the Staff in general.)

Through a period of great difficulty Field Museum has maintained the high standards of its exhibition halls, and the steady growth of its exhibits. The researches of its scientific staff have gone forward, and the results have been published. The relations of the Museum with other educational institutions have been developed. A great program of expeditions has been carried on and has contributed vitality and freshness to the exhibition halls, the reference collections, and the research laboratories. These continuing activities are the outward signs of a well-administered institution, forming a real tribute to its Director and its Trustees under whom he serves.

The inward signs of a museum in good institutional health must have been most gratifying to Lieutenant Colonel Clifford C. Gregg at the time of his recent departure for service to the nation. His ability to command the loyalty and respect of his staff had unlocked all doors to him and placed the sum of the staff intelligence at his service. Accompanying respect has been a growing trust and affection on the part of his Museum colleagues. All who have had occasion to "see the Director" have left his office encouraged and determined to

make their best contribution to the Museum. If more difficult times are ahead, we shall face them with courage and optimism as a result of his example.

In the national emergency of a world war, it was singularly appropriate that the first of our staff to be drawn upon should be the Director himself, whose present period of service with the United States Army began in September, 1940. Since that time, various younger members of the staff have been drawn into governmental services. For them, those who remain will carry on "for the duration."

TURTLE "MYSTERY" SOLVED

(A nature lesson, as told in June Provinces' Column in The Chicago Sun, June 11, on the basis of information supplied by Field Museum.)

A resident of Dundee Road, Barrington, Illinois, Mr. Sidney H. George, called up his friend, Mr. Orr Goodson, Acting Director of Field Museum of Natural History, for aid in the solution of a turtle mystery.

"Yesterday I drove out of my garage and found a large turtle had stationed itself in my driveway," said Mr. George. "I managed to get past it without hurting it and when I got back in the evening there it was in exactly the same spot. The next morning it was gone, but in the sand and gravel where it had been were marks indicating that a hole had been dug and covered over. It was as though a murderer had concealed a corpse. Perhaps you had better send a squad car full of herpetologists to investigate."

The case was referred to Mr. Karl P. Schmidt, Chief Curator of Zoology and a specialist in reptiles and amphibians.

"It's not a murder, it's a blessed event," said Mr. Schmidt. "It undoubtedly was a pond turtle laying a couple of dozen eggs, and burying them in the approved turtle fashion. The heat of the ground should hatch them eventually."

If Mr. George will wait until August, and be careful not to drive over the spot, Mr. Schmidt added, a dozen or two baby turtles may emerge from his driveway to face the world.

Mr. Goodson invited Mr. George to visit Field Museum and inspect a habitat group showing a giant loggerhead turtle of Florida laying and burying its eggs on a beach.

Strategic Quartz

Rock crystal, the transparent variety of crystal quartz, is so abundant that tons are thrown away every year as worthless by quarriers of other minerals. Yet one variety, of such great industrial importance that it is classed as a strategic mineral, can be found in commercial quantity only in Brazil. It is used to control the length of radio waves, and of radio frequency oscillations, wherever their accurate control is required.

HOW BIG IS A DINOSAUR?

This innocent question is sometimes asked and not always by children. The name "dinosaur," signifying "gigantic lizard," is misleading. Almost all animals, however large they may be, were once small. This is almost always true of the race as well as of the individual. Large kinds of animals do not suddenly spring into being as an offshoot from other large animals, but arise from opportunity coming to modest and inconspicuous kinds of animals and their adaptation to this new opportunity, whether it be a new supply of food, a favorable climate or other beneficent conditions.

In fact, at the heyday of dinosaurian life there were small dinosaurs as well as large. Some were slender and active tree-climbers and evidently lived from robbing birds' nests, while others, notably one, *Brachiosaurus*, carried his head thirty-odd feet high, looking over treetops to cull his land and to gain his outlook upon life. And there were intermediate plodders who took what came and were satisfied. —E.S.R.

ETHNOLOGY OF MELANESIA

by Albert B. Lewis

Especially noteworthy in these times when so much fighting is going on in the waters and islands of the South Pacific, is Field Museum's copious handbook on Melanesia. This most readable book was written by the late Dr. Albert B. Lewis, who for many years was Curator of Melanesian Ethnology. It deals with the geography and climate of the islands of that area, and especially with the different groups of peoples and their varied cultures. Written in popular style, it is especially suitable for the general reader.



TREE-FERN DRUMS
OF NEW HEBRIDES

(Hall A)

On sale at THE BOOK SHOP of FIELD MUSEUM. 210 pages, 64 plates, 2 maps. \$1.75. Mail orders accepted.

CHINESE CARVED IVORY IN NEW EXHIBIT

By C. MARTIN WILBUR

CURATOR OF CHINESE ARCHAEOLOGY AND ETHNOLOGY

Americans delight in Chinese figures carved of ivory, and in the colorful little bottles ingeniously fashioned by the Chinese to hold snuff. They are "decorative art," frankly made to be sold to persons who enjoy the ownership of such knick-knacks. Most examples are modern—a piece that is two centuries old is counted ancient. It requires no esoteric knowledge to admire such things, and examples selected purely for visual enjoyment have been recently put on display in Stanley Field Hall. They include a few of the more handsome ivories from a bequest left to the Museum by Mr. Louis L. Valentine, and some of the brighter bottles from the collection bequeathed by Mrs. Frances Gaylord Smith, both of whom were prominent Chicagoans. None of these objects have been exhibited previously by Field Museum.

It was about 1680 that Europeans introduced the Chinese to the practice of taking snuff, a powdered form of the American Indian tobacco. For a century and a half the practice was popular in fashionable Chinese circles just as it was in Europe. A gentleman carried his snuff in a fancy bottle that ranged in height from one and a half to four inches, and that held about a tablespoonful. The bottles were made to be shown off and admired, and the artisans used all the colorful materials available. Mrs. Smith's collection affords a wide variety. Among the always popular polished stone bottles, several types of agate may be seen, as well as carnelian, crystal, onyx, lapis lazuli, and turquoise. Jade bottles of many colors from the same collection are displayed in the Hall of Jade (Hall 30). Porcelain bottles followed in miniature the ceramic fashions of the last two centuries, sometimes even copying in decoration the best vases and table ware made at the imperial kilns. Glass bottles were sometimes made of different colored layers carved in cameo style; some are opaque with floral painting in enamel, or of clear brilliant color. The most surprising glass bottles are those painted on the inside with landscapes and floral scenes—painted through a neck one-quarter of an inch in diameter, a feat of skill and patience of the sort in which Chinese artisans surpass all others. Lacquer, ivory, coral, and amber are other materials—only a few of the many that could be shown in the allotted space.

The shape and size of the ivory tusk limit the forms into which it can be carved. Figures of humans, bending slightly, are especially suitable, and these the Chinese seem to enjoy producing. The subjects they choose to portray, however, are rather conventionalized: deities, and persons of Chinese legend and romance. From Mr. Valentine's collection it has been possible

to show a well-carved set of the "Eight Immortals," each of whom has a particular legend known to all Chinese; two representations of the Goddess of Mercy and two of the God of Long Life; and a group from the "Eighteen Buddhist Worthies," who hold a position in Chinese folk art somewhat like that which the Christian saints and martyrs hold in European folk art. This display is a reminder of another group of Chinese ivories exhibited in George T. and Frances Gaylord Smith Hall (Hall 24).

IMPORTANT MOLLUSK COLLECTION ACQUIRED BY MUSEUM

By FRITZ HAAS

CURATOR OF LOWER INVERTEBRATES

Mollusks of both the sea and fresh water, including especially the familiar oysters, clams, and sea-snails, together with the land snails, have been of great importance to mankind since the time of the earliest Stone Age, first as a source of food, and



VARIATIONS IN SHELLS

Five representatives of South and Central American land snails of the family Bulimulidae, showing variations in size and shape. (Figures about two-thirds natural size).

secondarily for tools and ornaments. Their importance in these respects is a reflection of the fact that the mollusks are among the more successful kinds of animals, with thousands of living species, ranging in size from that of minute snails no larger than pinheads to that of the giant squids of the ocean, which may reach a length of fifty feet. At the same time, the mollusk group is one of the most ancient of living types, appearing in abundance in the earliest fossil record.

The attractiveness of snail and bivalve shells as curios led naturally to the formation of large collections of these objects, at first in private hands. Such collections formed the basis of early studies of mollusks, and, as the private collections gradually were transferred to museums, they formed the reference collections on which further scientific research was based. Though the heyday of great private collections is largely past, this process still continues. The larger and more showy marine shells are naturally important for museum exhibition; the vast number of smaller and less conspicuous species are no less important to zoological

research. Their infinite variety of shape and pattern makes them of extreme importance in evolutionary and geographic studies, as may be seen from published studies of the remarkable Hawaiian snails of the genus *Achatinella*. The fact that the hard shells of mollusks naturally tend to be preserved in great numbers as fossils gives the group a great practical importance to geology, which dates its successive deposited strata by means of the study of such fossil remains.

Through the interest of Mr. Stanley Field, President of the Museum, the Department of Zoology has recently acquired one of the most notable collections of mollusks remaining in private hands. This collection, accumulated over a period of more than forty years by Mr. Walter F. Webb, of Rochester, New York, comprises especially land and fresh water snails and bivalves. It includes about 20,000 lots of shells, with more than 100,000 individual specimens. Mr. Webb, a well-known dealer in shells, accumulated his personal collection as the by-product of his business, retaining the finest specimens and the rarest forms for himself.

The permanent scientific value of the Webb Collection was greatly enhanced by Mr. Webb's purchase of other well-known private collections, such as those of Mr. G. K. Gude, of London, Mr. John Ritchie, of Boston, and Mr. Robert Jetschin, of Breslau. These collections date in part from as far back as the eighteen-sixties; the identifications thus supply a picture of the classification in use at those times by the authorities in the field of conchology. Of still greater scientific importance is the fact that the collection thus includes some of the original specimens on which the descriptions of new species and varieties were based. These are the so-called co-types and paratypes, and they are of special importance for reference, tending to stabilize classification and nomenclature.

The typical material, representing about 800 forms, includes paratypes of most of Gude's species of the snail family Helicidae, and of many of the Japanese forms described by Pilsbry, and by Pilsbry and Hirase. The collection in general was further enriched by extended exchanges with conchologists in all continents, often with the further addition of typical material.

Mr. Webb included with the collection a number of important publications on mollusks, some of them extremely important for their rarity. It is gratifying that he has continued his interest in the collection, supplementing it by gifts of important specimens acquired by himself subsequent to the purchase agreement.

Thus at a single stroke, Field Museum has obtained a collection of world-wide scope that fills a serious gap in its zoological collections, and forms a basis for further active research in the field now usually referred to as "malacology."

THINGS YOU MAY HAVE MISSED**The Queerest of Boats**

Many odd types of watercraft have come to notice as a result of the war—"invasion barges" whose lines are often reminiscent of very ancient vessels, the controversial "sea otter" boats whose design is at great variance from conventional modern ideas of marine architecture, and various kinds of collapsible round and oval rubber boats and rafts carried by aviators as life saving equipment. Every army has been impressed with the necessity of carrying equipment for hurried crossing of rivers and canals which may lie as obstacles in its path, and there are even amphibian tanks.

None of the new types of craft is more peculiar than the coracle. Field Museum has on exhibition in its Hall of Chinese and Tibetan Ethnology (Hall 32) a Tibetan boat of the coracle type. Clumsily designed boats have immemorially been sneered at as "old tubs," and the coracle is actually and purposely tub-like in design. The Tibetan coracle displayed in the Museum is built on a frame constructed merely of bent willow twigs. Cattle played an inordinately prominent part in its construction, for it is "planked" with the skins of yaks, fastened with rawhide thongs, and when in use it was even caulked against leakage with a bovine product—*butter!* Such boats are said to be the only type made and used by the Tibetans.

Coracles, however, are not confined to Tibet. The name for these skin boats comes from the Welsh word "corwgl," meaning both "carcass" and "boat." Once coracles were widely used over much of the northern hemisphere. In their day they



BOAT MADE OF SKINS AND TWIGS

The "three men in a tub" would have been quite at home navigating in this Tibetan coracle. It was used for ferrying passengers and cargoes across rivers. Exhibited in Hall 32.

were even improvised for use as war craft, just as almost anything which will float is playing its part in the war of today. Coracles were used by Alexander the Great on his expedition of conquest in the Orient. At the time of the Roman invasion, they were used in Britain. Western Asia and many parts of India found them useful, while even in America the Mandan Indians of the

upper Missouri River constructed in similar fashion so-called "bull boats." As a matter of fact, fishermen on the Severn and other Welsh rivers still use coracles.

The Tibetan coracle exhibited at the Museum is about five and one-half feet in diameter, and three feet high. The hides composing the sides of this semi-globular vessel are sewed together with rawhide, and this requires a great number of holes, which in turn necessitate the use of the butter caulking. Kneeling on the bottom, the boatman directs the coracle to the opposite shore by means of a short paddle. The downstream drift of the current causes complications for the navigator. Surprisingly enough, these crude boats are capable of carrying three or four men, or two men and about 200 pounds of goods. At ferry stations in Tibet there are generally only two or three of these boats, and it often takes an entire day to transport a large caravan across a river.

Part of Field Museum's Tibetan collection was transported in the very coracle now exhibited here. It was used several times by the late Dr. Berthold Laufer, former Curator of Anthropology, while leading an expedition to Tibet. When he no longer needed it for practical use, he purchased it for exhibition, since few such boats are available for inspection in museums.

GUATEMALA EXPLORER REPORTS PROGRESS IN COLLECTING

Dr. Julian A. Steyermark, Assistant Curator of the Herbarium, reports continued success in his botanical exploration of Guatemala. Recently he spent three weeks with his volunteer assistant, Mr. Albert Vatter, and Indian paddlers in a thirty-foot dugout canoe on the rivers of southern Petén, a region sparsely inhabited and almost wholly unknown scientifically. The party camped along the stream banks, and was fortunate in having fine weather for collecting. While the vegetation of this lowland area is poor in species of plants as compared with the near-by mountains of Guatemala, an interesting collection was made that probably contains some additions to the previously known flora of the country.

Collecting is now being carried on by Dr. Steyermark from a *finca* on the Pacific slope of Guatemala, where there is a large commercial plantation of cinchona for quinine production. Although the trees are not yet ready for exploitation, this planting, with others in the same region, marks the beginning of a new Central American industry which, it is hoped, may in time free the United States from its dependence upon the East Indies for a supply of this most essential drug.

—P.C.S.

Striking similarities to our modern architecture are found in the model of a Zapotecan palace at Mitla, exhibited in Hall 8.

ACTING DIRECTOR ORR GOODSON TAKES CHARGE OF MUSEUM

Mr. Orr Goodson, appointed Acting Director of Field Museum by action of the Board of Trustees at a meeting held on May 25, assumed executive control of the institution on June 1. Mr. Goodson joined the staff as Assistant to the Director on July 1, 1941. He is to serve as Acting Director until the return from war service of the Director, Lieutenant Colonel Clifford C. Gregg, recently transferred out of the Chicago area by the U.S. Army.

Prior to coming to Field Museum, Mr. Goodson had been an executive of a large Chicago loop office building. Previous to that he had served in administrative capacities in a number of business organizations in California and other parts of the country.

Mr. Goodson was born in Parnell, Missouri. He attended the University of Nebraska and George Washington University, Washington, D.C., at both of which, in addition to his scholastic activities, he became a star basketball player and captain of teams. His present residence is in Glencoe, Illinois, where he takes an active part in community activities and in the village's civilian defense program. One of his first undertakings at the Museum was the organization and training of selected members of the staff for the protection of the Museum building and its contents in the event that Chicago should be subjected to enemy attack.

Magnesium Under Chicago

A great body of a potential ore of the strategic metal magnesium lies under Chicago. This city is built upon a bed of dolomite (the carbonate of lime and magnesia) which is from 200 to 450 feet thick. Although this rock is mined elsewhere as a source of magnesium, such use of it here is unlikely, because large deposits are available in regions where land values are much lower. Too few analyses of the Chicago bed rock have been reported to determine its average value, but five analyses made on rock from our local quarries all show a content of magnesium metal between twelve and thirteen per cent, nearly the theoretical maximum for ore of this kind.—H.W.N.

A most effective panorama in James Nelson and Anna Louise Raymond Hall (Hall 4), shows the life of the Sauk and Fox Indians of Tama, Iowa. A close study of this group reveals their way of life.

Field Museum of Natural History

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FIELD MUSEUM NEWS

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

MUSEUMS IN WAR AND AFTER

When Pearl Harbor and Wake Island appeared in the headlines last December, many an American citizen was obliged to consult his old school geography. Even Singapore and Hongkong were little known, but as events rapidly followed, especially in the Pacific area, unfamiliar names became familiar and geographic knowledge in the United States increased at an unprecedented rate. It was much the same, although to a lesser degree, in 1898 when the Spanish-American War suddenly gave us the battle of Manila Bay and we learned of the existence of the Philippine Islands. Since that time we have grown somewhat less provincial, and the present war is plainly carrying us into a new and, we hope, a more enlightened era.

For better or worse, it is now beyond cavil that America must have a world viewpoint in which knowledge will be power, and understanding of conditions beyond our borders will be essential to progress. The relation of museums to this is in the fact that they, especially large natural history institutions such as Field Museum, have always had a world viewpoint. As everyone knows, science is international, the reason being that science seeks only the truth regardless of political or nationalistic prejudices.

Burma, Timor, New Caledonia, Indo-China, Madagascar, and all the other

battle fronts are not merely names to the Museum. They stand for interesting fields of study—past, present, or future. Many of them are already represented in the Museum by large collections, by special exhibits, by carefully gathered literature, and by specialists on the staff. Often they stand for millions of human beings destined to play an important part in a coming world of change.

While the war goes on, it is generally recognized that the open museum is an important prop to civilian morale and a source of "recreation" and information to the enlisted man in training. The parent whose boy is flying over the steaming jungles of New Guinea or through the chilly fogs of the Aleutian Islands is pleased to find in the Museum tangible evidences of the actual conditions in these little known regions. The boy, himself, when he returns, as the majority will, may bring his parents to the Museum to confirm some of the stories he has to tell. All this becomes a part of the adult education which is one of the Museum's largest functions. Perhaps it would do no harm if even some of our omniscient columnists and radio commentators would take an occasional stroll in the Museum.

After the war is over, not only when the peace settlements are made, but for years afterwards, the kind of knowledge that museums foster will be needed as never before. Whether or not America is to take world leadership probably depends upon whether she is ready for it. Wise and farsighted statesmanship will not avail without the support of intelligent public opinion and, at best, success is far from certain. No one can foresee postwar conditions very clearly, but no one can doubt that public education is a prime requisite for a better world. In this, it is to be hoped and expected, museums may play an increasingly important part.

Staff Notes

Mr. A. B. Wolcott, Assistant Curator of the N. W. Harris Public School Extension, has been retired on pension. He has been ill since November.

Mr. Emmet R. Blake, Assistant Curator of Birds, left for service in the United States Army June 15. Mr. William Beecher, temporary assistant in the Divisions of Birds and Mammals, was also inducted into the Army, on June 24.

Annual Report Published

The Annual Report of the Director of Field Museum to the Board of Trustees—a book of 156 pages illustrated with ten plates—has been published, and distribution of copies to every Member of Field Museum will be completed during July. Publication

was delayed due to the fact that the Director, Lieutenant Colonel Clifford C. Gregg, is on active duty with the United States Army.

The Report details operations of all Departments and Divisions of the Museum during the year ended December 31, 1941. It contains also a summary of all gifts and bequests, lists of Members in all classes, and other information.

Noted Botanist Visits Museum

Dr. Liberty H. Bailey, dean of American botanists and author of *The Standard Encyclopedia of Horticulture*, recently spent a week in the Museum photographing specimens of palms and Rubus in the collections of the Department of Botany.

FIELD MUSEUM HONOR ROLL

Now in the Service of their Country:

Theodore Roosevelt, Trustee—Brigadier-General, U.S. Army.

Lester Armour, Trustee—Lieutenant Commander, U.S. Navy.

Joseph Nash Field, Trustee—Lieutenant, U.S. Navy.

Clifford C. Gregg, Director—Lieutenant Colonel, A.G.D., U.S. Army.

Melvin A. Traylor, Jr., Associate, Birds—Private, U.S. Marine Corps.

Dr. John Rinaldo, Associate, Southwestern Archaeology—Private, U.S. Army.

Dr. Alexander Spoehr, Assistant Curator, North American Ethnology and Archaeology—Corporal, U.S. Army.

Emmet R. Blake, Assistant Curator, Birds—Private, U.S. Army.

William Beecher, Temporary Assistant, Department of Zoology—Private, U.S. Army.

Bert E. Grove, Guide-Lecturer—American Field Service, in North Africa.

Patrick T. McEnery, Guard—Master-at-arms, U.S. Navy.

John Syckowski, Guard—Chief Commissary Steward, U.S. Navy.

George Jahrand, Guard—Chief Water Tender, U.S. Navy.

M. C. Darnall, Jr., Guard—Candidates' Class, U.S. Marine Corps Reserve (Officers' Training Course).

James C. McIntyre, Guard—Private, U.S. Army, Coast Artillery.

Clyde James Nash, Guard—Chief Gunner's Mate, U.S. Navy.

Nicholas Repar, Printer—First Class Seaman, U.S. Navy.

IN A CIVILIAN STATUS

Rudyerd Boulton, Curator, Birds—Staff of Office of Strategic Services, Washington, D.C.

Bryant Mather, Assistant Curator, Mineralogy—Civil Service Worker for Corps of Engineers, U.S. Army.

John McGinnis, Guard—U.S. Merchant Marine.

MORE ADVENTURES OF BOTANIST IN VENEZUELAN WILDS

(Editor's Note:—The following new report from Mr. Llewelyn Williams continues the account of his expedition into southern Venezuela which was begun in the June FIELD MUSEUM NEWS.)

BY LLEWELYN WILLIAMS
CURATOR OF ECONOMIC BOTANY

We arrived at San Fernando de Atabapo on April 17, after hunting wild ducks and egrets on the way for food, and sleeping as usual on the open granite slabs along the banks. A motor launch left at 8 the following morning up the Orinoco, and we followed in ours at 11, but we had trouble with the outboard motor and made a couple of stops on the way to change or clean the plugs. We stopped that night at an abandoned site, known as Minisia.

Soon after departing the following morning, one of the men said he thought that the other launch had met with disaster and had burned, because he had seen small pieces of burned wood floating downstream. In the afternoon we ran into a *chubasco*—a high wind, followed by heavy rain. The water was churned into high waves. We could not tie to the steep bank, because of the danger of falling trees or earth, but fortunately we managed to reach a tree that had fallen into the water. Later we stopped on a large rock to make a repair to the motor and one of the men said he could see people moving about on a rock some distance up the river.

DISASTER VICTIMS RESCUED

As we got nearer, the figures became plainer, and now we could see a *piragua*, but no sign of the launch. When we got within about 50 yards we saw what remained of the launch—just a burnt hulk, a mere shell of the hull that reached to the surface of the water. The man in charge of the launch, the *resguardo* of the customs at El Cocuy, was pacing to and fro on the rock. Another man was covered with smudges of soot. To one side, lying under a cluster of bushes, was the motor operator, burned severely around the face, right arm, and leg, and groaning in pain. They had no food and only the clothes they had worn. Almost everything else was lost in the fire, or blown up in the explosion that followed. I had my tent set up to house the injured man and tended to his wounds, for he had not been taken care of since the accident.

Castro, the *resguardo*, insisted on going up river with me to San Antonio, but I told him that the best thing would be to return to Puerto Ayacucho with the sick man, where he could have proper treatment. It took a long time to convince Castro but finally he agreed.

That was the most miserable Sunday night I have spent in a long time. We were right in the middle of the rapids of Santa Barbara, below the mouth of the Ventuari, on a small rough rock in mid-river.

Flashes of lightning lit up the sky almost constantly to the north, thunder rolled over the forest to the west, it was dark and we could hear the beating of rain falling on the water and forest to the south. One of the men said it was going to be an *aguacero blanco*, which meant that it would rain all night. Soon we had to abandon the bed of rock and hasten to the boat where we huddled among the cargo to sleep.

The following morning I again treated the burns of the young man, who was still in great pain. Then I placed him in my boat with sufficient food to last a week for him, for Castro, and the other men. Sixto, my mechanic, went with them to manage the outboard motor.

We stopped on the wooded island of Callare with a group of Piaroa Indians. Most of them suffered from cold. One woman, sick and extremely thin, kept up a constant whine. So we decided to move into the forest, set up my tent, and build a rancho to house my equipment. Sixto came back in twelve days. The party had arrived safely but not too soundly at Sanariapo—the overland trip of forty miles to Ayacucho was almost too much for the sick man, and some of the others as well.

A PLAGUE OF INSECTS

From the island of Callare we traveled to San Antonio, where we spent a few days collecting, then we continued for three more days until we reached the mouth of the Casiquiare and came to Tamatama. One week was spent collecting at this place before proceeding further upstream to Esmeralda. I shall always remember Esmeralda for two reasons—Duida, towering above the savanna, and the stinging flies (called "mosquitos" although they are not) plaguing us constantly from sunrise to sunset. They seem to come in waves and even the Indians I have with me are groaning and grunting under their attacks. The backs of our hands are covered with little red spots which turn black on the second day. One boy, who seems to suffer more than the rest, broke out in numerous small blisters all over his hands, fingers, and forearm. We covered our faces with towels, shirts or any other thing available. At night we have the "zancudos" (which are mosquitos) to contend with.

As a cook I have a tall, lanky fellow who goes by the name of Andrés Castro, born in Trinidad of a Negro father and a Hindu mother. He spends his spare time composing third rate poetry, keeps up a constant chatter which makes us forget the pests, and is a good hunter. On our way up he shot two garzas morenas, a white egret, three deer, a paujil, and three wild ducks.

The weather is becoming more unfavorable for collecting, as it rains almost daily and sometimes all night. From here I plan to leave for the Casiquiare to collect around Capihuara.

SERIES OF LECTURES OFFERED ON WAR BACKGROUNDS

"Backgrounds of the War" a series of lectures on subjects of vital and timely interest, will be presented for the general public at Field Museum on Thursday afternoons during July by staff lecturers of the Raymond Foundation. The lectures, illustrated with slides, will begin at 2:30 P.M., and will be presented in the Museum's lecture hall; each will be followed by a



EXPLANATIONS OF SOME WAR FACTS

Miss Miriam Wood (left), Chief of the James Nelson and Anna Louise Raymond Foundation staff, and Mrs. Anne Harding Spoehr, Museum artist, preparing for "Backgrounds of the War" lectures to be given at Field Museum each Thursday afternoon during July, at 2:30.

conducted tour of certain sections of the Museum exhibits correlating with the particular subject under discussion. Admission is free. Following are the dates, subjects, and speakers:

July 2—MATERIAL OF STRATEGIC IMPORTANCE IN WAR TIMES (illustrated by material pertaining to the sources and production of mineral and plant products essential to the war effort). Miss Marie B. Pabst.

July 9—THE PEOPLE OF AFRICA (native life from Capetown to Cairo, illustrated by the extensive ethnological material collected by Field Museum African expeditions). Miss Elizabeth Hambleton.

July 16—ALASKA (the important part that our northernmost American territory plays as a factor in war geography, and what the people of Alaska are doing to win the war). Miss Miriam Wood.

July 23—BRAZIL, A COUNTRY OF MANY UNUSED RESOURCES (the actual and potential importance to the United States' war effort of our largest Latin-American neighbor). Miss Marie B. Pabst.

July 30—OUR ANIMAL ENEMIES IN THE WAR ZONES (how insects, fishes, snakes and other creatures affect the conduct of the war and must be considered as important problems). Miss Elizabeth Best.

GIFTS TO THE MUSEUM DURING PAST MONTH

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

Department of Anthropology:

From Mrs. Neva H. Farley, St. Paul, Minn.—10 Chinese bronze mirrors, Chou to Sung periods.

Department of Botany:

From Mrs. M. Alice Cornman, Cardiff-by-the-Sea, Calif.—101 species of mosses, Panama; from University of California, Berkeley, Calif.—676 specimens of algae, mostly California; from Harry Hoogstraal, Urbana, Ill.—56 herbarium specimens, Mexico; from Dr. Roland M. Harper, University, Ala.—19 herbarium specimens and 50 photographs, Alabama; from Dr. Walter Kiener, Lincoln, Neb.—20 specimens of algae, Colorado, Nebraska, and vicinity; from Donald Richards, Chicago—735 cryptogams, Germany; from Fred O. Thompson, Des Moines, Iowa—5 specimens of coal ball material, polished slabs, and peel; from H. C. Hanson, Madison, Wis.—34 herbarium specimens, Manitoba, Canada.

Department of Geology:

From C. M. Barber, Hot Springs, Ark.—2 specimens of fossil turtles, Arkansas; from William E. Menzel, Chicago—3 cabochons of anorthosite, Wisconsin.

Department of Zoology:

From Dr. Charles H. Seavers, Chicago—444 beetles, United States; from Orr Goodson, Glencoe, Ill.—4 chipmunks, Illinois; from Museum of Comparative Zoology, Cambridge, Mass.—300 tiger beetles, United States.

The Library:

Valuable books from National Education Association, and Dr. Henry Field, both of Washington, D.C.; and from Dr. Wilfred H. Osgood, and William J. Beecher, both of Chicago.

Correction:

The Rockefeller Foundation calls attention to the fact that a gift of 11 miscellaneous Brazilian birds, credited to it in the January issue of FIELD MUSEUM NEWS, should have been attributed to the Ministry of Education and Health, Yellow Fever Research Service, of Brazil.

SUMMER GUIDE-LECTURE TOURS MORNINGS AND AFTERNOONS

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.

Persons wishing to participate should apply at North Entrance. Tours are free. There are no tours given on Saturdays, Sundays, or on July Fourth.

By pre-arrangement with the Acting Director, special tours are available to parties of ten or more persons.

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"Here is an invaluable guide for anyone interested in handicraft, whether ancient or modern," says Dr. Paul S. Martin, Chief Curator of Anthropology. "The fact that the book is in its eighth edition indicates its usefulness. Those responsible for planning projects for Boy Scouts, Girl Scouts, camps, settlement houses, and other groups have in this book a gold mine of suggestions. Included are detailed instructions, sketches, and photographs showing how to make objects of leather, plastics, metal, wood, and the like. Many other handicraft procedures are elaborately treated, such as archery, knot tying, pottery, weaving, gem cutting, and primitive Indian crafts. Boys, girls, and adults interested in anthropology will find the chapter on primitive Indian handicraft absorbing and most informative."

On sale at THE BOOK SHOP of FIELD MUSEUM—\$3. Mail orders accepted.

NEW MEMBERS

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

Contributors

Mrs. Annie S. Coburn*

Associate Members

A. J. Filkins, J. J. Schwander, Joseph Wertheimer.

Annual Members

Abe C. Bailey, Mrs. Clarence W. Balke, Harry P. Baumann, Stanford Clinton, Mrs. Burnham M. Fisk, Charles E. Good, Miss Margaret Govett, Mrs. Yngve Hogsten, Mervin H. Lescure, John T. Love, Dr. William J. Michel, Walter F. Mullady, James S. Nachman, Judge Harold P. O'Connell, John R. Ordway, Dr. Eliot F. Porter, G. G. Preston, Ira Salomon, Frank P. Sheridan, Miss L. M. Sherwood, Dr. O. P. Sinnerud, O. O. Smaha, Samuel Steiner, Jr., Dr. J. Daniel Willens, W. W. Youngren.

*Deceased.

RAYMOND FOUNDATION PRESENTS CHILDREN'S SUMMER PROGRAMS

Six free programs of motion pictures for children will be given at Field Museum this summer by the James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures. The series will be presented on Thursday mornings in the James Simpson Theatre, beginning on July 2, and concluding on August 6. All six programs will begin at 10 A.M., and children from all parts of Chicago and suburbs are invited. No tickets are needed.

Most of the pictures to be presented have talking and sound effects, and some are in color. One—that of July 2 on the subject "Hostelling in South America"—will be accompanied by a lecture. Mr. Justin Cline, who has led many long bicycling journeys under the hostel plan, will be the lecturer. Other programs will feature one of the finest animal motion pictures ever made in Mexico, two famous films which had long runs on regular theatre circuits, and a full hour of especially selected animated cartoons.

Following are the dates, and subjects of each program:

July 2—HOSTELLING IN SOUTH AMERICA.

A bicycle trip through our neighboring continent. (*Motion pictures in color, with a lecture by Justin Cline.*)

July 9—THE ADVENTURES OF CHICO.

An Indian boy's adventures with animals and birds in Mexico.

July 16—THE BISCUIT EATER.

The story of a hunting dog and a boy. (*A picture which won wide acclaim from critics at the time of its presentation on theatrical circuits.*)

July 23—ELEPHANT BOY.

Sabu, child actor from India, takes the lead in a story by Rudyard Kipling. (*Another "hit" with theatre audiences throughout the country. Sabu is currently starred in "Jungle Book."*)

July 30—KINGS OF THE SIERRAS.

The story of a wild horse on the Great Plains.

August 6—VACATION SPECIAL—CARTOONS,

both in color and black-and-white. Films to be shown include: *Little Hiawatha*, *Elmer Elephant*, *Flying Mouse*, *Snubbed by a Snob*, *Pedagogical Institution*, and *The Ugly Dino*.

Museum's Division of Printing Expands Equipment

The Museum recently purchased and installed in its Division of Printing the latest model of type casting machine. The new caster, together with similar equipment previously used by the Division, has been housed in a room especially designed for the purpose. This addition gives Field Museum Press a complete type casting plant which will assure the uninterrupted production of the Museum's publications and other printing requirements.

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RUFF, BIRD WITH QUEEN ELIZABETH COLLAR, SHOWN IN NEW HABITAT GROUP

BY WILFRED H. OSGOOD

CURATOR EMERITUS, DEPARTMENT OF ZOOLOGY

Owing to the departure of many members of Field Museum's staff for war service, the production of new exhibits doubtless will be somewhat retarded. However, at least certain projects already under way can be completed. Among these are several habitat groups of foreign birds long planned and partially executed in Hall 20. Space for four European subjects was allotted in this hall and previously only two had been finished, the well known Scotch grouse, and the European stork. To these there is now added a group showing the remarkable bird of which the male is known as the ruff and the female as the reeve.

This bird, which is found over northern Europe and less commonly in Asia, is in many ways unique. It belongs to the great group of so-called shore birds and, except in the breeding season, has the general appearance of a rather good-sized sandpiper. Its breeding habits, however, are most extraordinary, and the plumage it assumes in spring is unparalleled. This nuptial plumage in the male is featured by a frill of elongated neck feathers forming a sort of shield and a tuft on each side of the head, while the short feathers of the face are shed and replaced by bead-like protuberances of bright pink or yellowish color. Moreover, there is great variation in color with different combinations of black, white, gray, and rich brown occurring either in solid blocks or in alternating bars.

Thus panoplied, the ruff is ready for wooing. Meanwhile, the females or reeves, somewhat smaller than the males, are com-

paratively plain and unchanged. As the time for nesting approaches, the ruffs become very active, gathering in groups on slight elevations or "hills" where a small subcircular space is nearly denuded of vegetation by their repeated tramplings.

thereafter his interest lags, he soon sheds his showy plumage, and he fails to assume any family responsibilities. As one writer has said: "The ruff, like other fine gentlemen, takes much more trouble with his courtship than with his duties as a husband."

Whilst the reeves are sitting on their eggs, scattered about the swamps, he is to be seen far away flitting about in flocks, and on the ground dancing and sparring with his companions.... But none of his spirit is expended in care for his family. He never comes to see after an enemy."

The ruffs and reeves provide various interesting problems to the student of evolution and heredity. Bright colors and gay plumage frequently characterize the male of many birds, but in the group to which this species belongs it is not the rule. In fact, it is in this group, which includes the snipes and sandpipers, that we find some of the most pronounced reversals of the usual



MALE RUFFS IN NUPTIAL PLUMAGE PERFORM "COURTSHIP DANCE"

When the ruff has won his reeve (as the less colorful female is known), and the eggs have been laid, his attentions cease. In some related species, the male incubates the eggs and cares for the young, the female being the deserter.

Here they quiver and pirouette and engage in violent but not very sanguinary combats. Their performances at this time are obviously connected with polygamy and sex excitement. In a general way they are somewhat comparable to the "dances" of some gallinaceous birds, notably the American prairie chicken. As in the case of other polygamous animals, the fighting and display do not result in a victor's triumphantly carrying off any given female, but may serve to eliminate younger birds and weaklings and to establish a certain standard of capacity. The females, in fact, come to the males rather than the reverse.

The male continues to "put on his show" even for some days after the females have made their nests and laid their eggs, but

sex behavior and plumage. Notably in the phalaropes the female is more brightly plumaged than the male and more aggressive in courtship; moreover, while she is relatively carefree, the male meekly sits on the eggs and guards the young. To some extent this is true of certain other shorebirds, including the dotterel, the godwits, and the dowitchers, while in most others the sexes are closely similar.

Thus among otherwise closely related birds we have opposite conditions of sex relations—the ruffs and reeves in which the predominance of the male is extreme, and the phalaropes in which the female takes the lead in both appearance and actions. Except for the comparatively recent work of experimental zoologists and physiologists



READY TO "SHOW OFF"

Close-up of ruff, showing the unique ear tufts and expansive collar which the birds acquire each spring. Thus adorned, they posture and fence competitively to be selected as mates by the females or reeves.

such a paradoxical condition would be puzzling, to say the least. It is now known, however, that secondary sex characters, such as the furbelows of the ruff, are governed by internal secretions or hormones, and the proportions of these which are carried in the blood stream determine the degree of maleness or femaleness. This is proved by the injection of glandular extracts or tissue from a male into a female, which causes the female to assume the showier plumage of the male.

While the possession of brighter color and more elaborate attire by the ruff than the reeve is not unusual, the very wide variation in color seems to be unique among birds and perhaps among animals. It has been said that no two ruffs are ever exactly alike, and this appears to be almost if not quite true. Some fifty specimens are in Field Museum's collection (including the Conover collection) of which about half are adult males in breeding plumage. Two of these have approximately the same color and markings, but all the others show wide diversity. It has been determined that each individual ruff assumes the same colors and markings at each breeding season throughout its lifetime. Therefore, it is probable that various types may be perpetuated through sex-linked inheritance. If some of these types could be segregated and bred *inter se*, the results might furnish ramifications such as would delight the most zealous geneticists.

Although essentially an Old World bird, this species, like many shore birds, is a great wanderer and has occasionally appeared in America, especially in Alaska and at several points in New England. For many years it was trapped, fattened, and sold in European markets as a table delicacy and, although by no means extinct, it is now relatively scarce. As early as 1893 Alfred Newton remarked significantly, "In England, of late years, it has been known to breed in only one locality, the name or situation of which it is not desirable to publish." One of its best strongholds is the Netherlands and it is there that it is repre-

sented in the Museum's group. This shows a green meadow and characteristic Dutch landscape with a bevy of the birds engaged in their nuptial activities. The birds were mounted by Staff Taxidermist John W. Moyer, the background is by Staff Artist Arthur G. Rueckert, and foreground accessories are by Preparator Frank H. Letl. The specimens used were especially selected from the best available in Field Museum's study collections, supplemented by an unusually notable one received as a gift from Mr. Boardman Conover, Trustee of the Museum and Research Associate in the Division of Birds.

ANCIENT COAL BALLS GIVEN TO FIELD MUSEUM

Learning during a recent visit that coal ball material was practically unrepresented in Field Museum's exhibits, Mr. Fred Thompson, of Des Moines, Iowa, promptly supplied the deficiency by sending several specimens of his own collecting. Mr. Thompson has long been interested in paleobotanical material yielded by the numerous coal mines operated in this part of the United States, and has been an assiduous collector of choice specimens for research purposes, especially for Harvard University. A few years ago he aided Field Museum in obtaining, from the University of Iowa, one of the fossil cycad trunks of the well-known Macbride collection representing the South Dakota locality which is now Cycad National Forest.

Coal balls are concretions, generally of dolomite or calcite, formed and mineralized in the early or peat stage of coal formation. Presumably remaining where they were formed, they are mostly found enclosed within the coal beds. They usually contain, imbedded in the mineralized ground mass, abundant plant remains either petrified or carbonized. Their paleobotanical interest resides, of course, in these enclosed remains—fragments of leaves, stems, seeds and spores—often preserved in such excellent condition that their minute structure may be examined with the microscope.

The material sent by Mr. Thompson consists of an entire small coal ball; a slab cut from a much larger one showing abundant fossil foliage with one large thick-walled seed; parts of another consisting almost entirely of fossilized wood, and a piece containing a fragment of Cordaites leaf.

Accompanying the fossil material is a so-called strip-film, produced by flowing a cut surface of a coal ball with celluloid, which, when peeled or stripped off after drying, removes from the cut surface an adherent film of fossilized material thin enough for examination by transmitted light. This simple and ingenious means of obtaining a substitute for a laboriously cut and polished thin section for study was developed by the late Professor A. C. Noé,

who was Research Associate in Paleobotany on Field Museum's staff.

On this particular celluloid film, as large as the palm of a hand, more than thirty seeds of various sizes may be counted. The largest is not quite complete but must have measured fully three inches in length; smaller ones are as large as a peach pit or almond; a few are the size of small beans, the remainder appear only as large as rice kernels. The large number of seeds visible on a single cut surface indicates the presence of many hundreds in this particular coal ball, a veritable squirrel's cache formed and fossilized geological ages before squirrels appeared on the earth.

The seed bearing plants of the period were of the long extinct group of seed ferns, or *Cycadofilices*, of which fossils and restorations may be seen in Martin A. and Carrie Ryerson Hall (Plant Life, Hall 29), and in the Carboniferous forest group in Ernest R. Graham Hall (Hall 38). The geological estimate of the age of the coal balls and the beds in which they are found is about 250 million years. The recently accessioned material came from the Urbandale Mine, near Des Moines, Iowa.

—B. E. DAHLGREN

Library Gifts

Mr. Henry W. Nichols, Chief Curator of Geology, has filed with the Acting Director a statement that he has provided in his will for a bequest of his scientific books to the Library of the Museum.

Mr. Emil Liljeblad, retired Assistant Curator of Insects, recently presented a number of notable books from his personal library on entomology.

Mr. William Beecher, temporary assistant in the Division of Birds and Mammals, prior to leaving for service in the United States Army, presented a copy of a book he had just published, *Nesting Birds and the Vegetation Substrate*.

WAR BACKGROUND LECTURES TO BE CONTINUED

Due to the enthusiastic reception accorded to the lecture series "Backgrounds of the War," presented at Field Museum on Thursday afternoons during July, it has been decided to extend the series into August. On August 6, Miss Elizabeth Hambleton will discuss "China in War and in Peace." On August 13, Miss Marie B. Pabst, will speak on "Materials of Strategic Importance in War Times" (a request repetition of the July 2 subject.) These lectures, illustrated with slides, will be presented at 2:30 p.m., in the lecture hall. Each will be followed by a conducted tour of exhibits. Admission is free.

EGYPT HAS SELDOM BEEN FREE OF FOREIGN DOMINATION

BY RICHARD A. MARTIN
CURATOR OF NEAR EASTERN ARCHAEOLOGY

... "the choicest of his bowmen were mustered, his chariotry was brought up from every side, ... his infantry marched out, the heavy armed troops arrived, beautiful in appearance, leading the bowmen against the enemy from every land ... the Lybians, Sardinians, Sicilians, Achaeans . . ."

Thus the Great Karnak Inscription heralds the first attack upon Egypt by Europeans some three thousand years ago. This is also the first written record mentioning European peoples.

In 1227 B.C. enemy forces moving from Lybia along the sea coast invaded the Nile

tion—Ethiopian, Assyrian, Persian, Greek, Roman, Sasanid, Arab, Turk, French, British.

The port of Alexandria, whose possession is now so essential for naval control of the eastern Mediterranean, owes its beginnings to another war. Construction of the town and harbor was ordered by Alexander the Great (331 B.C.) after his conquest of Egypt to provide a deep naval base and to facilitate shipping the produce of the fertile Nile valley back to the Greek mainland. The harbor at Alexandria was connected by canal to the Nile, and due to the presence of favorable ocean currents did not silt up as did the older Egyptian harbors on the east side of the delta.

Under Alexander's successors, the Ptolemies, Alexandria became the commercial capital of the world and the center of Greek scholarship. The Alexandrian museum with its great library produced the mathematicians Archimedes, Appolonius, and Eucleides; the astronomers Aristarchus, Erostosthenes, Hipparchus, and Claudius Ptolemaus; the physicians Erasistratus and Herophilus.

The importance of Alexandria declined with the Arab conquest of Caliph Omer in A.D. 642 when the newly founded city of Fustat, near modern Cairo, became the administrative center. Later, with the discovery of America and a direct sea route to

India, the status of

this famous port rapidly became that of a small provincial town. The renascence of Alexandria began in the early part of the last century when the city was again connected to the Nile by canal and served as the outlet for products of the fertile valley.

Aside from the natural productivity of Egypt, her controlling situation on the route from the Mediterranean to the Far East has made her a most desirable possession. The present Suez Canal was opened in 1869. As early as the 12th Dynasty (about 1900 B.C.) the Egyptians had constructed a canal from the Nile through the Wadi Tumilat and along the Bitter Lakes to the Red Sea. With the dissolution of the empire this canal fell into disrepair but was restored by Darius the Persian. Under the Ptolemies



CONQUEST CHANGED CULTURE OF EGYPT

Excavation of a Greco-Roman sarcophagus of the First Century A.D., at Ramleh, a suburb of Alexandria. This sarcophagus, now on exhibition in the Hall of Egypt at Field Museum, represents a period when profound changes were wrought in the life of the ancient Nile empire, as a result of invasion first by Alexander and his Greeks, and then by the Romans, with the following infiltration of European influences.

delta where they were defeated by the Egyptian army of King Merneptah, and driven back to the western plateau where the present battle for Egypt is in progress against descendants of some of these same early aggressors. More than 18,000 of the invaders were destroyed or captured.

Egypt has not always been so fortunate. The Hyksos invasion in the 17th Century B.C. placed her under control of foreign princes. However, shortly after overthrowing these foreigners the ancient Egyptian empire reached its greatest extent. With the decline of the empire, about 1000 B.C., Lybian mercenaries took over control and founded their own dynasty. Ephemeral Egyptian rulers have since appeared, but the long periods are those of foreign domina-



TYPICAL MODERN EGYPTIAN

A common laborer of the Land of the Nile, as he appears when "all dressed up" for some special occasion.

locks were constructed at the Red Sea end. Trajan repaired the canal in A.D. 98, and it was utilized by the Arabs in the 7th Century. Remains of this ancient canal show it to have been about 150 feet in width and 17 feet in depth. After being in disuse from the 8th Century the canal was again reopened to supply fresh water for the workers constructing the Suez Canal.

Much of the story of the ancient invasions of Egypt can be traced by study of Field Museum's Egyptian collections in Hall J. There are related exhibits also in the Roman collections in Hall 2.



CANAL IMPORTANT IN HIS DAY, TOO

Statue of Senmut, the court architect, holding a daughter of Queen Hatshepsut. About 1495 B.C. Hatshepsut dispatched a fleet to Punt by way of the Nile-Red Sea canal (which in its day paralleled, in effect, the Suez Canal). Senmut designed the great temple at Deir el-Bahri on the walls of which is carved the story of this ancient expedition. Punt was the Egyptian name for the land extending along the Somali coast of the Gulf of Aden.

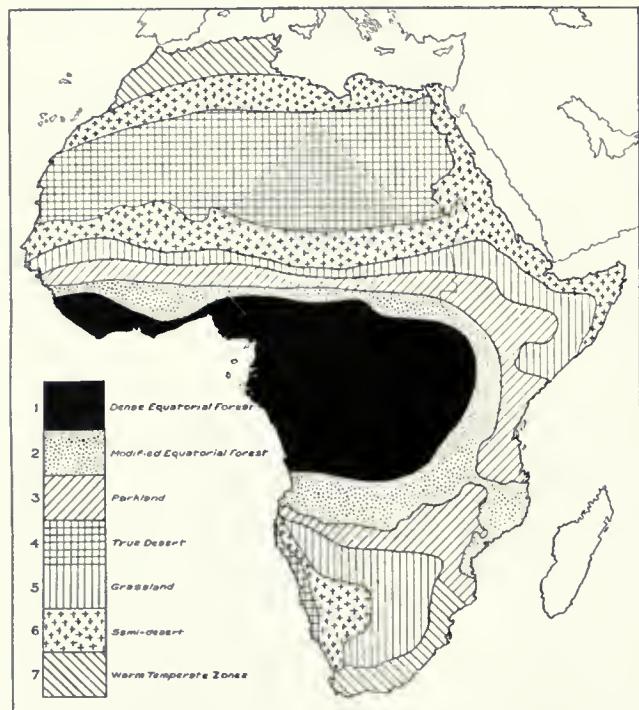
AFRICA, SO VITAL IN WORLD AFFAIRS TODAY, WELL REPRESENTED IN FIELD MUSEUM

BY WILFRID D. HAMBLY
CURATOR OF AFRICAN ETHNOLOGY

(Editor's Note:—A special article on Madagascar appeared in the June FIELD MUSEUM NEWS. An article on Egypt is published in the present number, and other parts of Africa which may be of timely interest will be treated in later issues. The following notes present a sketch of the continent as a whole.)

Since America's entry into the Second World War, there has been an ever growing realization of the importance of Africa.

Primarily the development of the airplane, and especially of long-range bombers, has brought home the fact that a distance of less than 2,000 miles separates South America and Africa—a matter of but a few hours' flight—and this has changed political thought and military strategy.



WIDE VARIETY OF VEGETATION AREAS IN AFRICA

It would be a mistake, however, to assume that the attitude of America toward African peoples and their future is entirely new. During a long period in the 18th Century, European countries complacently supported a system of appeasement by making substantial payments to Barbary pirates of the north coast of Africa in order to purchase immunity from attack for their merchant vessels. Thousands of Europeans and Americans toiled as slaves in the seaports of north Africa, wearily awaiting ransom. America, whose Congress once had voted \$80,000 for this form of tribute took to itself the honor of making the first determined attack against the pirates. President Thomas Jefferson preferred to fight, and in 1815 Admiral Stephen Decatur captured the piratical stronghold of Algiers.

American interest has also been focused on the republic of Liberia for more than a century. In 1820, the American Colonization Society sent a company of freed Negroes from America to what is now Liberia. These established themselves on the promontory where Monrovia now stands, purchased land from the local chief, and entered on a precarious existence marked by warfare with natives and with slave raiders of English, French and Spanish nationality. American commercial interests in Liberia have centered about the activities of a rubber company.

GEOGRAPHY OF WAR

The narrow Strait of Gibraltar, only nine miles across, is the entrance to the Mediterranean Sea, which for a distance of 2,000 miles to the Suez Canal, is a strategic center in the present conflict. Since 1869 the Suez Canal, connecting the Mediterranean with the Red Sea, has converted Africa into the world's largest island. Today, our thoughts are focused on the Red Sea as a strategic link between the Mediterranean and the Indian Ocean.

On the western side of Africa, the Azores, Madeira, the Canaries, and Cape Verde Islands are mentioned daily in news dispatches on submarine warfare and airplane reconnaissance. From the western prominence of Africa, in the region of Dakar and around the Cape of Good Hope to the Indian Ocean, there is a sweep of thousands of miles over which supplies have to be convoyed to the Near Eastern theatre of war, unless they are trucked across Africa for 5,000 miles.

Various African climates, which range from the dryness and scorching heat of the Sahara Desert to the great humidity of the central tropics, lead to a profusion of forms of animal and vegetable life, and finally to what are known as "cultural patterns" of human life which are based on climatic and general topographical conditions.

EXHIBITS FROM ANCIENT EGYPT

Probably the most notable contribution of Field Museum to the historical aspects of African study is the extensive Egyptian collection (in Hall J) which contains priceless objects of art, dating from 4,000 B.C. to the modern Arab period. (A special article on Egypt appears on page 3.) People flock to see the series of mummies, especially the famous Harwa whose wrappings are automatically X-rayed to bring the skeleton to

light before the visitors' eyes. Public interest is always attracted also by a mortuary boat, thirty-two feet long, built of cedar which the Egyptians probably brought from the mountains of Lebanon. It was used in the funeral procession of King Sesostris, about eighteen hundred years before the birth of Christ!

AFRICAN PLANT LIFE

Visitors with a practical turn of mind will find their greatest interest in a study of economic plant products in Hall 28. Here are shown raw materials such as cotton, sisal, flax, and resins, which are products of Africa as well as of several other parts of the world. In the Hall of Plant Life (Martin A. and Carrie Ryerson Hall—Hall 29) is a painting of the baobab tree, which is common in the more arid regions of Africa.

In the Department of Geology are specimens of tin, manganese, copper, ivory, and gold, all of which are essential war products, of which there is now a special display in Stanley Field Hall.

ANIMALS OF AFRICA

Of all Field Museum exhibits relating to Africa, the elephants which occupy a central position in Stanley Field Hall are the most conspicuous. These magnificent specimens were obtained by the late Carl E. Akeley. In the same hall are further examples of Mr. Akeley's art in the form of three notable bronze groups representing a lion hunt by the Nandi tribe of northeast Africa.

A vote of the children who visit Field Museum would probably show a consensus favoring the groups of African animals as the most interesting exhibits in the building. In Carl E. Akeley Memorial Hall of African Mammals (Hall 22) the largest group is a



Copyright Field Museum

SOUL OF AFRICA

Music and magic are the two key-notes of African life. This sculpture of a Senegalese drummer, by Malvina Hoffman, is in Hall 3. Groups in this hall are one of the rare striped antelope known as the bongo. Further attractions are specimens of the giant sable

antelope, a group of gorillas, and a specimen of that very rare animal, the okapi.

MANY TRIBES REPRESENTED

The physical types of man in Africa, together with various personal ornaments, and in some instances bodily deformations, are shown by Field Museum in two halls. In the Hall of the Races of Mankind (Chauncey Kepp Memorial Hall—Hall 3) are the world-famous bronze sculptures by Malvina Hoffman. The most remarkable of the African types depicted are those

northern and eastern parts of Africa, and the island of Madagascar. The most valuable specimens of African jewelry will be found in H. N. Higinbotham Hall of Gems and Jewels (Hall 31).

The other African hall, D, contains some remarkable specimens of wood-carving, including a large wooden drum from the Cameroons (Case 38). Initiation masks, used in mysterious ceremonies of secret societies, are shown in Case 13-A. A central case (No. 37) displaying three life-like figures



GIANT BAOBAB TREES OF AFRICA

Largest of African plants, these trees attain heights up to 70 feet, and circumferences more than 30 feet. In the background are seen examples of a common acacia. Baobab trees do not occur in forest formations, but are scattered in open savannas or grasslands from Senegal to Portuguese West Africa and across the central part of the continent to Ethiopia and British East Africa. Illustration reproduces a mural by the late Charles A. Corwin, in Hall 29.

illustrating the physique of the Pygmies, the Bushmen hunters of South Africa, the exceedingly tall Shilluk Negroes of the upper Nile valley, and the Zulus of South Africa. An African dancing girl and a Senegalese drummer reveal at a glance the soul of the African Negro, which is everywhere expressed by music and dancing. In Halls D and E a large collection of artifacts, accompanied by many photographs, furnishes supplementary details of human life in all parts of Africa.

ARTS OF THE NEGROES

The most artistic and valuable exhibits relating to African arts and handicraft are the bronze castings from Benin (Hall D, Cases 19 and 20). Bronzes of this kind, which include human heads and animal forms, were manufactured in this ancient city of West Africa when the Portuguese pioneers arrived at the end of the 15th century. The origin of the craft is unknown, but we are sure the Negro did not learn it from Europeans. Of the two halls of African Ethnology, E contains exhibits from the

of African medicine men, strikes the keynote of Negro psychology, which is a deeply-founded belief in the efficacy of magic.

Many of the wood carvings are ancestral figures—portraits which perpetuate the memory of deceased ancestors to whom prayers and offerings are made. Beadwork (Case 36), leather goods (Case 33), pottery (Case 15), and musical instruments (Cases 3 and 18), all serve to demonstrate the African Negro's cultural background.

The exploration of Africa goes back to the daring voyages of the Phoenicians, and to the southern land journeys of Egyptian caravans. But so far as European exploration is concerned, we need not retrace further than the 15th century, when the Portuguese were the great pioneers. Since then, roughly four centuries, there has been an almost uninterrupted series of daring sea voyages, and of inland explorations along the courses of the great rivers Nile, Congo, Niger, and Zambezi. Exploration of the Sahara Desert has provided stories of perseverance and supreme endurance never surpassed.

When, however, we ask what is the net result of all this striving and heroism, we have to answer sadly that so far it has been mainly a partitioning of Africa among European countries which have shown the bitterest rivalry.

POST-WAR PROBLEMS

However, in the past twenty-five years, since World War I, there have been definite attempts to change the policy from one of exploitation to a consideration of native African interests—physical, educational, commercial, and political. In such a vast and diversified continent the problems of human life necessarily must be deep and complex. Some of the human problems are of a fairly general kind; for example, on every hand the African social and religious background is being swept away by European contacts, with no adequate replacement.

One may be sure, however, that Africans, like many other peoples of the world, have a growing sense of personality, political unity, and physical power. Therefore at the end of the present conflict, the utmost good will and competent statesmanship will be necessary to avoid political catastrophe on the African continent.

RUBBER ONE OF MOST ENDURING SUBSTANCES ON EARTH

Rubber is one of the most enduring of substances. It is not corrupted by rust, and is seldom wholly destroyed except by fire or abrasion. Therefore it is probably true that almost all the rubber that ever has come into the United States is in existence today and usable if only it could be brought together. This obvious fact is of special significance in the present crisis, and emphasizes the statements made by those in charge of scrap rubber collecting who maintain that large quantities of used rubber exist if people only can be induced to make them available where they will do most good in winning the war.

Apropos of this, it is interesting to note that Mr. M. W. Harrington, a curator at the Southwest Museum in Los Angeles, has reported recently that his institution owns a rubber ball that is believed to be a thousand years old. It was found in 1909 during excavations near Toltec, Arizona. Presumably it was carried to Arizona by ancient pedestrian traders, who traveled between Mexico and what is now the southwestern United States. The ball is perhaps one used in the old ball-court game of *pelota*, still popular in a modified form in Mexico and Central America. This ancient rubber ball, probably the oldest in existence, is reported to be cracked and shriveled on the outside and to look like a lump of brownish dry clay, but inside the rubber is still fresh and resilient. Bring in your old rubber to fight Hitler and the Japs! No matter how old it is, it can still be salvaged and made useful.—P.C.S.

Field Museum of Natural History

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MANAGING EDITOR

H. B. HARTE.....Public Relations Counsel

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

THEY ALSO SUFFER

While war ravages humanity, lower forms of life get scant consideration. Even in times of peace it is difficult to protect the flowers, forests, birds and beasts, and when war comes the bars are wholly down. In the jungles of Malaysia and Papuasia, the wealth of life is so overpowering it is doubtful if thousands of "infiltrating" soldiers can do much permanent harm, but even there some animal and plant life is jeopardized. This is especially true on small islands which often form the exclusive habitat of peculiar animals. A soldier off duty is seldom averse to shooting anything subhuman and he is especially willing when it may provide a variation for the daily mess. He cannot be fighting all the time, and his opportunities for wantonness must be frequent. As Kipling pointed out, we cannot expect even our own men to be "plaster saints," and when it comes to our enemies, especially the Japanese, there is little hope.

The war has spread to so many out-of-the-way places that natural conditions are bound to be greatly disturbed, and it is not unlikely that exterminations or near exterminations will be among the many deplorable by-products. On the treeless Aleutian Islands of Attu and Kiska, recently occupied by the Japanese, are distinct species of ptarmigan, handsome grouse-like birds, nominally protected by our laws, but doubtless due to go into the soldier's pot by

hundreds. In this region also is the sea otter, one of the most interesting of living mammals and one of great potential economic value. From the verge of extinction it has just been restored to numbers thought to guarantee its continuation, but under war conditions its fate may again become uncertain. Another important animal of this region is the fur seal which passes regularly through the Aleutians on its migrations. It is interesting to note that our long standing treaty with Japan, by which she agreed not to kill seals on the high seas, was abrogated before war began. This treaty was profitable to Japan, and her refusal to continue it seems explainable only on the assumption that she expected to occupy our territory.

Examples of threats in other regions could be multiplied. North Africa, especially, might furnish a number, but there are some much nearer home. The danger to our western forests from fires set by incendiary bombs is a very real one which was quickly recognized, and protective measures are doubtless being taken, but the task is well nigh insuperable. We can only hope for success.

As so often said, our first business is to win the war, but the naturalists and conservationists can scarcely be blamed if their thoughts and sympathies turn occasionally to the killings that are not mentioned in the official communiqués.

Staff Notes

Mr. Rupert L. Wenzel, Assistant Curator of Insects, has been commissioned as a First Lieutenant in the Sanitary Corps of the United States Army. His first Army assignment, which became effective July 22, is at Billings General Hospital, Fort Benjamin Harrison, Indiana. Mr. Henry S. Dybas has been appointed a special temporary assistant in the Division of Insects during Lieutenant Wenzel's absence.

Dr. Alexander Spoehr, Field Museum's Assistant Curator of North American Archaeology and Ethnology, who for some months has been in the Army, was transferred last month to the Navy, with a commission as Ensign.

Mr. Paul O. McGrew, Assistant Curator of Paleontology, recently received the degree of Doctor of Philosophy from the University of Chicago. The degree was conferred in recognition of Dr. McGrew's extensive researches, and especially for his recent publication, issued by Field Museum Press, on *Fossil Rodents (Aplodontidae) from South Dakota*.

Mr. Karl P. Schmidt, Chief Curator of Zoology, has been appointed to the editorial board of *The American Midland Naturalist*,

to take the place of the late Dr. Marcus Ward Lyon. Mr. Schmidt's services will be in the field of cold-blooded vertebrates.

Mrs. Emily M. Wilcoxson, Librarian, and Mrs. Mary W. Baker, Associate Librarian, attended the recent sessions of the American Library Association, held at Milwaukee.

Mr. James C. McIntyre, a Museum guard on leave for Army service, was last month promoted from the rank of private to that of Second Lieutenant.

Mr. George I. Quimby, Jr., has been given a temporary appointment as Assistant Curator of North American Archaeology and Ethnology, and will serve in that position during the absence on war service of Dr. Alexander Spoehr, the regular Assistant Curator. Mr. Quimby was formerly Director of the Muskegon County Museum, and has also served in curatorial positions on the staffs of the University of Michigan Museum at Ann Arbor, the Louisiana State Archaeological Survey, Museum of Louisiana State University, and Museum of the Department of Anthropology at the University of Chicago.

FIELD MUSEUM HONOR ROLL

Now in the Nation's Service:

Military

THEODORE ROOSEVELT, Trustee—Brigadier-General, U.S. Army.

LESTER ARMOUR, Trustee—Lieutenant-Commander, U.S. Navy.

JOSEPH NASH FIELD, Trustee—Lieutenant, U.S. Navy.

CLIFFORD C. GREGG, Director—Lieutenant Colonel, A.G.D., U.S. Army.

MELVIN A. TRAYLOR, JR., Associate, Birds—Private, U.S. Marine Corps.

DR. JOHN RINALDO, Associate, Southwestern Archaeology—Private, U.S. Army.

DR. ALEXANDER SPOEHR, Assistant Curator, North American Ethnology and Archaeology—Ensign, U.S. Navy.

EMMET R. BLAKE, Assistant Curator, Birds—Private, U.S. Army.

RUPERT L. WENZEL, Assistant Curator, Insects—First Lieutenant, U.S. Army.

WILLIAM BEECHER, Temporary Assistant, Department of Zoology—Private, U.S. Army.

BERT E. GROVE, Guide-Lecturer—American Field Service, in North Africa.

PATRICK T. MCENERY, Guard—Master-at-arms, U.S. Navy.

JOHN SYCKOWSKI, Guard—Chief Commissary Steward, U.S. Navy.

GEORGE JAHRAND, Guard—Chief Water Tender, U.S. Navy.

M. C. DARNALL, JR., Guard—Seaman 2nd Class, U.S. Coast Guard.

JAMES C. MCINTYRE, Guard—Second Lieutenant U.S. Army.

CLYDE JAMES NASH, Guard—Chief Gunner's Mate, U.S. Navy.

NICHOLAS REPAR, Printer—First Class Seaman, U.S. Navy.

Other Services

RUDYERD BOULTON, Curator, Birds—Staff of Office of Strategic Services.

BRYANT MATHER, Assistant Curator, Mineralogy—Civil Service Worker for Corps of Engineers, U.S. Army.

JOHN McGINNIS, Guard—U. S. Merchant Marine.

NATIONALISTIC ZOOLOGY

In 1938 a Japanese zoologist issued a "List of the Japanese Mammals," followed in 1940 by a pretentious illustrated volume entitled "A Monograph of the Japanese Mammals."

Although largely compilations, both works bear evidence of care in preparation and need not be criticized on the score of accuracy, but the geographic limits they cover are both interesting and amusing. Some 370 species and subspecies are listed, including not only those of Japan proper and those of Saghalien Island and the Kurile Islands, for which there might be some justification, but also those of Korea and Formosa and, still more surprising, those of the Marianne, Pelew, and Caroline Islands.

The mandated Pacific Islands evidently were regarded as part of Japan at least four or five years ago. The inclusion of Korea adds a large part of the fauna of all eastern Asia. Manchuria, for some reason, is omitted, perhaps because it was too large an order.

If we applied the Japanese principle we should, in publishing on the fauna and flora of the United States or North America, include those of Cuba, Puerto Rico, Panama, Hawaii, and the Philippines. If a British naturalist were to try it, an almost inconceivable conglomeration would result.

Evidently these books were among numerous straws which have been in the wind for a good while but to which we have paid little or no attention. The Japanese zoologist is doubtless not especially to blame for them since he only expresses a national inferiority complex which is compelling.

—WILFRED H. OSGOOD

THE FORTITUDE OF TURTLES

The writer recently returned from Havana, Illinois, where he studied the habits of local reptiles and amphibians to supplement his observations made in 1940 at the same place. Through the courtesy of the State Natural History Survey he was given quarters at their Havana Field Laboratory.

The most interesting observations were made one morning from a well concealed position in a fringe of bushes extending along a narrow sand beach of Lake Chautauqua, occupied to discover exactly how soft-shelled turtles construct their nests. A turtle with a shell fully a foot long appeared on the sand and promptly began to dig, using the hind feet alternately and working with clock-like regularity. A boat came by and sent the reptile scurrying into the lake, but it had already dug a square hole nearly two inches across and three deep. The bottom had not yet been enlarged for reception of the round eggs.

The interesting fact is that in making its flask-shaped nest such a turtle performs a

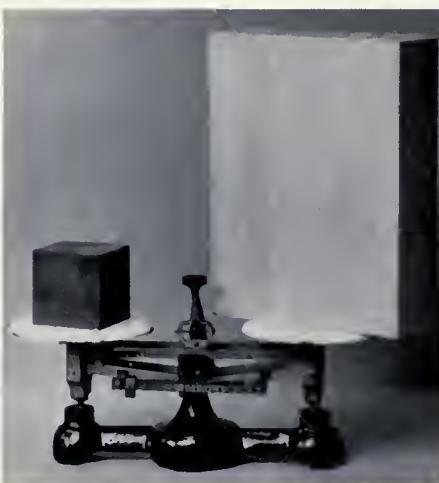
feat comparable to that of a bird building its nest. Neither the bird nor the turtle requires practice, but the bird does use its eyes. The turtle does not do so because its work is hidden by the broad rim of its shell and the head is held erect, the eyes ever on the lookout for the approach of danger. Moreover, the aquatic reptile is working in a strange element; its belly is burned by the hot sand below, its back by the direct rays of the sun above. If anyone doubts the remarkable ability of the soft-shelled turtle, let him blindfold himself and try to dig a flask-shaped hole while lying naked on sand heated to 112° F. in sun that is only a few degrees cooler. Although a reptile is cold-blooded, its tolerance of heat is no greater than that of man. A turtle, being so much smaller, no doubt would succumb to such exposure more quickly than a man.

—CLIFFORD H. POPE

THINGS YOU MAY HAVE MISSED

Contrast in Weight and Volume of Light and Heavy Woods

Among the South American woods in Hall 27, in the case containing a large wheel section of the red quebracho of



SPECIFIC GRAVITY ILLUSTRATED

Remember, as a child, pondering the question "Which weighs more—a ton of feathers or a ton of lead?" The Museum's Department of Botany here demonstrates that a pound of balsa, one of the world's lightest woods, has 11 times the volume of a pound of extremely dense quebracho.

Argentina and Paraguay, two blocks of wood, shown side by side, afford a striking contrast in specific gravity. One of them is a cube of quebracho which is one of the heaviest of all woods; the other is a block of balsa wood, which is one of the very lightest. The two blocks, one of which is much larger than the other, balance each other on the scale. Both weigh one and a quarter pounds, but the balsa block has more than eleven (11.25) times the volume of the quebracho cube.—B.E.D.

"POISON LETTER"

At this season of the year, when city people sally forth to the country on picnics or for tramps through the woods, they sometimes, unless thoroughly familiar with the more offensive features of local natural history, fall into strange traps. Mr. Paul C. Standley, Curator of the Herbarium of Field Museum, recently sat at his desk and read a letter from a woman of Chicago stating that she was enclosing for identification a sprig of a "tree" she had just "discovered," but was unable to place in any of her tree books.

"It is a tall tree with a thick trunk, sending out branches from the lower part of the trunk," she wrote. "What is it?"

Mr. Standley carelessly shook out the leaves from the envelope, and was startled to find in his hand some leaves of *poison ivy*. Although not himself susceptible to the noxious effects of this vine, he wondered through how many other hands the twig had passed before reaching his. Poison ivy, of course, is never a large tree, as described by the correspondent, but is usually, as in this case, a vine climbing up tree trunks by many strong aerial rootlets that hold its stems tightly against the trunk.

In this connection it may be recalled that a few years ago the attention of Field Museum's Department of Botany was called to an ornamental vine trained over the porch of a residence in Chicago. This handsome vine turned out to be—yes—poison ivy!

It is fortunate that probably the majority of people are immune to poisoning from this vine, for it may be found in the midst of the city in vacant lots where small children play every day. Many of these lots are now Victory Gardens, and the ivy, if its roots have not been completely eradicated, may appear among their crops to the peril of the gardeners. It is to be regretted that the aid of the WPA was not invoked during recent years to exterminate the plant in such situations, which might easily have been done by use of chemicals or by simply grubbing the roots from the ground.

AUGUST—SEPTEMBER ISSUES OF NEWS COMBINED

This issue of FIELD MUSEUM NEWS constitutes both the August and September numbers (Vol. 13, Nos. 8-9). The next issue will be that due for publication on October 1.

This suspension for one month is the first interruption in publication that has occurred since the NEWS was inaugurated in January, 1930. It is due to the depletion of the Museum staff for war service and necessarily reduced general activities.

FIELD MUSEUM IN FILM ENTITLED "BACKGROUND OF TOMORROW"

A motion picture crew of fourteen persons, including director, cameramen, technicians, and a cast for incidental acting, spent nearly a week in July making films at Field Mu-



REHEARSING SCENE IN MUSEUM MOVIE

Acting Director Orr Goodsoa (left) and Staff Taxidermist John W. Moyer (right) receive screen instructions from Mr. Bertram Bates, director of the film "Background of Tomorrow," to be released in near future.

seum, both in the exhibition halls and "behind the scenes" in workshops and laboratories. The film, to be released under the title "Background of Tomorrow," is sponsored by the Chicago Association of Commerce for the purpose of publicizing the educational and cultural advantages offered by leading museums of this city. In addition to Field Museum, the film will cover activities of the Art Institute, Museum of Science and Industry, Chicago Historical Society, and Chicago Academy of Sciences. The professional cinema personnel is furnished by the Atlas Educational Film Company, of Oak Park. Mr. Bertram Bates is director, and Mr. John G. Curtis is scenario editor. Many members of Field Museum's staff are shown in the performance of specialized tasks. The film, when completed, will have a sound track carrying a narrative by a well-known radio commentator.

MOTION PICTURES FOR CHILDREN

The final program in the summer series for children by the James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures, will be given on Thursday morning, August 6, at 10 o'clock. This program, called "The Vacation Special," consists entirely of especially selected animated cartoons, and includes films both in color and black-and-white. Titles of the pictures to be shown are: "Little Hiawatha," "Elmer Elephant," "Flying Mouse," "Snubbed by a Snob," "Pedagogical Institution," and "The Ugly Dino." Admission is free, and no tickets are required. Children from all parts of

Chicago and suburbs are invited. Five other such programs were given during July.

Beginning with the first week in October, and continuing throughout November, the annual autumn series of free motion pictures for children will be given on Saturday mornings; details will be announced later.

SUMMER GUIDE-LECTURE TOURS MORNINGS AND AFTERNOONS

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. There are no tours given on Saturdays or Sundays.

By pre-arrangement with the Acting Director, special tours are available to parties of ten or more persons.

NEW MEMBERS

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

Contributors

Charles Edward Brown

Associate Members

Mrs. Michael Blecker, Jr., J. J. Brodsky, Max Holmburger

Annual Members

Alfred T. Abeles, Mrs. Arthur I. Appleton, T. W. Bryant, Albert Busch, Mrs. Frank L. Butz, E. D. Conant, Mrs. Margaret Falkenburg, Dr. Henry Goss, Max Halperin, Mrs. Edward K. Hardy, E. J. Harrigan, Ferdinand L. Hotz, Dr. Leo Houda, J. J. Kingham, James V. Licata, G. A. Millard, J. M. Miller, Harry Prince, Dr. Edmund A. Proby, Mrs. Thomas M. Quigley, Warren Roane, Philip W. Schimmel, James S. Schoff, Walter W. Schrage, James C. Shaw, Theodore Stempel, Mrs. Gordon C. Thorne, Dr. Irving D. Thrasher, Roscoe L. Weiss

Former Preparator Dead

His former associates at Field Museum have received with regret news of the death on July 18 of John William Harrison, who for 35 years was a preparator in the Department of Anthropology. Since April 30, 1940, he had been retired on pension.

GIFTS TO THE MUSEUM DURING PAST MONTH

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

Department of Anthropology:

From Mrs. Broadus Clarke, Chicago—Huaxtec spouted jar with handle, and anthropomorphic figurine of clay with whistle and tripod legs, Mexico; from Richard A. Doubleday, Chicago—a boy's suit, consisting of jacket, trousers, belt, and headdress, Guatemala; from Mrs. Anne Harding Spoehr, Winnetka, Ill.—2 Navajo silver buttons, southwestern United States.

Department of Botany:

From Donald Richards, Chicago—34 specimens of mosses; from Harry Hoogstraal, Urbana, Ill.—15 wood specimens, Mexico; from University of Chicago—2,528 specimens of miscellaneous fungi; from Dr. Edna Snow, Provo, Utah—11 specimens of algae, Utah; from Harry K. Phinney, Cincinnati, Ohio—104 specimens of algae, Michigan.

Department of Geology:

From Dr. Frederick W. Burrey, Evanston, Ill.—31 geological specimens, western United States.

Department of Zoology:

From Dr. Albert W. Herre, Stanford University, Calif.—a sea snake and a sand boa, India; from Harold Higgins, Salt Lake City, Utah—19 lizards and a snake, Samoa; from John H. Crea, Fargo, N. D.—a little bittern, England; from Dr. C. S. Smith, San Marcos, Tex.—3 salamanders, Texas; from E. W. Andrews, Cambridge, Mass.—96 frogs, lizards, and snakes, Yucatan; from Lincoln Park Zoo, Chicago—a stork and a brant, Europe and India; from Henry S. Dybas, Chicago—796 insects and allies, 14 specimens comprising 3 species of land isopods, and 190 specimens comprising 28 species of land shells in 38 lots, Tennessee; from W. E. Eigsti, Chicago—3 shrews, Illinois; from Boardman Conover, Chicago—a ruff, Holland; from Chicago Zoological Society, Brookfield, Ill.—an Indian gallinule and a wild turkey; from Mrs. Edwin S. Cieslak, Chicago—57 garter snake skins, Illinois; from Pvt. Donald M. Kemp, Hawthorne, Nev.—4 lizards and a rattlesnake, Nevada; from Clifford H. Pope and family, Winnetka, Ill.—37 frogs, lizards, turtles, and snakes, Illinois; from Miss Margaret Finerty, Homewood, Ill.—a common mole, Illinois.

The Library:

Valuable books from Stanley Field, Lake Forest, Ill.; from Dr. Henry Field, Washington, D.C.; and from Henry W. Nichols, Elmer S. Riggs, and W. H. Corning, all of Chicago.

Raymond Foundation:

From Dr. Wilfred H. Osgood, Chicago—39 standard size lantern slides; from Turtox Biological Supply House, Chicago—347 kodachrome slides.

Division of Photography:

From Estate of Edmund Heller, San Francisco, Calif.—402 negatives of general views in Central Africa.

Field Museum News

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No. 10

MUSEUM MEN ARE GOOD SOLDIERS BUT LOSS TO SCIENCE IS SEVERE

BY STANLEY FIELD
PRESIDENT OF THE MUSEUM

Field Museum is proud of the part its men are playing in the nation's struggle. Twenty-five men (22 employees, and three Trustees) have gone into various war services, and a number of others are awaiting early calls.

As the normal personnel of the institution totals 208 employees, of whom only 152 are males, the 22 who have left represent a large proportion (more than 14 per cent) of the Museum's manpower. And of these, about two-thirds are men whose work here as scientists and artisans is directly connected with the progress of the basic activities of the Museum. They are men who normally are assigned to expeditions and research, who prepare exhibits, and who conduct the educational activities which are prime considerations in the operation of the Museum. These men could not easily be replaced, even if Museum policy permitted; the other eight men in war service—guards, maintenance workers, etc.—are temporarily replaced in such cases as seem essential. The Trustees have adopted a policy of keeping all positions vacated for war service open for their original holders at the end of the war. The few substitutes necessarily employed are on a temporary basis only, with

the understanding that positions will be surrendered to the returning service men. Further, the Trustees have made provisions enabling returning employees to obtain reinstatement of their full privileges under the Museum Employees' Pension and Group Life Insurance Plans, with no loss of benefits.

Meanwhile, it is good to note that Museum men are achieving notable success in

military life—six Museum employees (as well as the three Trustees) have already received commissions in the Army and Navy. Reports have been received that others in training have attracted the attention of their superior officers and are qualifying to receive promotions in the near future.



Chicago Daily News photo

TWENTY-FIVE STARS NOW ON MUSEUM SERVICE FLAG

President Stanley Field, Ensign Alexander Spoehr (Assistant Curator of North American Ethnology and Archaeology), and Acting Director Orr Goodson watch as Mrs. Spoehr (a Museum artist) sews additional star on flag to represent Henry Horback (on right), Assistant in Geology, as he leaves for his new duties as a member of the United States Army Signal Corps.

The welfare of the Museum itself is severely hampered by this heavy and ever growing depletion of its staff. It is hoped, therefore, that the membership, and the public at large, will understand the necessity of severely reducing all Museum activities. Further expeditions, for example, are out of the question, not only because of lack

(Continued on page 2, column 1.)

STORY OF ANIMAL REPRODUCTION TOLD IN NEW EXHIBIT

BY D. DWIGHT DAVIS
CURATOR OF ANATOMY AND OSTEOLGY

Animal reproduction is the subject of an exhibit recently opened in the Hall of Vertebrate Anatomy (Hall 19). The story of how an egg cell is fertilized, and then gradually develops into an amazingly complex young animal, is told in a special alcove of four cases.

The relatively simple reproduction of animals without sex is illustrated by enlarged models of the ameba, where the whole body of the "parent" simply divides into two. An ostrich egg, which is as large as eighteen hen's eggs, is compared with the scarcely visible human egg to show the striking difference between animals that store food for the young in the egg and those that nourish the young directly from the mother's blood stream. Other enlarged models show the geometrically accurate way in which the single egg divides into two, then four, eight, sixteen, thirty-two, and so on until finally the countless cells resulting from repeated divisions fashion the simple early embryo. Another series of models shows how such organs as the brain, heart, and liver gradually assume their proper form. A set of life-sized hen's eggs, opened to show the embryo, gives a "moving picture" of daily progress in the development of a chick, from the stage of the unincubated egg until

the time of hatching three weeks later.

Frog embryos (tadpoles) differ from bird or mammal embryos in that they lead an active fishlike life for a time, and then suddenly transform into young frogs. Stages in this special type of reproduction are shown in a case of enlarged models. Introduction of the tadpole stage into the reproductive

(Continued on page 5, column 3.)

MUSEUM MEN ARE GOOD SOLDIERS

(Continued from page 1)

of the men to conduct them, but also because of the financial difficulties which Field Museum, in common with other endowed institutions, faces under present-day conditions—and besides, with warfare raging over nearly all the world, it would not be practicable or good judgment to attempt to conduct expeditions in foreign countries. Publications must be curtailed, both because of the depletion of the men to write them, and of Field Museum Press workers to print them. FIELD MUSEUM NEWS will suffer, since reduction of activities in general naturally brings reduction of news, and the depletion of the staff has taken some of the most prolific writers of the feature articles normally published in this periodical. Many of the remaining members of the staff have had to assume additional work, or have had to transfer their energies to branches of work outside their normal duties.

MUSEUM'S CHIEF WARTIME AIMS

There are three principal things which the Museum administration must strive for during the war. First, to keep the Museum open and as nearly normal as possible in its service to the public—this is important both as an element of civilian morale and of maintaining morale among service men stationed in the Chicago area. The second "must" is to give the proper care and attention to the protection and preservation of the Museum's collections, both those on exhibition and the vitally important scientific study collections—these represent an investment of millions of dollars, as well as the time and effort of many scientific pioneers who have conducted expeditions all over the world for years, and their value to the continuance of research after the war is incalculable. Third, earnest efforts must be made to avoid any cessation of the institution's educational projects (both adult and juvenile), particularly those for the benefit of school children, such as the activities of the N. W. Harris Public School Extension, and the James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures.

WORK IMPORTANT TO FUTURE

In times of stress such as the present, it is generally agreed that such work is more important than ever, and that any tendency to minimize efforts in this direction must be combatted energetically. The hope of the world after the war depends upon the children who are growing up today. Museums and kindred institutions have an essential task in preparing these children to live better balanced lives both as individuals and as members of their communities in that better world which we envision, and must establish, if true civilization is to survive after the present world conflict, and if further wars are to be made impossible.

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Military

THEODORE ROOSEVELT, Trustee—Brigadier-General, U.S. Army.
LESTER ARMOUR, Trustee—Lieutenant-Commander, U.S. Navy.
JOSEPH NASH FIELD, Trustee—Lieutenant (Senior Grade), U.S. Navy.
CLIFFORD C. GREGG, Director—Lieutenant Colonel, A.G.D., U.S. Army.
MELVIN A. TRAYLOR, JR., Associate, Birds—Private, U.S. Marine Corps.
DR. JOHN RINALDO, Associate, Southwestern Archaeology—Private, U.S. Army.
DR. SHARAT K. ROY, Curator, Geology—Captain, U.S. Army.
COLIN CAMPBELL SANBORN, Curator, Mammals—Lieutenant (Senior Grade), U.S. Navy.
DR. ALEXANDER SPOEHR, Assistant Curator, North American Ethnology and Archaeology—Ensign, U.S. Navy.
EMMET R. BLAKE, Assistant Curator, Birds—Private, U.S. Army.
RUPERT L. WENZEL, Assistant Curator, Insects—First Lieutenant, U.S. Army.
WILLIAM BEECHER, Temporary Assistant, Department of Zoology—Private, U.S. Army.
HENRY HORBACK, Assistant, Geology—Private, U.S. Army.
FRANK BORYCA, Assistant Preparator, Botany—Private, U.S. Marine Corps.
BERT E. GROVE, Guide-Lecturer—American Field Service, in North Africa.
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JOHN SYCKOWSKI, Guard—Chief Commissary Steward, U.S. Navy.
GEORGE JAHRAND, Guard—Chief Water Tender, U.S. Navy.
M. C. DARNALL, JR., Guard—Seaman 2nd Class, U.S. Coast Guard.
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NICHOLAS REPAR, Printer—First Class Seaman, U.S. Navy.

Other Services

RUDYERD BOULTON, Curator, Birds—Staff of Office of Strategic Services.
BRYANT MATHER, Assistant Curator, Mineralogy—Civil Service Worker for Corps of Engineers, U.S. Army.
JOHN McGINNIS, Guard—U. S. Merchant Marine.

U. S. MARINES, NAVY AND ARMY ALL TAKE MUSEUM WORKERS

Four more men from Field Museum's staff left during August for military service—two into the U. S. Army, one into the Navy, and one into the Marines.

Dr. Sharat K. Roy, Curator of Geology, was commissioned a Captain in the Army, and went into active service August 21. Dr. Roy served as a private with the British Indian Army in the first World War. He joined the staff of Field Museum in 1925. During 1927-28 he spent fifteen months exploring in Newfoundland, Labrador, and Baffin Land as geologist of the Rawson-MacMillan Subarctic Expedition of Field Museum.

Mr. Colin Campbell Sanborn, Curator of Mammals, was commissioned a Lieutenant (Senior Grade) in the U. S. Navy, and began his duties in that capacity on August 31. Although now in the Navy, Mr. Sanborn served with the Army in the last war, when for two years he was a member of the 149th

Field Artillery, Rainbow Division. He joined the staff of the Museum in 1922, and has participated in important expeditions to South America, including the Marshall Field Brazilian Expedition (1926-27), and the Magellanic Expedition (1939-40).

Mr. Henry Horback, Assistant in Geology, enlisted as a private in the Signal Corps of the U. S. Army on August 1.

Mr. Frank Boryca, Assistant Preparator in the Plant Reproduction Laboratories of



LT. C. C. SANBORN CAPT. S. K. ROY

the Department of Botany, enlisted as a private in the U. S. Marines, on August 20.

News occasionally trickles in about Museum men who have been in service for some time past. Mr. Joseph Nash Field, Trustee, was recently promoted to Lieutenant (Senior Grade) in the Navy. Mr. Emmet R. Blake, Curator of Birds, now a private in a medical detachment at Camp Grant, Illinois, was recently chosen "Soldier of the Week." Mr. James C. McIntyre, a Museum guard who entered the Army as a private, has been commissioned as a Second Lieutenant.

NEW EXHIBIT SHOWS THE SOLAR SYSTEM

An elaborate model representing the solar system, and showing the relative positions of the planets, has been placed on exhibition in Clarence Buckingham Hall (Hall 35), Department of Geology. In this exhibit the planets are represented by models carved from a transparent plastic, and these are made attractive by illumination from behind the panel representing outer space. The model was prepared by Mr. Frank H. Letl, specialist in accessories for the Department of Zoology, whose services were lent to the Department of Geology for this purpose. Dr. Sharat K. Roy, Curator of Geology, designed and supervised preparation of the exhibit and prepared the explanatory labels.

On the other side of the same case is an exhibit illustrating the composition of the interior of the earth. This was also designed by Curator Roy, and the carving of the model was done by Mr. Joseph Krstolich, Artist-Preparator in Zoology.

SATURDAY AFTERNOON LECTURES BEGIN; SOME OFFER KNOWLEDGE OF VITAL WAR ZONES

The annual Autumn Course of Free Illustrated Lectures for adults, to be presented at Field Museum on Saturday afternoons during October and November, strikes a nice balance for those who wish to be better informed about regions vital in the war, and those who seek escape from the war by contemplation of happier subjects. About one-half of the lectures to be presented deal with regions appearing in the news of the day, and the rest of the lectures deal with America's own wonderlands and the beauties and curious phenomena of nature. All of the lectures will be illustrated in natural colors, and all but one with motion pictures.

The lectures are to be given in the James Simpson Theatre of the Museum, and all will begin at 2:30 P.M. The demand for seats makes it necessary to restrict admission to adults; for children free motion pictures are given on Saturday mornings.

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

October 3—AMERICAN BIRDS IN COLOR.

Cleveland P. Grant.

Naturalists, and lovers of birds throughout the country, have given the highest praise to the natural color films of American birds, in flight and at rest, made by Mr. Grant. He has devoted years of study and research in remote wildernesses, making his films and the observations upon which his intimately presented lecture is based. Mr. Grant formerly was an extension lecturer of the Raymond Foundation, and later Acting Curator of the N. W. Harris Public School Extension of Field Museum.

October 10—ALASKA AND THE ALEUTIANS.

Ben East.

The giant brown bears of Alaska, largest flesh-eating animals in the world, and the rare Alaskan sea otter, highlight the motion pictures and lecture to be presented by Mr. East, Grand Rapids outdoor writer. He has spent three months this past summer in the remote sections of Alaska, cruising aboard patrol ships of the United States Fish and Wildlife Service. He covered 3,000 miles of the Alaskan coast, including the bleak volcanic Aleutian Islands chain that extends nearly to Asiatic Russia and Japan. The story he tells includes descriptions of the largest seabird colonies in North America. Sea lions, blue foxes, caribou and other animals are shown. The sea otter pictures are among the rarest wildlife films ever shown.

October 17—LIFE'S PAGEANT THROUGH THE AGES.

Charles R. Knight.

Mr. Knight is famous as the foremost artist specializing in the restoration of prehistoric animals and man. One of the largest and most important of his creations is the

series of twenty-eight mural paintings on the walls of Ernest R. Graham Hall of Paleontology at Field Museum, showing extinct animals of various ages through a span of hundreds of millions of years, as science indicates they appeared in life. In his lecture he will tell how he goes about his unusual task of painting animals no man has ever seen alive, and making his restorations accurate in accordance with the best knowledge which scientific research has thus far produced.

October 24—JUNGLE MEN OF DUTCH GUIANA.

Fred Hardenbrook.

When Columbus returned to the court of Queen Isabella after the discovery of

October 31—WESTERN DESERT WONDERLANDS.

John Claire Monteith.

Mr. Monteith is a naturalist who tells an informative story of desert, mountain, and Indian country with superb natural color motion pictures. He has a long line of western pioneers as ancestors, and as a boy he heard the stories of Indian wars as passed down from his great-uncle, Dr. Marcus Whitman, who led the first wagon train over the old Oregon Trail more than 100 years ago. For many years he has conducted research in desert and Indian lore. The struggle of plant and animal life to survive in arid lands; the life zones of plants from below sea level to the land of the pines; and the pollination and growing of dates in



Photo courtesy of John Claire Monteith

LECTURER TO TELL OF "MIRACLE OF RAINS" ON DESERTS

Giant cacti and great fields of strange flowers which successfully struggle to exist in barren waste lands are shown in full color in films accompanying the lecture "Western Desert Wonderlands" to be given at Field Museum October 31.

America, he brought with him red men who called themselves Caribees and are known today as the Carib Indians. Some of their descendants have become civilized, but deep in the jungles of Dutch Guiana live the Ojana tribe of Caribs who have successfully withstood encroaching civilization. They live today as their ancestors did, hundreds of years ago, in palm leaf huts built in jungle clearings. They have no guns, but use bows and long reed arrows, tipped with deadly *curare* poison, both in their hunting and their continual warfare with other tribes.

Fred Hardenbrook with his color camera has recorded their life and customs. By living as they do, eating their food, and observing their religious and tribal customs, he achieved an unusual understanding of the tribe.

America—all are brought to the screen by his films in full and surprising color.

November 7—CEYLON.

Charles Brooke Elliott.

Ceylon, wondrous isle in the sapphire sea, brings to mind exotic pictures of a tropical island, of age-old legends, of beautiful scenery, and a lush jungle life. It is these aspects that Mr. Elliott shows.

Ancient history of Ceylon as written in the Mahawansa—"buried cities" now uncovered—tea, rubber, and coconut industries—lovely gardens, bits of tamed jungle—native animals, including some unusual pictures of elephants at work and play, performing incredible feats of agility—these and many other subjects are featured.

(Continued on page 8, column 3)

DIVING IN A MICHIGAN LAKE FOR MUSEUM MATERIAL

By LEON L. PRAY
STAFF TAXIDERMIST

Preliminary studies, required for a projected preparation of a habitat group showing fresh-water fishes as they appear under water, were completed during August. The first step in this project was made about a year ago when Mr. Loren P. Woods, Assistant Curator of Fishes, Mr. Frank H. Letl, Preparator of Group Accessories, and the writer made a field trip to Magician Lake, in the vicinity of Dowagiac, Michigan. Diving equipment, built by Mr. Ronald Lambert, of Zion, Illinois, and used on the Leon Mandel Expedition to the Galapagos Islands, was employed on this brief reconnoitering trip with gratifying results. Richer weed beds were desired, and after careful deliberation Lake LaGrange in Cass County, Michigan, was decided upon for a 1942 expedition to make final collections.

The Museum was assisted in making arrangements by Mr. and Mrs. Gordon Cole, of Dowagiac. Early on the morning of August 19 we set forth for a two-day trip, with Mr. Lambert and Mrs. Marian Gray added to our original 1941 party, and with Staff Reporter Eddie Doherty and Photographer Leonard Bass, of *The Chicago Sun*, assigned to cover the story.

UNDERWATER SURPRISES

Boats were ready for us on arrival at Lake LaGrange. In short order our party now numbering seven members, was in bathing attire and hard at work with diving helmet and air pump. Between 10 A.M. and dusk many submersions were made. We located rich and varied water plants spread over the floor of the lake in groves, thickets, and extensive forests with deep, open waterways between.

The complete contrast in appearance of the underwater scene from the horizontal view afforded through the wide window of a helmet, as compared to the foreshortened top-water view seen through a glass-bottomed bucket, always impresses new observers. Water that appears to be shoulder deep from the surface turns out to be twelve to eighteen feet deep when one descends with the helmet. Plants that seemed squatly from the boat tower and arch above the diver in grand array.

FISHES STUDY THE DIVERS

While under water, either when walking on the bottom or seated comfortably on a rung of the chain and pipe ladder hung from clamps on the stern of the boat, fishes appeared to lose all fear of us. They came right up to the helmet window, peered in, and looked each diver over from head to foot as though they were consumed with curiosity about us. Fishes to be shown in the proposed group in Hall O will include black bass, pickerel, yellow perch, wall-eyed pike, sunfishes, crappies, bullheads, and minnows.

Outstanding among the plants to be shown are the pond weeds (*Potamogeton*), milfoil (*Myriophyllum*), and hornwort (*Ceratophyllum*). These had a bright green appearance under water. The sunlight filtering through the dense water filled the entire scene with a hazy golden-green.

The footing upon which the plants in a lake grow is rather startling to one making his first few dives in a helmet. Bottoms of weedy lakes and ponds are covered with debris of varying depths, so that the diver may be plodding along easily one minute, only to plunge suddenly into some unsuspected pocket of soft material. Our party found it preferable to use the ladder-seat for underwater study on account of the uncertainty of footing. Stirring up of fine sediment was avoided by riding the ladder a foot or two above the bottom.

Visibility was good in Lake LaGrange. The "water-bloom" of microscopic plants and animals which clouds so many lakes during the earlier part of the summer was at this time rapidly disappearing.

Another day was spent exploring the underwater flora, collecting plants, and making photographs and notes to be used in constructing the Museum's fish group typical of a northern lake.

It will be many months before the group for which these studies were made can be completed. A great deal of detailed work must be done in the preparation of the plant reproductions and the specimens of fishes.

Staff Notes

Dr. Paul S. Martin, Chief Curator of Anthropology, has been appointed Research Associate (with the rank of full professor) in the Department of Anthropology at the University of Chicago. Although continuing his duties at Field Museum, Dr. Martin will from time to time give special lectures for classes at the University, and later will give a special course in museology at the Museum. Dr. Fay-Cooper Cole, Chairman of the Department of Anthropology at the University, has been appointed Research Associate in Malayan Ethnology at Field Museum. These appointments evidence the development of closer co-operation between the University and the Museum.

Mr. John W. Moyer, Staff Taxidermist, has completed the manuscript for the Taxidermy Handbook to be published by the Boy Scouts of America for their Merit Badge Series. Staff Artist Arthur G. Rueckert did the technical drawings, and photographs of several mounted specimens of birds and animals in the Museum's exhibits will be used.

Mr. Llewelyn Williams, Curator of Economic Botany, currently engaged on an

expedition for the Museum and the Venezuelan government, has returned to Caracas after extensive explorations in the interior along the Orinoco and tributary streams.

At the request of Director Floyd Young of the Lincoln Park Zoo, Staff Taxidermist C. J. Albrecht recently performed a "mercy killing" by shooting Deed-A-Day, the zoo's elephant, which was suffering from an incurable ailment. Mr. Albrecht was called upon because of his knowledge of the huge animal's anatomy, and his skill with the rifle, exemplified by the fact that he ended the elephant's life with a single shot.

Mr. J. Francis Macbride, Associate Curator of the Herbarium, recently visited Washington, D.C., to engage in work on the flora of Peru.

MR. ELMER S. RIGGS, CURATOR OF PALEONTOLOGY, RETIRES

Mr. Elmer S. Riggs, Curator of Paleontology, retired from the service of the Museum on September 15. A staff veteran, Mr. Riggs has been associated with the Museum since 1898. Except for a year as Museum Assistant at the University of Kansas, from which he was graduated, Mr. Riggs has spent his entire working career at this museum, coming here shortly after the completion of post-graduate studies at Princeton University. He conducted twelve Museum expeditions in the western United States, two in Canada, and two in Argentina and Bolivia, spending altogether a full four years in the last-named countries. He and the men who worked under his supervision on these expeditions were responsible for collecting a major portion of the Museum's paleontological material, a collection which ranks with the largest and most important in the world. During the course of this work, Mr. Riggs discovered numerous genera and species previously unknown, and his publications upon these are notable in the literature of his science. A farewell tea was given in his honor by the Museum staff on September 14. His colleagues in the Department of Geology presented Mr. Riggs with three large volumes containing the record of his accomplishments during his forty-four years at the Museum.

Amygdules

The principal sources of agate are certain areas of northern Uruguay and southern Brazil. When visited by a Museum expedition in 1929 the largest output was from the Catalan Grande Region of Artigas Province, Uruguay. There the agates come from shallow trenches dug in the stony soil of cattle ranges. The numerous stones are piled and the agates separated. The agates are amygdules, that is, fillings of bubbles which are formed by the escaping steam in cooling and solidifying lava.

EXHIBITS TELL STORY OF CORK, NOW A CRITICAL MATERIAL

BY B. E. DAHLGREEN

CHIEF CURATOR, DEPARTMENT OF BOTANY

Cork is the bark of certain species of small-leaved Old World oaks related to our live oaks. Two principal species are usually distinguished, or one main species (*Quercus suber*), the true cork oak, of which the other is then considered a variety. In addition there are several minor kinds regarded as hybrids of the cork oak and other oaks. They are native in the western Mediterranean region from Tunis through Algeria and Morocco in northern Africa, and in Europe from Greece to the Iberian peninsula and southern France.

The best cork is said to come from Spain, where the cork oak forests, especially those of Catalonia, are famous for their excellent product. The largest acreages of cork oak forest exist, in order of extent, in Algeria, Portugal, Spain, and Morocco. The relatively small quantity of cork grown in southern France is used mostly by the local or near-by wine industry, as is also the still smaller amount produced in Italy. In many places in the general cork region the acreage of true cork oak has been increased, or has been created by planting. The former is true especially of Portugal; the latter is most notable in Sardinia, Corsica, the Balearic Islands, and Sicily.

BEST PRODUCT FROM OLD TREES

The formation of cork bark proceeds rather slowly. Beginning when the tree is about four years old, it increases gradually with the age and diameter of the tree up to 150 years. After that it diminishes steadily until it practically ceases at the age of about 200 years. The cork produced during the first fifteen to twenty years of the existence of the tree is not considered of good quality. It is cracked and irregular due to the considerable change in diameter of the tree during the early years of its existence. When the cork tree has reached a thickness of four to five inches, this so-called virgin cork is carefully removed in order to permit the unobstructed formation of a more even and perfect layer which succeeds it. Eight or ten years later the first actual cork harvest takes place, even that somewhat poorer in quantity and quality than succeeding ones obtained later at similar intervals. The best as well as most abundant cork is formed by trees from 50 to 100 years of age.

To harvest the cork, transverse cuts are made to mark the upper and lower limits of the portion to be removed; also, vertical incisions that may follow main cracks in the bark. Pieces of cork are then carefully loosened and pried off, care being exercised not to injure, by cuts or undue pressure, the underlying cork-forming tissue or cork cambium. If long slabs or boards are desired, full length vertical incisions must be made. In its Hall of Foreign Woods (Hall 27), Field Museum has a large speci-

men of cork bark stripped in one piece with only one vertical slit from the trunk and a part of two lower branches of a cork oak.

Ordinarily the pieces removed are neither very large nor regular. They are usually stacked as they accumulate and allowed to season for some time, then removed to boiling vats where the cork swells and softens. The pieces are then smoothed externally by scraping, sorted according to quality, flattened, and baled for shipment or manufacture.

Relatively small quantities of the best quality cork are converted locally into stoppers and corks, while low-grade cork is



CORK OAK

Specimen showing bark and foliage of a vitally important plant, on exhibition in Hall of Foreign Woods (Hall 27).

used for floats for fishing nets, and similar purposes. The great bulk of cork collected is exported unmanufactured.

Our normal importation of cork of all kinds, including corkwaste, shavings, and refuse, amounted in the last decade to more than 150,000 tons annually. In 1939 the imports diminished to 120,000 tons, and although no later statistics are at hand it may be assumed that with the war's interruption in the flow of international commerce the importation of cork, even from Portugal, has been sharply reduced. With many uses besides that for stoppers and floats, e.g., for linoleum making and insulation, it is becoming increasingly scarce. Cork is now one of the critical war materials of which the small existing stock must be carefully husbanded. The cork oak has, of course, been introduced in the United States and grows well in California, but extensive plantings and considerable lapse of time would be required to produce any large proportion of this country's needs.

An exhibit of cork is found among vegetable raw materials in the northern quarter of Hall 28. A reproduction of a branch of the cork oak has been made by Artist-Preparator Milton Copulos and installed with the cork bark which occupies a case in the center of Hall 27.

ANIMAL REPRODUCTION

(Continued from page 1)

process of frogs has led to one of the most remarkable situations among the backboned animals—tadpoles have undergone an entirely separate and distinct evolution from the evolution of the frogs into which they transform! Tadpoles of various kinds of frogs have developed special protective or feeding devices of their own, or are specially adapted to living in mountain torrents or other peculiar situations. These peculiarities in the reproduction of frogs are depicted in a case of lifelike enlarged models in Hall 18.

The reproduction of mammals, including man, differs in one feature from that of most other animals: in mammals the egg is retained in the mother's body and the embryo develops in these protected surroundings. This improved type of reproduction means that fewer young fall prey to hungry enemies during their most helpless stage. But it also demands special arrangements for nourishing the developing embryo, and what is equally important, for ushering the fully developed baby into the world. Birth is one of the most critical periods in the life of a mammal.

Human reproduction is like that of other mammals, but the details of this complex process are naturally best known in man. For this reason a series of life-sized and enlarged models of the most important stages in the human reproductive process is used to illustrate mammalian reproduction. Special emphasis is placed on the extremely critical birth process: a set of full-size models shows the delicate adjustments that make possible the short trip from the mother's womb to the outside world, and comparison of male and female human pelvises reveals the differences in the bony framework of the latter that this requires. An artistic sculpture of a human baby three weeks old, executed in pink marble by Malvina Hoffman, climaxes the exhibit.

The models illustrating human reproduction were made at the New York Maternity Center under the direction of Dr. R. L. Dickinson. They are a gift to the Museum from the late Charles H. Schweppe. The remaining models were made in the Museum laboratories by Miss Nellie Starkson and Mr. Joseph Krstolich, Artist-Preparators, under the direction of the writer.

The exhibit won the high praise of many members of the medical profession who attended a special showing.

Paleontology Associate Appointed

Dr. Albert A. Dahlberg, former head of the Dental Clinics of Albert Merritt Billings Hospital, and now a well-known practising dentist, has been appointed Research Associate in Paleontology at Field Museum. He is engaged in special research on mammalian dentition.

Field Museum of Natural History

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

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FIELD MUSEUM NEWS

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

MUSEUM-ZOO CO-OPERATION

All good zoo animals go to Field Museum when they die—at least those that die in the Brookfield Zoo. The scientific value of an animal often is just as great after it is dead as while it was alive, and close co-operation between the Museum and the Zoo is designed to extract the maximum value from each specimen.

This program of co-operation dates from the very beginning of the Chicago Zoological Society's Brookfield Zoo. In the intervening years it has proved its worth many times over. The Museum has greatly extended the usefulness of these extremely valuable specimens by acting as a clearing house for those engaged in research in other institutions. Scientists working on special problems in medical schools and universities throughout the city leave "orders" with the Museum for particular animals or parts of animals that they require. As such specimens become available they are routed to the scientist who has requested them. In this way both the Zoo and the Museum are contributing directly to medical research and thus to human welfare. It may seem a long way from a kangaroo in a zoological park to a surgeon's decision in the operating room of a hospital, but the path can sometimes be traced very directly.

The practical difficulties of embalming large animals in the field and transporting them to laboratories where they can be studied are so great that most of our knowl-

edge of the internal structure of these creatures has come from zoo specimens. Some zoos, like that of the London Zoological Society, employ a considerable scientific staff, one of whom, the "prosector," has the duty of making anatomical studies of the rare or otherwise interesting animals that become available for dissection as they die. In the United States the zoological gardens of New York, Washington, and Chicago have allied themselves with the respective museums of natural history, so that the curator of the museum division of anatomy serves as the prosector.

Museum expeditions often bring back live animals, which are deposited in the zoo until they have lived out their life span, when they are returned to the museum. In this way the usefulness of animal specimens is doubled.

The Museum's taxidermists continually refer to the living animals in the zoo to check poses, attitudes, and colors of the animals they are mounting. The result of these studies are obvious when the stiff and unnatural animals that filled the museums of yesterday are compared with the lifelike exhibits of today. Occasionally zoo animals are even used for museum exhibition, and in rare instances an entire group may be made from zoo material. Field Museum's group of emperor penguins, for example, was made from birds brought back by the Third Byrd Antarctic Expedition and deposited in the Brookfield Zoo.

According to an old joke, the packing houses use every scrap of a pig "except the squeal." Field Museum recently received from the Brookfield Zoo a fine specimen of the babirusa (a curious species of pig from the East Indies), and the subsequent history of this animal shows that a rare wild pig may be used up almost as thoroughly for scientific purposes as a domestic porker is for food and commercial by-products. A mold was first made from the babirusa, and from this was prepared the lifelike celluloid model exhibited among the pigs of the world in Hall 15. The anatomy of this extraordinary species was inadequately known, so extensive dissections were made and the results published in the Museum's series of technical scientific publications. Then the skeleton was prepared and filed for future reference in the research collection of skeletons. Finally, organs to which special interest attached were stored with the anatomical collection to make them available for further study by specialists.

In this way co-operation in science extends the horizons of human knowledge.

—D. DWIGHT DAVIS

Of value, and of special interest to students of the Southwest, is Case 8 in Hall 7 which contains Pueblo Indian tools. They are arranged according to period, thus making it easy to trace the development.

LECTURE TOURS IN OCTOBER

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

Thursday, October 1—General Tour; Friday—Why Civilizations Differ From Place to Place (Miss Miriam Wood).

Week beginning October 5: Monday—Animals in Autumn (Miss Elizabeth Best); Tuesday—General Tour; Wednesday—Sugars and Spices (Miss Marie Pabst); Thursday—General Tour; Friday—How the Ancient Egyptians Lived (Miss Miriam Wood).

Week beginning October 12: Monday—Modern People of the Americas (Miss Miriam Wood); Tuesday—General Tour; Wednesday—Plants and Animals Through the Ages (Miss Marie Pabst); Thursday—General Tour; Friday—Game and Fur Bearers (Miss Elizabeth Best).

Week beginning October 19: Monday—Plant Products of Pacific Lands (Miss Marie Pabst); Tuesday—General Tour; Wednesday—Field Museum as a Vital Source of Information (Miss Miriam Wood); Thursday—General Tour; Friday—Animals of the Canal Zone and South American Jungles (Miss Elizabeth Best).

Week beginning October 26: Monday—Men of the Old Stone Age (Miss Miriam Wood); Tuesday—General Tour; Wednesday—Plants Prepare For Winter (Miss Marie Pabst); Thursday—General Tour; Friday—High and Low in the Animal Kingdom (Miss Elizabeth Best).

NEW MEMBERS

The following persons became Members of Field Museum during the period from July 16 to September 8:

Associate Members

Robert B. Ayres, David Borowitz, Freolph A. Cerling, George F. Fisher, J. A. Holmes, John P. Robertson, Sinclair G. Stanley, William G. Taylor, C. C. Whittier.

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SUNDAY LAYMAN LECTURES TO BE RESUMED IN OCTOBER

Mr. Paul G. Dallwig, the Layman Lecturer of Field Museum, will begin his 1942-43 season of Sunday afternoon presentations in October. There will be six lectures this season, the sixth in which Mr. Dallwig has conducted this activity. Lectures will be given in October, November, and December, but not during January, as Mr. Dallwig will then be traveling to fulfill lecture contracts in various parts of the country. He will resume his lectures at the Museum in February, March

Daguerre Studio, Chicago
PAUL G. DALLWIG

and April. The lectures at the Museum are given purely as a public service for which Mr. Dallwig receives no compensation.

On each Sunday during October Mr. Dallwig will present "The Parade of the Races," which in past seasons has always been one of his most popular subjects. This lecture is illustrated with the Races of Mankind sculptures by Malvina Hoffman in Chauncey Keay Memorial Hall, and gives the high spots of a trip around the world in which representatives of all the principal races of mankind, civilized and savage, are encountered.

The subject of the November lectures will be "Gems, Jewels and 'Junk'"; in December, "Mysterious 'Night-Riders' of the Sky"; February, "Digging Up the Caveman's Past"; March, "Who's Who in the Mounted Zoo," and April, "The Romance of Diamonds from Mine to Man."

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 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 accuracy based upon thorough research.

THINGS YOU MAY HAVE MISSED

An Apron of Human Bones

An extremely rare curiosity, once used for mystic purposes, is an ancient apron made of human bones, displayed in Hall 32 in an exhibit illustrating various phases of the weird lamaistic religion of Tibet. Despite a certain gruesome quality inevitably associated with it, this object is truly beautiful, due to its exquisite carving.

Obtained from a temple forbidden to all whom the Lamaists would have regarded as "infidels," this bone apron was once used by the high priests in sacred rites to exorcise and propitiate demons, devils, and evil spirits of various sorts. Objects of this type may seldom be seen by white men—strangers are not permitted to enter such temples, and the sacred treasures are always well guarded.

Forty-one large plaques, all elaborately carved in strange designs from human bones, compose the apron. They are connected by double chains of round and square bone beads. The large pieces are made of thigh bones, and are decorated with grotesque figures representing deities; the small ones bear designs based on various symbols of the lamaistic cult. The carving is notable for its technical excellence, indicating the utmost skill and inspiration on the part of

the artists who fashioned the apron. Marks of wear and tear testify to the antiquity of the specimen.

Exhibited with the apron are many objects made from human skulls and other bones—bowls made of crania and once used for libations in honor of the gods; tambourines made of skullcaps to shake while reciting prayers; trumpets of thigh bones which were blown both to summon and to disperse evil spirits. Preferred for the trumpets were the bones of criminals and persons who had died by violence. Some of the skull bowls from which liquor was poured on altars in tribute to the gods are lined with brass or gilded copper, and are fitted with finely chased metal lids. These often were used also in a peculiar form of



FOR EXORCISING DEMONS

Lama priests of Tibet once used this apron, made of carved human bones, in the performance of their mystic rites. It is now exhibited in Hall 32.

ancestor worship in which a son preserved and honored his father's memory by drinking from the parent's skull on the dead man's birthday anniversaries.

The bone apron was a gift to the Museum from the late Arthur B. Jones; most of the other objects were collected on expeditions conducted by the late Dr. Berthold Laufer, former Curator of Anthropology.

Field Museum Taught Plant Economics Long Before Pacific War

The importance of plant raw material is being spectacularly illustrated at the present time, and is most forcibly underlined by the rubber shortage. Among the natural history museums of the United States, Field Museum alone has, ever since its beginning, developed and maintained extensive collecting of and large public exhibitions of plant raw products and industrial materials from all over the world.

Highly interesting among modern primitive peoples are some of the tribes of New Zealand. Their cultures are especially well represented by exhibits in Hall F of the Department of Anthropology.



A STORY ABOUT EACH OF THE RACES IN THE HALL OF MAN

That is the program at the Sunday afternoon sessions with Paul G. Dallwig, the Layman Lecturer, in October.

FREE MOTION PICTURE SERIES OFFERED FOR CHILDREN

Nine free programs of motion pictures for children are offered in the annual autumn series to be presented at Field Museum on Saturday mornings during October and November 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, etc.

The programs include motion pictures with sound, many in color. As an added feature, there will be animated cartoons on each program. Following is the schedule:

October 3—ANIMAL LIFE.

October 10—FALL OF THE YEAR.

October 17—AUSTRALIA.

October 24—SOUTHWEST INDIANS.

LAILA (*a serial story of Lapland, 1st episode*).

October 31—HOLLAND AND NETHERLANDS EAST INDIES.

LAILA (*2nd episode*).

November 7—FLORIDA.

LAILA (*3rd episode*).

November 14—SOUTH AMERICA.

LAILA (*4th episode*).

November 21—SMILE WITH THE CHILDREN OF CHINA.

LAILA (*final episode*).

November 28—AN ALL-CARTOON PROGRAM.

GIFTS TO THE MUSEUM

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

Department of Anthropology:

From Miss Katherine Pope, Chicago—2 pieces of tapa cloth, Hawaii.

Department of Botany:

From Professor F. Miranda, Chapultepec, Mexico—3 herbarium specimens, Mexico; from Illinois State Museum, Springfield, Ill.—86 herbarium specimens, Illinois; from George L. Fisher, Houston, Tex.—107 herbarium specimens, Texas; from L. J. King, Fresno, Ohio—41 specimens of algae, Ohio; from Dr. Earl E. Sherff, Chicago—59 negatives of plant specimens; from Professor C. W. G. Eifrig, River Forest, Ill.—3,036 herbarium specimens, United States (chiefly Illinois); from Leopold Metzenberg, Chicago—2 coal ball specimens, southern Illinois; from Sister M. Marcelline, Grand Rapids, Mich.—68 herbarium specimens, Michigan; from C. W. Bazuin, Grand Rapids, Mich.—124 herbarium specimens, Michigan; from Dr. M. A. Brannon, Gainesville, Fla.—21 specimens of Myxophyceae, Florida; from Senorita Delia Rabinovich, Buenos Aires, Argentina—27 specimens of Myxophyceae, vicinity of Buenos Aires.

Department of Geology:

From Miss Hazel Deardorff, Rifle, Colo.—3 specimens of Early Eocene mammals, near Rifle, Colorado; from Professor Edward L. Holt, Grand Junction, Colo.—*Apatosaurus metacarpus*, Floy Junction, Utah; from William M. Harris, Mesa, Colo.—4 specimens of Paleocene mammals, Plateau Valley, Mesa County, Colorado; from The Peoples Gas Light and Coke Company, Chicago—4 specimens of coal-tar products; from Robert G. Johnson, Le Grand, Iowa—a specimen of fossil coral, Iowa; from Dr. Childs Frick, Roslyn, Long Island, N. Y.—skull of *Teleoceras* (Early Pliocene), Ainsworth, Nebraska; from James H. Quinn, Chicago—2 specimens of diatomaceous earth, Nebraska; from Robert A. Burton, Evanston, Ill.—5 invertebrate fossils, Illinois; from Ricardo Macedo, Puno, Peru—7 invertebrate fossils, Peru.

Department of Zoology:

From Jerry Cordell, Chicago—90 tiger salamanders, a snake, and a turtle, Illinois and Indiana; from Lincoln Park Zoo, Chicago—2 crocodiles; from E. Ross Allen, Silver Springs, Fla.—a coral snake and eggs, Florida; from Dr. J. O. Peterson, Chicago—a snake, Minnesota; from R. A. Burton, Evanston, Ill.—part of Galapagos fur seal skin; from Luis de la Torre, Highland Park, Ill.—a weasel, Illinois; from Chicago Zoological Society, Brookfield, Ill.—a California sea-lion and an alpaca, California and South America; from Fred Cagle, Carbondale, Ill.—7 frogs, 4 turtles, and 4 lizards, Illinois; from G. A. Darrow, Oak Park, Ill.—15 small mammals, Illinois; from Boardman Conover, Chicago—2 birds, Peru; from D. Dwight Davis, Fritz Haas, and Loren P. Woods, Chicago—46 lots of fresh water invertebrates, comprising 30 species, Illinois; from Henry Dybas, Chicago—4 specimens land isopods, 5 salamanders, and 3 specimens of land shells, Mexico, Tennessee, Colombia; from Professor C. W. G. Eifrig, River Forest, Ill.—a bird skin, a box of bird nests, 2 boxes of birds' eggs, 5 weasel skulls, and a turtle skull, various localities.

The Library:

Valuable books from Stanley Field, Lake Forest, Ill.; from J. Eric Thompson, Harvard, Mass.; from Dr. Henry Field, Washington, D.C.; and from Miss Elizabeth Hambleton, Miss Marie B. Pabst, Dr. Earl E. Sherff, Dr. J. Christian Bay, Elmer S. Riggs, Paul C. Standley, and Miss Celia Ellbogen, all of Chicago.

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.

SATURDAY LECTURES FOR ADULTS

BEGIN IN OCTOBER

(Continued from page 3)

November 14—SOUTH TO CAPE HORN.

Sullivan C. Richardson.

Mr. Richardson and two companions are, to date, the only travelers who have ever covered the length of Latin America, from Rio Grande to Cape Horn, by automobile. In colored motion pictures and lecture, Mr. Richardson tells the story of this trip. The itinerary embraced approximately fifteen thousand miles, much of it through roadless jungle, desert, and mountain wilderness. The expedition, which was made in 1940–41, had for one of its purposes the promotion of inter-American good-will and the construction of the Pan American highway. Impassable trails were conquered by block and tackle and the straining muscles of Indians and bullocks. Many natives along the route saw an automobile for the first time in their lives.

November 21—ASTOUNDING AUSTRALIA.

Dr. John C. Walker.

Dr. Walker's lecture is illustrated by colored motion pictures of the modern city of Sydney with its subway, double-decker busses, electric trains and television tower contrasted with stucco and brick bungalows where the million and a quarter city folk live. Koalas, kangaroos, and kookaburras are "three famous K's" of Australia which the film shows. The emu, fairy penguin, spiny anteater, dingo, cassowary, wallaroo, platypus, and wombat, all peculiar to Australia, are also featured. A thrilling moment for any American audience is to see the Stars and Stripes preceding the men of the U. S. Fleet in Sydney.

November 28—WINGS, FINS, AND ANTLERS.

John H. Storer.

Mr. Storer has developed an avocation into a vocation. His purpose is to spread an interest in the conservation of our wildlife and its environment, our great natural resources of land, water, and forest. His films record 20,000 miles traveled to picture the intimate lives of the birds and animals of eastern North America. Close-ups show the courting and family life of the American egret, with its exquisite plumes, once worth twice their weight in gold. Slow motion close-ups reveal the mechanics of bird flight, the courting dance of the Florida crane, and salmon leaping waterfalls.

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 (WAshington 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.

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OLD WORLD BIRD OF PREY IN NEW HABITAT GROUP

BY WILFRED H. OSGOOD

CURATOR EMERITUS, DEPARTMENT OF ZOOLOGY

In continuation of projects which were under way "before Pearl Harbor," another habitat group of birds has been completed in Hall 20, the west half of which is devoted to Old World subjects. This is a group showing the eagle owl, one of the principal pre-daceous birds of both Europe and Asia.

This owl, which French writers have called "*Le Grand Duc*," is the counterpart of the American great horned owl. It is slightly larger than the American species and at least in some dimensions larger than the snowy owl and the great gray owl. Therefore, it is probably fair to call it the largest of living owls.

It has a very wide range throughout the great coniferous forests of northern Europe and Asia, and through slightly differentiated varieties is represented as far south as Spain, north Africa, and India.

It feeds on rats and mice, squirrels, hares, rabbits, and even young fawns, as well as various birds including especially grouse and pheasants. Often it boldly attacks the great capercaillie or cock-of-the-woods, which is one of the largest of gallinaceous birds.

Like most owls, it is chiefly nocturnal, but may occasionally forage by day, especially in cloudy or stormy weather. At such times, also like other owls, it may encounter harassing evidence of the disesteem in which it is held by smaller birds. Taking advantage of its relatively limited vision, these birds, most commonly crows and jays, band together and pursue it with loud cries and dashing feints. This so-called "mobbing" only results in the discomfiture of the owl and obviously in the satisfaction of the smaller birds which under other

conditions might be its prey. After a spell of glowering and snapping its beak, the owl usually retreats to the depths of the forest.

A mobbing scene is represented in the Museum's group in which a large owl of the Manchurian variety is shown being tormented by Old World jays. The birds were mounted by Staff Taxidermist John W.



THE EAGLE OWL OF EURASIA

A new habitat group in the Hall of Birds (Hall 20) showing a member of the largest extant species of owl, being harassed during its daytime blindness by a "mob" of jays. If the smaller birds approached as closely at night, they might well become the owl's prey.

Moyer, the accessories were made by Preparator Frank H. Letl, and the background was painted by Staff Artist Arthur G. Rueckert. Owing to restrictions on the use of sugar, which has formerly served almost exclusively for making "ersatz" snow, a successful substitute has been produced with soap flakes to which a very small quantity of sugar is added as a binder. This is sprinkled with a cellulose product, "wood flour."

"PEKING MAN'S" TOOLS SHOWN IN A NEW EXHIBIT

BY C. MARTIN WILBUR

CURATOR OF CHINESE ARCHAEOLOGY AND ETHNOLOGY

On October 20 the following United Press dispatch appeared in *The Chicago Sun*: "JAPANESE CAPTURE 'PEKING MAN' 4,000 CENTURIES TOO LATE

"Chungking, October 19.

—(UP)—The famous "Peking Man" skull, believed by anthropologists to be 400,000 years old, has been seized by the Japanese and sent to Tokyo, according to information received from Peiping (Peking) today.

"The skull, known academically as *Sinanthropus pekinensis*, had disappeared from its case at Union Medical College, a Rockefeller-endowed institution.

"The skull, complete with jaws, was hailed as one of the modern world's greatest archeological discoveries when it was excavated at Choukoutien, near Peiping."

Twenty years ago it was hardly suspected that man in China went through the phases of human culture known as the Old Stone Age. Now "Peking man," discovered in 1926, is recognized as one of the very earliest humans, and it is also virtually certain that he used the stone tools and sat beside the hearths that have been unearthed with his skeletal remains. Some of "Peking man's" crude stone tools, and casts of others, are now on display at Field Museum for the first

time in a new exhibit devoted to China's Old Stone Age in George T. and Frances Gaylord Smith Hall (Hall 24, Case A). This exhibit shows typical stone tools from six Paleolithic sites in China, and explains in graphic fashion their presumed chronological sequence. A feature of the exhibit is a group of photographs, prepared by Mr. Millard Rogers, to show how stone tools might have been used. Also, on exhibition

in Case No. 1 of the Hall of the Stone Age of the Old World (Hall C) are casts and photographs of the "Peking man" skull. The casts were presented to the Museum several years ago by the Cenozoic Research Laboratory of Peking Union Medical College.

The site in which "Peking man" was found, near Chou Kou Tien, some ninety miles southwest of Peking, has also produced evidence of at least two other early cultures. The tools that characterize one of them (found in Locality I5) are technically more advanced than the ones that "Peking man" probably used. One typical tool is a large chopper made from a split boulder that was roughly

chipped to form a good hacking edge. Other novelties, not possessed by "Peking man," are points and scrapers made from flakes of stone. The geological and paleontological evidence indicates that man at Locality 15 lived during a later age than "Peking man," but since no skeletal remains were found it is uncertain what species of man he was. Thus we may be dealing with an advanced stage of "Peking man's" culture, or with the culture of a different species of man. (The possibility that "Peking man" never died out, but that his strain still exists in the Mongoloid division of mankind, is a theory recently advanced by Professor Franz Weidenreich, the leading student of the subject.)

DIM REACHES OF THE PAST

Both these cultures are exceedingly ancient—so remote, indeed, that their age must be reckoned by geological standards in hundreds of thousands of years. A middle period of the Old Stone Age was discovered in 1923 by Père Teilhard de Chardin and Père Licent at two places in the badlands of northwestern China. At Shui Tung Kou in Suiyuan province, the two explorers found great quantities of crude stone tools in ancient camp sites that were buried under forty feet of wind-deposited loess soil. This thick layer had been covered, thousands of years later, by gravel and mud dropped by a river that made its course on top of the loess. Man was evidently living in this region before the formation of the loess. These geological conditions, and the fossilized bones of extinct animals found with the stone tools, warrant assumptions as to their great age. The tools are somewhat like those used by man in Europe during the Mousterian and Aurignacian periods, 50,000 and 30,000 years ago. In a site named



"PEKING MAN"
Restoration by Mrs. Lucille Swann, in anthropological reference collection.

Sjara Osso Gol, one hundred and fifty miles farther east, Pères Teilhard and Licent discovered another culture characterized by tiny stone tools (called microliths) mingled with a vast accumulation of the broken and fossilized bones of such animals as the woolly rhinoceros, elephant, gazelle, camel, cave hyena, and giant deer, and with the shells of ancient ostrich eggs. Père Teilhard later presented to Field Museum a sample collection of the tools from each of these now classic sites, and they are displayed as types from the Middle period of the Old Stone Age in China.

The next culture in the sequence that has so far been discovered was again located at Chou Kou Tien, but the man who there inhabited the "Upper Cave" was of the modern species of man (*Homo sapiens*), very different from "Peking man" (*Sinanthropus pekinensis*). The discovery of carved bones and other ornamental objects such as stone beads, pierced shells and animal teeth, and the finding of a bone needle indicate that this man had reached an advanced stage of Stone Age culture. He practiced such modern habits as cooking, trading, wearing sewed skin clothing and "jewelry," and conducting funeral rites for the dead. Judging from the animal bones found mixed in the site, and from the way the inhabitants made their stone tools, the "Upper Cave" culture is classified as Late in the Old Stone Age, perhaps an eastern equivalent of the Late Magdalenian stage in Europe, which lasted until about 10,000 years ago. All the specimens and reproductions from Chou Kou Tien were presented to Field Museum by Dr. W. C. Pei of the Cenozoic Research Laboratory in Peking.

GOBI DESERT LESS LIVABLE TODAY

Throughout Mongolia many Stone Age sites have been discovered, but the wind-eroded steppe and semi-desert terrain have eliminated most of the evidence of geology, associated animal remains, and stratigraphy, which archaeologists use as an aid in determining the age of Paleolithic cultures. By careful analysis of an enormous collection gathered on two of the Central Asiatic Expeditions of the American Museum of Natural History, Dr. N. C. Nelson concludes that Mongolian sites reveal a continuous sequence of cultures from Middle Paleolithic through the New Stone Age. From the large number of sites and the vast accumulation of worked stone that have been discovered in Mongolia, it is apparent that the Gobi desert and its border regions were more hospitable to man in former times than now, and that they were inhabited for a very long time without major interruptions. Among the specimens from eastern Mongolia presented to Field Museum by the American Museum of Natural History, and now on display, there is a heavily patinated stone chopper of a form belonging to the Middle part of the Old

Stone Age. There are also many fine flint tools which have been delicately chipped by means of a technique that was a relatively recent accomplishment of Old Stone Age man. Finally, there are fragments of pottery and a stone bar for grinding seeds or grain, which are evidences of Neolithic culture. These Neolithic artifacts serve to link the newly installed Old Stone Age exhibit with another one being planned to show materials from China's New Stone Age.

LIBRARY OF PHOTOGRAPHS SHOWS RACIAL TYPES

Since the foundation of the Museum, nearly fifty years ago, members of expeditions have photographed racial types on every continent. Special studies on the physical characters of the peoples of the world were begun when the final plans were approved for the Hall of the Races of Mankind (Chauncey Kepp Memorial Hall). Miss Malvina Hoffman, the sculptor commissioned to make the series of bronze figures of racial types in that hall, was requested to compile a photographic record of all peoples visited during her trip around the world for the Museum. A curator selected prints of racial types from museums, pictorial services, and newspaper files in the United States and in England, France, Belgium, Holland, Denmark, Norway, Sweden, Germany, Austria, Hungary, Yugoslavia, Switzerland, Italy, and Spain. Thus was created the Library of Racial Photographs.

The 9,000 prints, which have been mounted on large cardboard sheets, are arranged geographically in steel files in the Department of Anthropology (Room 39), where they are available to the student. As this unique collection has become known, many of these photographs have been selected for text-books and new editions of encyclopedias. This Library is thus far only about half complete, however.

Although the reader may be more familiar with the knowledge of the existence of the casting files in Hollywood used for selecting an individual to fill a special role, and the millions of photographs of criminals in the Federal Bureau of Investigation and in local police departments, the Library of Racial Photographs is of truly permanent scientific value to anthropologists.

After such small groups as the Andamanese, the Bushmen of the Kalahari Desert, the Vedda of Ceylon, and the hairy Ainu of Japan have died out, nothing but the pictorial record will remain. A shining example stands before us. The last survivor of the Tasmanians, a most interesting primitive stock, died in 1877. No adequate series of photographs is available. With modern photographic equipment and subsequent recording on microfilm there is every reason for preserving such documentary evidence for future anthropologists and students of mankind all over the world. —H.F.

BARYLAMBDA, ONE OF THE EARLIEST LARGE MAMMALS, ADDED TO PALEONTOLOGICAL HALL

BY BRYAN PATTERSON
ACTING CURATOR OF PALEONTOLOGY

A skeleton of *Barylambda*, an extinct hooved mammal of unusual interest, has recently been reinstalled in Ernest R. Graham Hall (Hall 38) by Mr. James H. Quinn, Chief Preparator in Paleontology. Unlike and unrelated to any present day animal, it lived some 50,000,000 years ago in what is now west-central Colorado. The skeleton was collected by a Museum expedition in 1933.

Barylambda was one of the most heavily-built animals of all time, standing some four feet high, with an over-all length of about eight and a half feet, and with a width across the hips almost equal to three-quarters of its height. Its bones were extraordinarily massive, indicating the possession of immense muscular power. The head was small in comparison to the size of the body, the legs terminated in broad, spreading, five-toed feet, and the tail was long, large and somewhat flattened from side to side. A realistic restoration painting by Mr. John Conrad Hansen accompanies the exhibited skeleton. This painting, reproduced in the figure, shows an animal that is, as a whole, decidedly unfamiliar to modern eyes, although there is a vague suggestion of the bear in its trunk and legs.

EXTINCT ANIMAL'S HABITS DEDUCED

A reasonably accurate estimate of the habits of an extinct animal can usually be formed from an adequate knowledge of its skeleton and from study of the conditions under which the rocks in which it was found were laid down. In this case the skeleton was found in a formation of mud-stone containing many stream channel deposits of sandstone and some silty layers. This indicates that west-central Colorado was at that time a broad flood-plain with rivers and streams from the Rocky Mountains (lower than now) meandering back and forth across it, laying down sheets of mud in times of flood. Numerous concentrations of crocodile, turtle, and gar-pike bones occurring in the formation demonstrate the former presence of standing water in the form of cut-offs, ponds, and small lakes. The climate was evidently warm and the vegetation heavy. *Barylambda* was well fitted for such an environment. The powerful body was admirably adapted to forcing a way through the tangled vegetation of river-bottom areas, while the broad, spreading feet were suited to supporting its great weight on soft, treacherous ground. The very large, compressed tail strongly suggests that the animal was a capable swimmer almost as much at home in the water as on the land. The low-crowned teeth were fitted for a diet of the soft, succulent vegetation undoubtedly abundant at that time.

About ten million years before *Barylambda*'s day, there had occurred the great-

est revolution of life that the earth has seen. The "Age of Reptiles" had come to a close with the passing of the dinosaurs and other giant reptiles that had dominated land and sea throughout that vast stretch of time. This dramatic and world-wide extinction had ushered in the opening epoch of the "Age of Mammals"—the Paleocene, in the latter part of which *Barylambda* lived.

FIRST MAMMALS WERE SMALL

At the beginning of this epoch the known mammals were of small to medium size, a carry-over from the decidedly subordinate

of medium to large size—a structural limitation which precluded such evolutionary trends as the development of flesh-eating, tree-climbing, or burrowing forms—they achieved a notable degree of diversification, which seems to have reached a climax in late Paleocene time.

A LOST POTENTIAL "TRUFFLE HOUND"

Haplolambda, a contemporary of and similar in general appearance to *Barylambda*, was rather more slender in the legs and had a less massive tail. *Sparactolambda*, another contemporary, was one of the most extra-



Restoration by John Conrad Hansen

ONE OF THE EARLIEST OF LARGE MAMMALS

Barylambda faberi, reconstructed by an artist to show how it must have appeared in life according to the evidence furnished by Field Museum scientists. The animal, unrelated to any modern creatures, lived in Colorado 50,000,000 years ago.

role they appear to have played during the Age of Reptiles. Once they had succeeded to the position of dominance, however, diversification and specialization along many lines went on rapidly, resulting finally in the animal world we know today. One of these lines of specialization was the acquisition of large size, an evolutionary trend that has especially characterized various orders of the great hooved mammal stock. The familiar living examples, such as elephants, rhinos, and hippos, have been preceded by a great variety of extinct groups, of which *Barylambda* and its relatives—comprising the order Pantodonta—were the earliest.

HOW DIVERSIFICATION OCCURS

All groups of animals tend to occupy as many different habitats as circumstances and their structures will permit; the more vigorous and successful the group, the more habitats it occupies and the more diversified its members become. The pantodonts were no exception. Within the bounds imposed by the fact that they were hooved mammals

ordinary of mammals. It was considerably smaller and much lighter in build than *Barylambda*, and possessed a normal tail and a proportionately larger head. The peculiar features center in the structure of the teeth and feet. The latter were five-toed and terminated in blunt claws—decidedly odd equipment for a member of the hooved mammal stock. The upper canine or "eye tooth" was a greatly enlarged, downwardly projecting, dagger-like tusk; while the lower canine was altogether unique in structure and consisted of a sharply pointed hook in front followed by a long, blade-like part behind. A reasonable interpretation of this remarkable combination of characters seems to be that the animal fed to a large extent on underground roots and tubers. These were laid bare by the claws, caught up by the hooks of the lower canines, further uprooted by pulling and jerking movements of the head and neck, and sliced off by the upper canines cutting against the blades of the lowers. As a colleague

once remarked, it is a pity that *Sparactolambda* became extinct; it would have made such an admirable "truffle hound."

It is an interesting fact that claw-bearing forms with presumably similar habits have independently been evolved in two other orders of hoofed mammals—in an extinct family distantly related to the horses, and in an extinct South American group. Representative skeletons of both of these are on exhibition in Hall 38.

In the Eocene, the epoch that followed the Paleocene, the pantodonts declined in importance. *Coryphodon* of North America and western Europe, a form which resembled *Sparactolambda* in general build although lacking the peculiar specializations of its Paleocene relative, is the only known representative of the order in the early part of the epoch. It was the first of the group to be discovered, the original specimen having been dredged up off the east coast of England more than a hundred years ago. Relatives of *Coryphodon* lingered on in Mongolia until Oligocene time, some 25,000,000 years ago, anachronisms from an earlier stage of earth history in a mammalian world that was fast assuming a modern aspect.

Most of our knowledge of the remarkable Paleocene forms has been gained from specimens collected by Field Museum expeditions to western Colorado which have followed up discoveries by enthusiastic and able amateur collectors of that region, notably Mr. Edwin B. Faber and Mr. Alfred A. Look, of Grand Junction. The finding, last year, of an extensive deposit of *Coryphodon* bones has provided extensive material of this early Eocene form, with the result that the Museum now possesses an unrivaled representation of this interesting group of extinct mammals.

MANGANESE ORE

Manganese ore is a vital strategic material essential for the prosecution of the war. For every ton of steel made, fourteen or fifteen pounds of a rich alloy of manganese and iron equivalent to thirty pounds or more of rich ore must be consumed to purify the metal.

By the methods now in use, this alloy can be made only from rich ore, of which but little is found in this country. Last year 97 per cent of the manganese ore consumed was imported from Russia, Africa, India, Cuba, Brazil, and, in smaller quantities, from other places. While by far the largest quantity was used for conditioning steel, much goes into alloys and other compounds of great strategic importance, and the uses of manganese for promoting civilian comfort and convenience are many.

Fortunately, although but little of the richest ore has been found here, there are abundant supplies of ore of lower grade ample for all our needs if only we knew

how to use them. The metallurgists of the Bureau of Mines and some others have now devised several ways of economically handling these low grade ores, and as soon as the needed plants for treating them can be built—which unfortunately will take considerable time—the United States will be independent of foreign supplies.

Manganese is seventeenth in abundance of the elements composing the crust of the earth (only aluminum and iron among the common metals are present in larger quantity). It is widely disseminated and present in small quantity in most soils and rocks, but segregations of manganese minerals rich enough to be ores are less common than might be expected. Nearly all the ores are dark brown to black mixtures of oxides of the metal. Their appearance is so commonplace that they may easily be mistaken for worthless rock. Many of them are shown in the ore collections in Frederick J. V. Skiff Hall (Hall 37). —H.W.N.

THINGS YOU MAY HAVE MISSED

"Spiritual Aids to Navigation" in Solomon Islands

Radio direction finders, periscopes, and other modern aids to aviation and navigation are commonplace in the Solomon Islands area since the navies and air forces of the United States and Japan have come into conflict with each other there.

However, the primitive natives of these islands, who make long voyages in their large war and trading canoes, place their faith in spiritual aids to navigation, some of which are on exhibition in Case 42 of Joseph N. Field Hall (Hall A) at Field Museum. These are grotesquely carved wooden figures in semi-human form. They are placed on the bow of a canoe, just above the water line, in a position in which they seem to peer down into and through the water with vigilant eyes that never blink from fatigue. The Solomon Islanders regard these images as representatives of a protecting deity, a spirit which is supposed to watch for reefs, rocks, and all other hidden



PACIFIC ISLANDERS' PILOT

Carved wooden deity which, when mounted on canoe prow, is credited with protecting Solomon Island navigators from perils of the sea.

dangers of the sea, and to guide the vessel away from such perils.

The natives place the same confidence in these inanimate lookouts that we place in living seamen, especially trained to watch and listen from forepeaks and crow's-nests, aided by the most up-to-date mechanical devices to locate the approach of enemy submarines and airplanes. Apparently Nature, at her worst, although she must frequently have betrayed them, has never disillusioned the natives in their faith, but probably man's warfare today may change their minds as to the infallibility of their spirit-imbued wooden protectors.

MUSEUM WORKERS' FAMILIES HAVE 65 KIN IN WAR

Some idea of the impact of the war on the human resources of a group of average American families is revealed by a survey of the personnel of Field Museum. Because the Museum personnel embraces one of the widest assortments of occupations and professions possible in a group of its size, ranging from scientists and technicians in many specialized branches, to "white collar" workers of various kinds, and both skilled and unskilled labor, it is felt that they represent a fair cross-section segment, typical on a small scale, of the general urban population.

In the survey conducted it was found that, in addition to 23 Museum employees out of a total of 208 who have left for war service, the remaining 185 employees have 42 close blood relatives in the Army, Navy, Marine Corps and Coast Guard—21 sons, 19 brothers, and two sisters (one an army nurse, and one a WAAC member).

Thus, combining the 23 employees and the 42 close relatives, the 208 families represented in the Museum personnel have contributed 63 men and two women, or a total of 65 persons to war service. Of the 208 families, six each have two men in service, and one has four. The total number of families directly affected is 56 or 27 per cent.

Of the 65 in service, 21 have commissions in Army, Navy, or Marine Corps, 41 are enlisted personnel, and three are in special categories. The Army has 36 of the group, the Navy 17, the Marines 6, the Coast Guard 4, the Merchant Marine one, and the Office of Strategic Services one.

TRAYLOR AND RINALDO PROMOTED

Mr. Melvin A. Traylor, Jr., Associate in Ornithology at Field Museum, who enlisted in the U. S. Marine Corps three months before Pearl Harbor, and was soon promoted from Private to Corporal, has now been commissioned as a Second Lieutenant, according to advices from the Marine Corps.

Mr. John B. Rinaldo, Associate in Southwestern Archaeology, who has been in the U. S. Army for more than a year, has been promoted from the rank of private to that of Staff Sergeant.

"GEMS AND JEWELS" SUBJECT OF SUNDAY LECTURES

Where gems come from, what makes them valuable, what superstitions and legends surround each of them, how to tell synthetic stones from genuine ones—these and many other topics will be included in the lecture, "Gems, Jewels and 'Junk,'" to be presented each Sunday afternoon during November by Mr. Paul G. Dallwig, the Layman Lecturer. The lecture will be illustrated with the notable collections displayed in H. N. Higinbotham Hall, and in other halls of the Department of Geology.

The Sunday afternoon Layman Lectures begin promptly at 2 P.M. The heavy demand by the public, 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).

MUSEUM AIMS TO AID PARENTS AND END A TABOO

A description of Field Museum's new series of exhibits illustrating the subjects of animal reproduction and embryological development (recently installed in a special alcove of the Hall of Vertebrate Anatomy—Hall 19) appeared in the October issue of FIELD MUSEUM NEWS. The writer, Mr. D. Dwight Davis, Curator of Anatomy and Osteology, confined himself to telling what the exhibit contained—he did not stress the underlying educational purpose of the exhibit. That this purpose needs stressing, and that there is still considerable public reluctance to discuss the phenomena of birth as a normal and natural part of life in which everyone should receive proper fundamental instruction, is indicated by the reception accorded to a Museum press release about this exhibit. Only two local newspapers, *The Chicago Sun* and the *Chicago Herald-American*, published the announcement.

Inasmuch as people today pride themselves upon their "modernity," enlightenment, and broad-mindedness, the administration of Field Museum feels that the subject of this exhibit deserves intelligent presentation, and that knowledge about it should be disseminated.

Sooner or later, every father or mother is confronted by his offspring with the question, "Where do babies come from?" And even today the average parent, himself the victim of inhibitions which should not be implanted in the minds of boys and girls, sweats and ponders and reluctantly answers, if at all, with devious stories about the flowers and bees, and other roundabout and largely irrelevant devices. The result is that the child's perfectly proper and natural curiosity remains unsatisfied, and

the parent cannot help but be embarrassed by the realization of his own intellectual dishonesty. Thus a psychological barrier has been erected against true confidences between parent and child in the future. The parents are not in most cases to be blamed, however—most of them are simply not equipped to do this job. It is a task properly falling within the province of teaching, and the average parent has



Photograph courtesy of the Chicago Herald-American

"IDEAL BABY" REPRESENTED

Mrs. LaVerne Drake, a Museum visitor, admires sculpture by Malvina Hoffman of a physically perfect child of three weeks in exhibit illustrating embryological development.

neither the knowledge nor the skill of expression to fulfill this important requirement adequately.

That is why Field Museum has now come to the rescue of such parents with this new series of exhibits that by-passes parental reluctance and inability, and tells the children the "facts of life" in a frank, honest, modern manner. The exhibit is easily understood, and at the same time it has the accuracy and dignity of science. The presentation of the subject is graphic, sufficiently comprehensive, and satisfactorily definite. It answers all the principal questions which are apt to occur to a child. At the same time, it disassociates the reproductive process from the realm of "things we don't talk about," and raises it to the level of things we can, should, must, and do think and talk about. Parents will find it a practical solution of their dilemma to inspect this exhibit together with their children—and, as a matter of fact, most of the parents themselves will thereby gain much more exact knowledge than they previously possessed.

Change in Visiting Hours

Effective November 1, and continuing until February 28, winter visiting hours—9 A.M. to 4 P.M.—will be observed on weekdays; 9 A.M. to 5 P.M. on Sundays.

FOUR MORE SATURDAY LECTURES IN COURSE FOR ADULTS

The final four lectures in the free autumn course for adults on Saturday afternoons will be given during November in the James Simpson Theatre of Field Museum. All will be illustrated with motion pictures in natural colors. Lectures begin at 2:30 P.M. Following are the dates, subjects, and speakers:

November 7—CEYLON.

Charles Brooke Elliott.

November 14—SOUTH TO CAPE HORN.

Sullivan C. Richardson.

November 21—ASTOUNDING AUSTRALIA.

Dr. John C. Walker.

November 28—WINGS, FINS, AND ANTLERS.

John H. Storer.

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.

FILM PROGRAMS FOR CHILDREN CONTINUE IN NOVEMBER

On Saturday mornings during November the James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures will give the final four programs in its autumn series for children at Field Museum. These programs, to which children from all parts of Chicago and suburbs are invited, and to which admission is free, are presented twice each Saturday morning, at 10 o'clock and at 11, in the James Simpson Theatre of the Museum. No tickets are needed. Children may come alone, accompanied by adults, or in groups from schools, community centers, etc. In addition to natural color talking motion pictures, each program includes an animated cartoon. Following are the dates and titles:

November 7—FLORIDA.

LAILA (A serial story of Lapland, 3rd episode).

November 14—SOUTH AMERICA.

LAILA (4th episode).

November 21—SMILE WITH THE CHILDREN OF CHINA.

LAILA (final episode).

November 28—AN ALL-CARTOON PROGRAM.

The result of much research is Case 7-A, Hall 7, where Southwest pottery types are mounted according to branch and year level. It presents a clear and fascinating picture of the growth of southwestern pottery.

Field Museum of Natural History

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

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FIELD MUSEUM NEWS

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

QUO VADIMUS?

The wisecrack that "an optimist is one who thinks the future is uncertain" is the flippant recognition of an all too evident condition. No one expects the postwar world to come "back to normalcy," and universities, museums and other endowed institutions have especial reasons to consider how they will be affected by new economic and social conditions. Such institutions for some time past have experienced increasing difficulty in making ends meet. Some have actually "folded up," many have made drastic retrenchment, others have eaten into their capital or conducted disappointing "drives," and others, like Field Museum, have found gradual accretions to capital only sufficient to offset diminished returns due to prevailing low interest rates. Meanwhile, increasingly high taxation and general economic uncertainty do not brighten the prospect for private contributions in spite of reports that totals of relatively small gifts have been fairly large in recent years.

These conditions have arisen at a time when public appreciation of the services rendered by museums is greater than ever before, when museum technique has reached a high degree of perfection, and when the future calls for something more than either guns or butter. It is inconceivable that research and education are due to decline, for they have a basic relation to the ideals we fight for. Nevertheless, the fear is now frequently expressed, especially by the

privately endowed universities, that they may be supplanted by state or nationally supported institutions, or that they may be so subjected to hampering regulations as to defeat their highest functions.

Speaking for the privately endowed universities, President Robert Maynard Hutchins of the University of Chicago has said, "They will succeed and maintain themselves only if they think with greater clarity and act with greater courage than the public colleges and universities," and, "I can think of no important idea or movement in American higher education in the last 75 years which did not originate in the endowed universities.... They are in a better position to try out new ideas, maintain academic freedom, set high standards, keep the gaze of the entire educational system directed at its proper objective."

The case for the museums might be stated in almost the same terms. Possibly we are to be purified by war, so to speak. If we have any dry rot, its elimination may be a condition of survival. A little soul searching may be salutary, and with better defined aims, more careful organization, and a rigid adherence to high standards, perhaps the future can be trusted to take care of itself. "Sweet are the uses of adversity!"

Like the universities, the privately endowed museums have set the pace in their field. But for them, progress would be much slower, and probably it is not too much to say that but for them governmentally controlled museums would now be scarcely less dry and stodgy than they were fifty years ago. New ideas, new techniques and methods, new approaches to the public, and most of the advances in research and exploration have been due to the independent museums. Temporary curtailment of their activities may be unavoidable, but to deprive them of their freedom would be to take the leaven from the lump.

—W.H.O.

SATURDAY AFTERNOONS ADDED TO GUIDE-LECTURE SCHEDULE

Beginning in November, guide-lecture tours, hitherto offered only on five days a week, will be given on six days, Saturday afternoons having been added to the schedule for the first time. The Saturday tours will be given at 2 P.M. as are the lectures on other days. In November there are lectures every day of each week—guide-lectures daily except Sundays; Saturday afternoon lectures in the James Simpson Theatre, and on Sundays the Layman Lectures by Mr. Paul G. Dallwig. There will be no tour on Thursday, November 26, on account of the Thanksgiving holiday, but the Museum will be open to visitors during the usual hours, 9 A.M. to 4 P.M.

On Mondays, Tuesdays, Thursdays, and Saturdays, general tours are given, covering outstanding features of all four departments—Anthropology, Botany, Geology, and

Zoology. Special subjects are offered on Wednesdays and Fridays; the schedule of these follows:

Wednesday, Nov. 4—Gems and Their Histories (Miss Marie Pabst).

Friday, Nov. 6—Animals Found Around Chicago (Miss Elizabeth Best).

Wednesday, Nov. 11—The Races of Man (Miss Miriam Wood).

Friday, Nov. 13—Primitive Man's Superstitions and Beliefs (Miss Miriam Wood).

Wednesday, Nov. 18—Ways in Which Animals Protect Themselves (Miss Elizabeth Best).

Friday, Nov. 20—Expeditions Into the Past (Miss Miriam Wood).

Wednesday, Nov. 25—Thanksgiving Foods (Miss Marie Pabst).

Friday, Nov. 27—Life in the Waters (Miss Elizabeth Best).

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

FIELD MUSEUM HONOR ROLL

Now in the Nation's Service:

Military

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MELVIN A. TRAYLOR, Jr., Associate, Birds—Second Lieutenant, U.S. Marine Corps.

DR. JOHN RINALDO, Associate, Southwestern Archaeology—Staff Sergeant, U.S. Army.

DR. SHARAT K. ROY, Curator, Geology—Captain, U.S. Army.

COLIN CAMPBELL SANBORN, Curator, Mammals—Lieutenant (Senior Grade), U.S. Navy.

DR. ALEXANDER SPOEHR, Assistant Curator, North American Ethnology and Archaeology—Ensign, U.S. Navy.

EMMET R. BLAKE, Assistant Curator, Birds—Corporal, U.S. Army.

RUPERT L. WENZEL, Assistant Curator, Insects—First Lieutenant, U.S. Army.

WILLIAM BEECHER, Temporary Assistant, Department of Zoology—Private, U.S. Army.

HENRY HORAACK, Assistant, Geology—Private, U.S. Army.

FRANK BORYCA, Assistant Preparator, Botany—Private, U.S. Marine Corps.

BERT E. GROVE, Guide-Lecturer—American Field Service, in North Africa.

PATRICK T. MCENERY, Guard—Master-at-arms, U.S. Navy.

JOHN SYCKOWSKI, Guard—Chief Commissary Steward, U.S. Navy.

GEORGE JAHRAND, Guard—Chief Water Tender, U.S. Navy.

M. C. DARNALL, Jr., Guard—Seaman 2nd Class, U.S. Coast Guard.

JAMES C. MCINTYRE, Guard—Second Lieutenant U.S. Army.

CLYDE JAMES NASH, Guard—Chief Gunner's Mate, U.S. Navy.

NICHOLAS REPAR, Printer—Seaman 1st Class, U.S. Navy.

Other Services

RUDYERD BOULTON, Curator, Birds—Staff of Office of Strategic Services.

BRYANT MATHER, Assistant Curator, Mineralogy—Civil Service Worker for Corps of Engineers, U.S. Army.

JOHN McGINNIS, Guard—U. S. Merchant Marine.

NIGHT LIGHT FISHING TECHNIQUE IS AN AID TO SCIENCE

BY LOREN P. WOODS
ASSISTANT CURATOR OF FISHES

Man, through the ages, has devised many types of lures to attract his prey to within striking distance. In fishing, this luring method has been developed to an extreme, and there is a great variety of luring gear for the securing of fishes. Fishing by the light of a fire on a rocky promontory or in the bow of a canoe has long been practised

bay, but some of the richest hauls were made when the engines were stopped in the open ocean and the yacht drifted with the currents for a few hours.

RARE BABY SAILFISH

A great deal of pelagic life seems to congregate above the edge of the continental shelf one hundred and twenty-five miles southwest of Cape Malo, Panama. This is near the place where a strong drift



RARE PACIFIC FORM OF SNAKE MACKEREL

This three-foot specimen of the fish scientifically designated as *Gempylus thrysitoides* came to fishing light used by Leon Mandel Galapagos Expedition at night and was caught on a squid-jig. During the day such fish live in the ocean depths, which accounts for the enormous eyes characteristic of dwellers in the "twilight zone." The barracuda-shaped head and enlarged razor-sharp teeth indicate predatory habits. The Pacific form is known from only two or three specimens; an Atlantic species (*Gempylus serpens*) is much more common, and fishermen of Madeira catch it for the food markets.

by many tribes of fishermen all over the world. Modern gasoline lanterns have been used in this country with such fatal results to the fishes that laws have been passed in some places prohibiting their use.

Recently marine fish collecting has been greatly expanded by use of an apparatus called "the under-water light." This consists of an electric light bulb sealed in a heavy glass globe which in turn is protected by a wire basket. The whole apparatus is of a convenient size and may be lowered into the water from a ship's rail to any desired depth. Swarms of plankton, larval shrimps, and fishes of all sizes are drawn to the light as insects are to a street lamp. It is possible to see clearly into the water in all directions for fifteen to twenty-five feet, and the collector standing poised with spear and dip-net has an enormous advantage over the myriad forms of animal life attracted within range, since he can observe and collect without being seen.

The animals that come to the light may be roughly classed into two groups: (a) weakly swimming animals (plankton), such as water striders, luminescent fishes, and a variety of flying fishes, large and small, that come because the light attracts them; (b) sharks, predatory fishes, and squids that are apparently not affected by the light but come only to prey on the concentration of animals.

During the Leon Mandel Galapagos Expedition of Field Museum in 1941 many evenings were spent using this method of fishing, and many rare and valuable animals were collected. Some forms were attracted while the yacht was anchored in a quiet

from the west divides, and the resulting counter-currents mix the water sufficiently to bring food substances up from the bottom, with the result that a great diversity of minute plankton and its predators literally pack the water. During one hour of drifting in this region two baby sailfish (*Istiophorus greyi*), between four and five inches in length, were taken. Sailfish of this size are extremely rare and practically nothing is known of their habits. Tiny dolphins (the fish, not the mammal) six inches long were collected, a whole school at a time. Pelagic crabs (*Euphyllax*), oceanic water striders (*Halobates*), and luminescent fishes of several kinds, could be collected by scores. The luminescent fishes (*Mycetophidae*) commonly called "lantern fishes" because of the rows of luminescent spots along the sides and on the upper surface of the tail, live in the lightless depths in the daytime, but are driven to the surface at night by schools of the wolf-like squids.

The flying fishes were probably the most interesting to watch of all the fishes that came to the underwater light. Some of these were large and swift swimming, one or two feet long. They seemed to be wildly excited by the light. Schools of a dozen or more would rush in, lunging at the light, often stunning themselves by the force with which they struck the light or the side of the ship. It was possible to make observations on their flight from the time they started a dash from ten feet under water until they broke the surface and sailed away out of the circle of light. It was noted that the wing-fins were often spread under water and these were used for banking,

turning, elevating, or braking. The fins were folded close to the body as the fish shot toward the surface, but were opened immediately when it broke water. No fluttering of wings on these larger types could be detected, but once the fish was on a level with the surface of the water it was in such a dim light that close accurate observation could not well be made. Other kinds were the tiny butterfly-flying fishes with short, heavy bodies and colored wings. They would come fluttering through the water into the light, their gaudy appearance and behavior showing how they live up to their common name.

Another rarity attracted to the light was the snake-mackerel (*Gempylus*), a long, shiny-black, eel-like fish from the depths, with greatly enlarged eyes and large, flattened, dagger-like teeth. Whole specimens of this fish have been taken in the Pacific only rarely, and it is known largely from fragments which have been washed up onto the shore.

MARINE SNAKES

Several specimens of a species of marine snake were seen, but only one came near enough to be netted. Marine snakes are related to the cobras and coral snakes. The only species on the American coast is brown above with a bright orange under side. It is seen in fair numbers in Panama Bay at certain seasons, but disappears for long periods of time. Very little is known of its migratory movements. Marine snakes eat small fishes, especially various eels.

Until recently few oceanic expeditions had utilized this method of fishing with a strong electric light in the water at night. It has certainly proved productive wherever used, and very likely many new forms of open ocean fishes and invertebrates will be discovered when it is used more extensively.

Paleontologist Patterson Promoted

Mr. Bryan Patterson, a member of the Museum staff since 1926, and Assistant Curator since 1935, has been appointed Acting Curator of Paleontology. His promotion is to fill the vacancy caused by the recent retirement of Mr. Elmer S. Riggs, Curator of Paleontology for 44 years. Mr. Patterson has conducted a number of fossil hunting expeditions, and has published extensively within the scope of his subject.

Museum Employees Do Their Bit

During 1942, employees of Field Museum have participated in five campaigns for community welfare and for aiding the war efforts: the Community Fund of Chicago, the United Service Organizations drive, the American Red Cross subscription, the campaign for regular purchases of War Bonds by payroll deductions, and the collecting of reading material for the armed forces in the Victory Book Drive.

GIFTS TO THE MUSEUM

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

Department of Anthropology:

From Mrs. Edward Sonnenschein, Glencoe, Ill.—28 Chinese objects, of the Shang and Chou periods; from Joseph Adams, Chicago—6 ethnological objects, Burma, Korea, and Peru; from Mrs. Donald Collier, Chicago—a Navajo jar, Arizona; from Ivan Geduldig, Chicago—a pair of beaded moccasins, plains area, United States.

Department of Botany:

From Lawrence J. King, Coshocton, Ohio—117 specimens of algae, Ohio and Indiana; from Gordon Pearsall, Maywood, Ill.—33 herbarium specimens, Illinois and Indiana; from Dr. Rogers McVaugh, Takoma Park, D.C.—92 herbarium specimens, Delaware; from Loren P. Woods, Chicago—48 specimens algae, Michigan; from Dr. Annetta Carter, Berkeley, Calif.—22 specimens of algae, California; from Henry S. Dybas, Chicago—35 specimens of fleshy fungi, near Chicago; from William A. Daily, Indianapolis, Ind.—60 specimens of algae, Indiana; from Professor Angel Maldonado, Lima, Peru—16 specimens of marine algae, Peru; from Donald Richards, Chicago—142 specimens of bryophytes, Maryland; from Mrs. Netta E. Gray, Panama City, Fla.—37 specimens of algae, Utah and Colorado; from Dr. Ruth Patrick, Philadelphia, Pa.—21 specimens of algae, Pennsylvania and Tennessee.

Department of Geology:

From O. C. Barnes, Los Angeles, Calif.—10 polished fossil specimens, Nevada; from John M. McClum, Chicago—2 specimens of septaria.

Department of Zoology:

From Robert Patton, Chicago—a woodchuck, Illinois; from William Vogt, Washington, D.C.—a spider and 188 specimens of marine mollusks and marine lower invertebrates, Peru; from General Biological Supply House, Chicago—an embalmed and doubly injected steer head; from Chicago Zoological Society, Brookfield, Ill.—a leopard, a coati, a donkey, 61 birds, and 220 bird lice; from Jerry Cordell, Chicago—31 salamanders, frogs, snakes, and turtles, Illinois, Indiana, and Michigan; from Major Lenox R. Lohr, Evanston, Ill.—a marmoset, South America; from Sidney Camras, Chicago—160 beetles, myrmeconids, and bugs, Wyoming; from Dr. Charles H. Seavers, Chicago—61 ants, scorpion-flies, and allies, Tennessee, Colombia, and Mexico; from Lt. Rupert L. Wenzel, Chicago—260 histerid beetles; from Bryan Patterson, Chicago—161 insects and allies, and 30 specimens of isopods and land shells, Illinois; from Henry S. Dybas, Chicago—700 insects and allies, and 20 specimens of land shells, Colombia, Illinois, Indiana, and Wisconsin; from Mrs. Clara K. Walton, Highland Park, Ill.—5 birds, Illinois; from Lincoln Park Zoo, Chicago—an orang.

The Library:

Valuable books from Elmer S. Riggs, Lawrence, Kan.; from Carnegie Corporation,

New York; from Olaf Olsson Nylander, Caribou, Me.; and from William J. Gerhard, Dr. Fritz Haas, Miss Edith M. Vincent, Frank L. Heyser, Mrs. M. J. Hubeny, George I. Quimby, Bernard Benesh, and North Park College, all of Chicago.

28 TONS OF SCRAP FROM MUSEUM TO AID U. S. WAR EFFORT

Field Museum has contributed 28 tons of scrap metal to help America win the war. The last eight-ton pile of scrap, systematically collected from all over the huge



Photograph courtesy of The Chicago Sun

MUSEUM SCRAP METAL GOES TO WAR

Chief Engineer William E. Lake and Assistant Superintendent James R. Shouba inspect collection of discarded material which brings total contribution to 28 tons.

building, was removed October 8 for conversion into weapons to be used against the nation's enemies.

Previous contributions amounted to 20 tons of scrap iron, steel, bronze, copper, zinc, and lead, as well as several hundred pounds of rubber. The Museum administration foresaw the war need of these materials before the present drive began, and undertook to collect and dispose of its scrap months ago.

Last month's eight-ton pile was the result of an intensive survey in co-ordination with the national scrap-collecting campaign, in which every possible item that was overlooked before, and every new item of scrap which had become available, had been collected, according to Mr. William H. Corning, General Superintendent. Included were discarded condensation-receiving tanks, plant-leaf reproducing machines and molds once used in the laboratories of the Department of Botany, steel I-beams remaining from construction projects, old radiator covers, tubular iron frames once used by taxidermists in modeling manikins for mounting animal skins, bronze standards, molds and bearings, worn-out machinery of various types, pipes, and railings. In previous loads the Museum disposed, among other things, of an obsolete collotype printing press which weighed three tons, and had been built in pre-Nazi Germany.

STAFF NOTES

Mrs. Ellen T. Smith, Associate in the Division of Birds, whose assistance in the care of the reference collection has been especially valuable while the Curator and Assistant Curator have been on leave for war service, has been obliged to move to Dayton, Ohio, where her husband, Mr. Hermon Dunlap Smith, is engaged in important war activities.

Miss Loraine Lloyd has been appointed to the staff of Raymond Foundation lecturers. She is a graduate of the University of Wisconsin with a B.A. degree and has been a general science teacher in the South Milwaukee High School. Mrs. Leota G. Thomas has been granted a year's leave of absence, and Miss Elizabeth Hambleton has resigned from the Raymond Foundation.

At the request of the publishers of *The Encyclopedia Britannica*, Mr. John W. Moyer, a Field Museum staff taxidermist, has prepared the article on taxidermy to appear in the next edition. Photographs made in the Museum's taxidermy studios will be used to illustrate various processes employed in the mounting of birds, mammals, and fishes.

Mr. J. Francis Macbride, Associate Curator of the Herbarium, is working on the flora of Peru at the University of California, in Berkeley.

Staff Taxidermist C. J. Albrecht left Chicago October 17 to collect small mammals and reptiles in the Mojave Desert and Death Valley, California.

NEW MEMBERS

The following persons became Members of Field Museum during the period from September 9 to October 15:

Associate Members

V. W. Coath, Dr. Adelaide Johnson, Mrs. Clara L. McCausland, Haven A. Requa, Aubrey L. Sykes.

Sustaining Members

Lloyd Langdon Mills

Annual Members

Eugene A. Barry, Clyde L. Burtis, Thomas C. Dale, Russell Facchine, Dr. A. G. Falls, S. I. Hayakawa, Edward T. Howe, Mrs. John M. Howe, Mrs. Alphonse Huebner, A. E. Hull, Frank Hunton, George Hust, Lester E. Kipp, Mrs. John L. Manta, Mrs. Etta Fay Marrs, John Maxwell, Stanton M. Meyer, William H. Miller, J. H. Millikan, Mrs. Charles A. Palmgren, Miss Hattie Mae Quick, Dr. Esther Rahn, David F. Rosenthal, Robert E. Schick, Carl Schmidt, R. E. Snoeberger, Oliver C. Snyder, Miss Alice Lucy Towne, Dr. Solomon Zaiman.

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NEW HABITAT GROUP SHOWS FISH LIFE OF THE GALAPAGOS

BY LOREN P. WOODS
ASSISTANT CURATOR OF FISHES

The fish life of the Galapagos Archipelago, represented in a new habitat group with undersea scenery, opened in the Hall of Fishes (Hall O) last month, is of great

of Chile and Peru. Normally the Equatorial Counter Current flows from west to east a short distance north of the Galapagos Islands with occasional side currents coming down into the Archipelago proper. This current is warm (86° F.) and relatively barren of

surface waters, which helps to produce and concentrate all the small forms of drifting plant and animal life known collectively as plankton. This plankton is the beginning of a food cycle or food chain, which, in all its complexity, determines the number and



BENEATH THE SEA IN THE GALAPAGOS

A new habitat group in the Hall of Fishes (Hall O) at Field Museum. It shows a normal aggregation of fishes as seen looking out from a deep cove along the vertical lava walls of one of the islands. The point of observation is about 30 feet below the surface. The group results from studies conducted and material collected by the Leon Mandel Galapagos Expedition of 1941.

interest because of the peculiar oceanographic conditions that prevail in this part of the Pacific. In this region two great ocean currents mingle—one the warm, clear, blue Equatorial Counter Current and the other the cold, greenish Humboldt Current formed by upwelling water along the coasts

plant and animal life. The major climatic and biological influences in the Galapagos, both on land and in the sea, are produced by the Humboldt Current, which averages 15° – 20° F. under other equatorial waters.

The coming together of these two currents produces minor rips and "boiling" of the

kinds of fishes in a given place. That the waters of the Galapagos are exceedingly favorable to life is proved by the fact that on looking through a glass-bottomed bucket, the clear waters along shore anywhere in the islands are seen to be literally packed with a variety of fishes. The number of

kinds (about 300) is not so great as along the rocky shores of the American mainland or among the coral reefs of Oceania, but the number of individuals that may be observed and collected is truly amazing.

Though the islands may be considered a "fisherman's Paradise" since there are many game fishes, both large and small, actual experience proves how futile the term "fisherman's Paradise" can be. In 1941, on the Leon Mandel Galapagos Expedition yacht, the sailors, many of whom were accustomed to the good fishing of Florida, found it so easy to catch large numbers of snappers, jacks, and groupers, the latter weighing 20 pounds and more, that they quickly lost interest in the fishing. The bait would be tossed, there would be an immediate tug, a brief struggle, and another large grouper would have to be hauled aboard and removed from the hook before the fisherman could attempt to catch another kind of fish. This soon became highly monotonous. Many Ecuadorian handline fishermen fill their boats with the fishes of these waters, dry them on the beaches of the islands, and carry them back to the mainland to be sold. The American (and formerly the Japanese) tuna fishermen make regular trips here and one crew of 10 to 20 men has caught as much as 90 tons of yellow-finned tuna in a single day on pole and line with the barbless tuna hook baited with only a feather.

The islands lie on the equator and the majority of the fishes belong to groups limited to warm tropical coasts. The Galapagan environment, however, is more nearly like that of the sub-tropics and may readily be compared with that of southern California. The cold Humboldt Current and other conditions along the rough lava shores make these waters unfavorable for the growth of corals. Most of the types of fishes in the Galapagos live normally among coral reefs in other parts of the world, and the adjustments of the tropical coral reef fishes to shores along which coral reefs are absent are most interesting.

LAVA ROCK DENIZENS

One of the chief things that makes a coral reef such a peculiarly suitable habitat for fishes both large and small is the availability of numerous crevices for hiding and resting. The cindery texture of the Galapagos lava and the tumbled, eroded blocks also provide such shelter. The food supply is a second important reef characteristic. Many coral reef fishes literally browse on the coral, biting off pieces, grinding and swallowing the hard as well as the soft parts. Best known among these browsers are the parrot fishes and wrasses or hog-fishes. Many smaller fishes feed on the smaller particles thus loosened.

There are also encrusting bryozoans over the older dead parts of the corals. Whole groups of fishes, including the demoiselles, butterfly and angel fishes, triggerfishes, and

tangs, have brush-like teeth or small movable incisors, that enable them to rasp off the nutritious parts of the encrustation. In brief, coral reef fishes are among the most specialized of fishes in their food habits and they are closely bound to their habitat. Hence, to find them flourishing in regions without corals presents a number of obviously interesting problems.

PREDACEOUS FISHES INCLUDED

There are vast amounts of pasturage on the rock walls of the Galapagos, and though corals are so scarce as to be unimportant for food, the encrusted animal and plant life covers all but the most exposed parts. This food, though widespread, grows in a very thin layer so that feeding requires some time. One of the strangest sights in the waters of the Galapagos is to see several kinds of strikingly colored fishes nuzzling at the rocks, working over their surfaces more or less systematically to gather their necessary food. Finally, there are the predaceous fishes such as groupers and smaller sea basses, snappers, jacks, and pompanos that depend upon the smaller fishes for their food. These predaceous fishes also have a heritage of warm waters but not necessarily of coral reefs. There are no shore fishes that may be said to have arrived at the Galapagos from the cold waters of Cape Horn or the coasts of Chile, as have the Galapagos penguin and the sea lion, both of which are characteristic of the Antarctic. The few types of fishes characteristic of cooler waters, such as scorpion fishes and blennioid fishes, are most certainly derived from the Californian region rather than from the coasts of South America.

The fishes of the Galapagos, and, indeed, of the whole eastern Pacific region from the southern tip of Lower California to northern Peru exhibit closer relationships to those of the West Indies than to the island faunas of the central and western parts of the Pacific. It would seem that the narrow strip of land forming the Isthmus of Panama has not been so permanent a barrier to fish distribution as the 3,000-mile expanse of deep, open water lying between the American outpost islands and the nearest islands of Polynesia. That the Isthmus has been submerged relatively recently (during Late Miocene or Early Pliocene) is proved by the several identical species on both sides of the Isthmus and the very close relationship of an overwhelming number of species whose nearest relatives occur on the opposite side of the Isthmus. Only a few forms from Polynesia have managed to cross to the eastern Pacific and these are found in the Galapagos Archipelago and at Cocos Island; fewer still have reached the American mainland.

SPECIES KNOWN IN NO OTHER AREA

A number of fishes of the Galapagos Islands are known nowhere else in the world, but as more and more detailed studies are carried on both in the islands and along the

shores of Mexico, Central America, and their respective off-shore islands, the number of such supposedly 'endemic' fishes is gradually being reduced. This is the case in spite of the fact that the Galapagos are purely oceanic islands and have never been connected with the mainland. The distribution of these shore forms may be explained by the shifting of currents and by the fact that ecological conditions along the rocky shores of the Galapagos are, except for temperature, but slightly different from the shores of the mainland. Even this temperature varies with the currents so that the Galapagos waters are periodically warmer.

The studies for the new Galapagos group in Hall O were made by the members of the Leon Mandel Galapagos Expedition in 1941 (FIELD MUSEUM NEWS, April, 1941). The fishes have been reproduced by Staff Taxidermist Leon L. Pray from casts made in the field by Staff Taxidermist Leon L. Walters, and Mr. Ronald J. Lambert who served as volunteer assistant. The rock work and accessory materials are by Preparator Frank H. Letl who was assisted in the early phases by members of the Museum's WPA project, and later by Assistant Taxidermist Frank C. Wonder. The background was painted by Staff Artist Arthur G. Rueckert. Many other members of the staff of Field Museum have contributed their special abilities to the design and materials which have gone into making this most difficult type of exhibit.

Museum Botanists Contribute to Soldiers' Manuals

At the request of the National Research Council, Washington, D.C., Field Museum's Department of Botany is preparing manuals of plants of the tropics which are likely to be of special interest or concern to soldiers, sailors, and marines at posts in Latin America. The manuals describe and figure plants which are poisonous or otherwise noxious and should be avoided, as well as those which are valuable as sources of food for enlarging the diet or as emergency rations. The manual on the plants of the Guianas and Brazil, of which a section on poisonous plants has already been printed, is being prepared by Dr. B. E. Dahlgren, Chief Curator of the department. The manual of plants of Central America is in the hands of Mr. Paul C. Standley, Curator of the Herbarium, who is especially well acquainted with the flora of the region which includes all the Central American republics as well as Mexico. Artists have been commissioned to prepare the illustrations under the direction of the botanists.

A representative collection of pottery excavated from various Pueblo ruins in the southwestern United States, and covering about 800 years from A.D. 700 to 1500, is on exhibition in Stanley Field Hall.

WEST AFRICA—MUSEUM HAS RICH COLLECTIONS FROM AREA NOW IN SHADOW OF THE WAR

(Map on page 4)

BY WILFRID D. HAMBLY
CURATOR OF AFRICAN ETHNOLOGY

Africa has recently become the center of the world's chief news interest. While the main war activity has been in Algeria, Morocco, Tunisia, Libya, and Egypt, we have had more than hints that West Africa, as well as North, may soon be the scene of tremendous operations in which American troops, with the armies of our Allies, will no doubt play a vital part. The African



RARE BRONZE HEAD FROM BENIN

This ancient object represents a type of native casting with an alloy of tin and copper. Work of this kind was in progress when Portuguese explorers visited Benin 450 years ago. This example in the Museum's collection probably represents a king or other notable personage.

situation appears to many authoritative observers to mark the turning point of the war, and may prove to be the decisive factor in our ultimate anticipated victory.

Chicagoans have the opportunity to familiarize themselves with African cultures under unusually favorable circumstances, because Field Museum has developed a remarkable and comprehensive ethnological collection exhibited in two halls of the Department of Anthropology (Halls D and E). Further, Africa's animal life, plant life, and geological conditions are well represented in the collections of the Museum's other departments, the zoological collections being especially impressive in their scope.

EARLY WEST AFRICA

During a long period extending back to the year 1500, West Africa has been regarded as a land of disease, jungle mysteries, and early death for explorers and white settlers. Such opinion was, in fact, fully justified until recent times when medical science made a partial conquest of malaria and the still more deadly yellow fever. The latter, known

as Yellow Jack, was particularly dreaded by early traders for whom the rhyme: "The Bight of Benin, whence few come out though many go in," was a quotation made with deep conviction. The natives too, both Negro and Mohammedan, were a real peril to strangers. The former had, and still have in small measure, their secret societies for whose sacred rites human victims were required, and for whose ritual cannibalism was essential. The Mohammedans, as the thrilling diary of Mungo Park (1795) clearly shows, were bigoted, cruel, and violently hostile to strangers.

The establishment of European governments as well as the settlement of traders and missionaries has essentially changed the social background of the native population, and their economic outlook as well. Many schools have been established, railways and roads are well developed, and most recently various air lines have been inaugurated. Dreaded tropical diseases, though at times serious, are yielding to research and preventive measures.

A LAND OF MANY CLIMATES

The great sweep of country from Dakar to the mouth of the River Congo, all around the Gulf of Guinea, has a deep border of dense jungle, and although this is intersected with serviceable roads, a stranger who left the track might soon find himself hopelessly lost or "bushed" as the Africans say. The forest country is a land of moist heat and heavy rainfall, and for this reason is generally regarded as the least healthy area. But as the jungle becomes thinner, perhaps two or three hundred miles from the shore line, the landscape opens out into undulating, sparsely wooded country where cattle-keeping is often a successful occupation. In far west Africa a journey inland, such as that of the Frederick H. Rawson-Field Museum Expedition in Nigeria, conducted by the writer in 1929, led first through dense forest, then over parkland country, and by almost imperceptible stages into the sands of the southern Sahara. Depressing heat and humidity gave way to the cooler mornings and evenings of the open landscape, and finally there was the dry and blazing heat of the desert, but happily with relief at night.

In Angola the coastal region is extremely arid, and a broad strip of hinterland has in some years no measurable rainfall. The interior is mountainous and relatively cool.

A COUNTRY OF VARIED PRODUCTS

Agriculture on an extensive scale is carried on in forest clearings where Negro tribes raise manioc, peanuts, sweet potatoes and yams. These products are a gift from the New World, and perhaps the only humanitarian result of the dreadful slave trade in which European and American merchants indulged from about 1600 to the early nineteenth century. Native agriculture is crude everywhere, though some tribes have

a knowledge of fertilizing with animal manure, and the productivity of the soil is here and there increased by allowing it to lie fallow for a period, or by adopting a rotation of crops. But the plow is not used except as a result of introduction by Europeans, and everywhere women may be seen using a hand-hoe with an iron blade and a wooden handle. Agriculture is primarily a concern of women, although men in many localities clean the ground and burn the brush.

In Field Museum's Hall of Food Plants (Hall 25) is a very artistic mural of large size, by Julius Moessel, showing women of Angola hoeing their fields. The Department of Botany displays many examples of plants and trees that are of primary importance in the Negro life of Africa. In Martin A. and Carrie Ryerson Hall of Plant Life (Hall 29) are natural size models showing the growth of bananas and yams, and the germination of the coconut, and in Hall 28 (Plant Raw Materials and Products) there is a very life-like reproduction of the cotton plant. Imported cotton fabrics are now common in Africa, but home-grown cotton is still woven on primitive looms by both men and women. In Hall 25 are many natural examples of palm trees, of which the raffia and the oil palm are of exceptional interest. West African Negroes of the forest regions strip the fine, tough fiber from the leaves of the raffia, and this they



AN INHABITANT OF TUNISIA

Well educated Arabic-speaking type with Berber features.

weave into mats and baskets, after dyeing with pigments made from indigenous plants. Much of this artistic work is displayed in Hall D, in numerous cases representing the native crafts of Nigeria, the Belgian Congo, and Angola. From early days Europeans have exploited this natural wealth of vegetation and desire for possession has led to international jealousy and conflict. Natural resources are being increased by



WOMAN OF TUNISIA

Bedouin Arab type of region now being contested.

irrigation and scientific study of forestry and agriculture.

ANIMAL LIFE ABUNDANT

Motion pictures have made us all familiar with the great herds of antelope, giraffe, and elephants that roam the open country of East Africa bordering the great central forests, and many of the pictures of lions are from this eastern region. Nevertheless, West Africa has an abundant and varied fauna which is well represented in Field Museum's collections.

The halls of the Museum display many fine examples of animal life, and notable among these are the giant-sable antelope with enormous horns, the bongo, and the very rare okapi.

As far back as 1864 the explorer Paul du Chaillu traveled widely in the region of the Congo estuary where he saw and reported the existence of Pygmies and gorillas. He was naturally piqued when his stories were discredited, and rather bitterly remarked that an explorer who finds nothing new is voted a bore, but if his discoveries are startling, the public and his scientific friends call him a liar. In Halls 15 and 22 are examples of gorillas and chimpanzees with maps showing the distribution of these anthropoid apes in central and west Africa.

Ivory has been called the scourge of Africa owing to the depredations of slave raiders, Arab and European, who forcibly recruited gangs of Negroes to carry tusks to the coast. Game laws now make ivory scarce and valuable, and though a little modern work is done by Negroes the products are in no way comparable to ancient carving. Of antique work in ivory Field Museum has two fine examples (Hall D, Case 19). These are tusks from the city of Benin in Nigeria, where the art attained a zenith under direction of the king who retained craftsmen in the royal compound. The tusks were mounted at the base of

an altar where human sacrifices were made. That the African elephant is untamable is a popular belief, but in recent years the Belgian Government has successfully trained African elephants for forestry work in the northeast Congo region.

A MEDLEY OF TRIBES AND LANGUAGES

The vast region we are briefly surveying is inhabited chiefly by Negroes who are similar in physique and physiognomy, though the tribes vary considerably in such traits as height, weight, skin color, and head form. Typically the Negro is long-headed, but in the Cameroons and some parts of the Congo region heads are rounder—this, possibly, may be a result of intermarriage with Pygmy people who are definitely roundheaded.

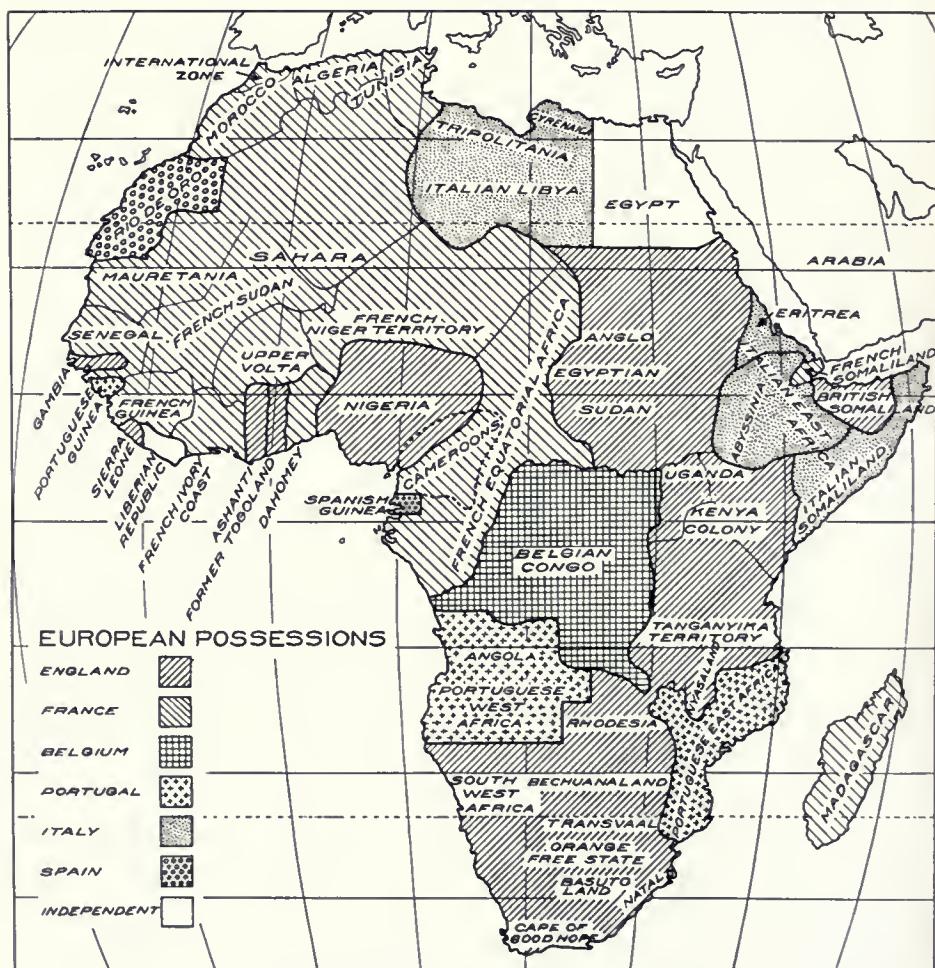
The classification of languages is extremely difficult, but two broad structural divisions, Sudanic and Bantu, must be recognized. The Sudanic languages, spoken by Negroes in the region from Dakar to the Cameroons, differ in structure and vocabulary from the Bantu languages of the Cameroons, the Congo region, and Angola. Moreover, the Sudanic languages are tonal, much more so than the Bantu languages, and the meanings

of one and the same word depend on use of a high, middle, or low tone.

It is not surprising, therefore, that many Europeans prefer to teach English or French to the Africans, or to compromise on "pidgin" English rather than attempt the mastery of a tonal language. The Bantu languages are all similar in structure, that is to say they are grammatically the same, though the vocabularies differ considerably and there are hundreds of dialects not mutually understood. One starts out with Negro servants who, after traveling only fifty miles, may be quite unable to interpret the conversation of Negroes of another tribe. But this difficulty has been largely overcome by the use of widely-spread "trade languages" such as Hausa in West Africa, Umbundu in Angola, and Suahili in the eastern Belgian Congo.

The Tuaregs, who are notable horsemen and camel breeders, are the old type of picturesque caravan men and desert fighters who must view with great astonishment the conquest of the desert by airplane and heavily armed tanks. A Tuareg exhibit will be found in Hall E, Case 12.

The artistic skill and industry of West



THE POLITICAL DIVISIONS OF AFRICA

This map is correct except for Italian possessions which Mussolini has lost.

African Negroes is well attested by a Field Museum collection in Hall D, and in recent years, in both Europe and America, artists have shown marked appreciation of African sculpture in wood. The dense forests of the coast from Sierra Leone, through Liberia, Ashanti and Nigeria to the Cameroons and the Congo, have furnished hard timbers of fine grain which are well adapted for the carving of human figures and masks.

MEDICINE MEN AND MAGIC

Religion and art have gone hand in hand to produce sculptured effigies of notable persons, and the basis of religious belief is the concept of the departed living in a spirit world from which they can exercise control of worldly events for good or evil. Magical practices of the medicine man, who uses wooden masks and other equipment, are the means of bringing the living into contact with the spirit world. In Case 36, which occupies a central position in Hall D, are figures of three Cameroon medicine men in the full regalia of their office, and in Cases 2 and 34 is a valuable collection of ceremonial masks and figures. Carved wooden posts and doorframes, also a remarkably fine drum, all from the Cameroons, are prominent in the display. Most visitors are particularly interested in a human effigy, studded with nails, used by a medicine man. This object, which is shown in Case 1, indicates the process of sympathetic magic whereby injury to the wooden figure is supposed to bring some dire calamity to a person whose name is mentioned while a nail is driven into the wood.

Those interested in music will find material for study in Case 18, where a collection of instruments from Nigeria is installed, and in Case 3 is a fine series of drums and other instruments from Angola.

Some of the best examples of Negro brass-work, silver, pottery, mats and ornamented gourds are shown in Cases 14-16. In Cases 4-9 there is a methodical arrangement representing the arts and handicrafts of Portuguese West Africa (Angola). These collections were made on the Rawson-Field Museum Expedition, and full descriptions are given in several Field Museum publications. The Museum has also published a *Guide Book to the African Collections*.

The cast bronze heads and other objects from Benin (Case 19) are particularly valuable, and many of them are ancient, though exact dates are unknown. Negroes have made few attempts at writing, and our information is derived largely from oral tradition, and from references in early narratives of exploration. The Negroes of Benin were casting in bronze when Portuguese explorers visited Nigeria about A.D. 1500, and the art of making an alloy of tin and copper was not one that they learned from Europeans.

Many beautiful examples of the modern art of casting in bronze are shown in Hall 3.

These works of art by Miss Malvina Hoffman illustrate the racial types of Africa and other areas.

THE EUROPEAN SCRAMBLE FOR AFRICA

The accompanying map of political divisions shows clearly the division of Africa by European nations, until only Egypt, Liberia, and the Union of South Africa can claim independent government. The map is correct except for so-called Italian East Africa which is no longer in Italian hands.

sphere. And a glance at a map indicates that with conquest of Egypt, and with use of the railroad now under construction across the Sahara, powers hostile to America and her allies might have had an enormously extended European dominion. Enemy submarines and other craft based on Dakar, which has well-equipped repair shops, were a great menace to all shipping over a route of 4,500 miles from Casablanca to Cape Town. Dakar possesses a modern airport,



Photograph by Straus West African Expedition of Field Museum

VEILED WARRIORS OF THE SAHARA DESERT

These men are Tuaregs who for many years have been implacable fighters against Arabs and Europeans. The Tuaregs are not Negroes, but they have intermarried quite freely with Negro slaves. Pure Tuaregs of high caste are classified among the northern Hamites. The basis of their custom of veiling the men is unknown. The Tuareg women are veiled because of the requirements of the Mohammedan religion.

From an early date European powers realized the economic value of possessions in Africa. Reference has been made to the variety of useful vegetable products, and there is vast mineral wealth—copper, gold, diamonds, manganese and tin—much of it as yet unexploited. The Belgian Congo produces 60 per cent of the world's cobalt supply, and 90 per cent of the world's uranium from which radium is made. The Belgian Congo produces 100,000 tons of palm oil a year, and all this wealth is typical of the resources of political divisions from Senegal to Angola, which mark the northern and southern limits of our West African survey.

WEST AFRICA AND THE WAR

The French possession of Dakar in Senegal has received so much attention in newspapers and magazines that most readers are familiar with its vital strategic importance to the United Nations.

A distance of 1,800 miles by air from Dakar to the nearest point of the Brazilian coast leaves little ground for a complacent feeling of isolation in the Western Hemis-

a seaplane base, and a harbor capable of accomodating a large naval fleet.

The Belgian Congo is another region of vital importance in the present conflict, and the Belgian Government is to be admired for a whole-hearted resistance after Belgium herself capitulated. More than that, the Belgian Congo forces, after incredible hardship during a long journey, defeated Italian forces in Ethiopia and linked up there with British columns. It is no secret that American forces are now in West Africa, and that the safest supply routes to Egypt and elsewhere follow a long trek across the Belgian Congo.

In a previous number of FIELD MUSEUM NEWS mention was made of American interests in Africa. These go back as far as 1830 when America made successful resistance to the Barbary pirates. America was deeply concerned also in the founding of the Liberian Republic. In the year 1884, about ten years after the noted explorations of H. M. Stanley, American foreign policy supported the founding of the Congo Free State against much European opposition, and today that state is reciprocating by a

welcome to Americans, and by the opening up of necessary supply lines across the continent.

WHAT OF THE FUTURE?

There exists a vast literature dealing with the political, social, and economic problems of this great continent, with an area of 12,000,000 square miles (four times the size of the United States of America) and a native population roughly estimated at 150,000,000 very irregularly distributed. The white population is comparatively negligible in numbers, but Europeans hold the reins of government, though not always well and wisely.

Naturally the problems of administration differ locally, but basically they all are concerned with political adjustment between Africans and whites, with problems of native health, labor, and education. We can be certain that the rapid opening up of Africa during this war will be a development, not merely of railways, airports, and their supply routes, but also one which is social and psychological. There will be a thorough rousing of African thought and political ambition. African aspirations toward self-government will be stimulated, and ideas of freedom and equality will be widespread. Intelligent anticipation of political difficulties is necessary if future unrest is to be avoided.

INDIAN AND CHRISTIAN RITUAL BLEND IN PUEBLO YULETIDE

By DONALD COLLIER

ASSISTANT CURATOR OF SOUTH AMERICAN
ARCHAEOLOGY AND ETHNOLOGY

Ever since the arrival of the Spaniards in New Mexico in 1540, the Pueblo Indians have been in contact with the Franciscan Fathers. Each Pueblo village has its church and its patron saint, and many of the important Indian ceremonies which have come down from prehistoric times are performed on Catholic saints' days.

At Taos Pueblo, seventy-five miles north of Santa Fe, the blending of Indian and Christian ritual may be seen clearly during the Christmas season which, among the Indians as among the early Germanic peoples, was celebrated as the time of the winter solstice. On Christmas eve, following vespers in the pueblo church, is held the "Procession of Our Blessed Mother and the Saints." The Virgin is carried from the church by four men, and the other images are carried behind. Fires of criss-cross sticks are lit, four in the churchyard and others along the route of the procession. In front of the Virgin go two men each carrying a huge torch, ten feet high, of splits of pitch pine aflame at the top. At one side of the torches a choir of townspeople move in dance steps, singing Indian songs to their drum. Child dancers dance backward and forward in front of the Virgin. Alongside the whole procession straggle young men shooting off guns and Roman candles.

On Christmas day is held the Deer Dance. This is an ancient ceremony in which dancers impersonate deer, antelope and other game. Its purpose is to insure the increase of game. Formerly the Taos Indians depended to an important extent on hunting, and are known even today as great hunters.

GIFTS COLLECTED

On Christmas morning the Black Eyes, members of one of the religious fraternities, go from house to house collecting gifts of food and urging the Deer Dancers to get ready. In the afternoon the dancers assemble in two single files outside the wall surrounding the village. The dancers are dressed as deer, antelope, buffaloes, a little coyote, wildcats, and mountain lions. All are garbed in kilts and moccasins; their bodies are nude and unpainted. Each dancer wears the head (including horns, in the case of deer, antelope, and buffalo) and skin of the animal he represents. The head of the animal is over the dancer's head, and the pelt hangs down his back. In each hand the dancer carries a short stick to lean on, the better to imitate the animal's posture.

FEAST ON RAW VENISON

The dancers move into the plaza, where there is a group of singers with a drum, and begin their performance. Each file dances independently, forming intricate figures such as spirals, circles, and diagonals, and each dancer imitates the movements of the animal he represents. While the "animals" are dancing, the Black Eyes, who act as clowns, perform a hunting burlesque. They shoot the deer with toy bows and arrows and drag them from the dance. At the conclusion of the dance, raw venison is distributed among the dancers.

At Santa Ana Pueblo, to the south of Taos, the Christmas ceremonies and festivities, described by Dr. Leslie White, are an interesting blend of Christian and Indian elements. On Christmas eve the Fiscale Mayor (head lay official) opens the church. "The [Indian] sacristan brings out a small image of Jesus, about eight inches long, and displays it on the platform in front of the church altar. Shortly before midnight [the] Fiscale goes through the pueblo announcing that the hour of Christ's birth is almost at hand. The people—men, women and children . . . bring little unbaked clay images of domestic and game animals and images of corn and melons, etc., to the church and place them in front of the altar. They put cotton on the backs of the animal images 'to keep them warm,' and place bread and lighted candles in front of them . . . The purpose of the ritual is . . . to secure the ianyi (power and blessing) of Jesus to multiply the game and to increase the herds and crops.

"At midnight the Fiscales [Indian church officials] go around again, summoning the people to church. When they have gathered, the sacristan and his assistant conduct

prayer service [in Spanish]; the Roman Catholic priest does not come to Santa Ana on Christmas. During the service the people, 'the boys especially,' blow cane whistles, imitating the sounds of birds; this is 'because the birds rejoiced at the birth of Jesus.'"

After the service there is dancing in the church. First the boys and girls give a dance. And then the adults hold a Buffalo Dance in the church. The dancers are dressed as buffalo, deer and antelope in a fashion similar to the animal dancers at Taos, and the dance has a ritual significance parallel to that of the Taos Deer Dance. The dancers go through the pueblo singing before they enter the church and also after they have concluded their dance. Here is a fragment of the Buffalo Song:

"Somewhere the deer are going along and I am walking along behind them with the strength of the deer which I have taken away from them."

SANTA CLAUS, TOO!

Following the Buffalo Dance in the church, Dr. White witnessed an additional festivity. "After the dancers had left the church, a man wearing a red costume and a red beard of the conventional American Santa Claus ran into the church and up to an undecorated Christmas tree which was on the left side . . . of the church near the altar rail. There he found the [pueblo] governor whom he addressed in a loud voice in English. He spoke briefly about how he had come to visit Santa Ana, that he had brought candy to the children for being good, etc. Then shaking hands with the governor and wishing him a merry Christmas, Santa Claus ran out of the church. Then the governor, assisted by his lieutenant, distributed candy, which they took from under the tree, to the children, a paper bag full to each one as they passed by in a line."

The energy of motion lost every year by meteorites colliding with the earth would, if it could be put to use, add many million horsepower hours to the power resources of the world.

MISTLETOE AND HOLLY

The origin of the popular and delightful customs surrounding these Yuletide shrubs is traced in an illustrated leaflet published by Field Museum. The booklet makes a most appropriate Christmas gift. In addition to folklore, it presents in interesting form the principal botanical facts about the plants.

Mistletoe and Holly, by Sophia Prior (32 pages, 8 illustrations)—on sale at THE BOOK SHOP of FIELD MUSEUM. Price 25 cents. Copies may be ordered by mail.

FIELD MUSEUM AIDS ARMY AIR FORCES IN A PROJECT TO PROMOTE FLIERS' SAFETY

BY ORR GOODSON
ACTING DIRECTOR

With the permission of the War Department, Field Museum now is able to reveal a unique activity in which it has been engaged for some months past—an activity that contributes to the safety of members of the U. S. Army Air Forces.

The Museum is now a producer of an important war accessory. This is the result of the combined application of the scientifically accurate measuring methods (anthropometry) used by physical anthropologists to gauge distinctive characteristics of groups of men and women; the researches of medical officers attached to the Army Air Forces; the art of the sculptor in depicting human types; and the driving force of experts in military efficiency and in manufacturing methods to obtain production and action with speed and precision.

For flying at high altitudes, the pilots, bombardiers, gunners, radio operators and other men of the skies, require oxygen masks, and these must be accurately fitted to each man's head. In an anthropometric survey of 2,000 fliers, conducted by officers of the Army's Aero-Medical Research Laboratory at Wright Field, Dayton, Ohio, it was found that the shapes and sizes of aviators' heads could be reduced to seven basic composite types from among which the fliers could be properly fitted with masks. One of these head types—labeled as No. 1, "the mean" (in the sense of average) type—corresponds to the fitting requirements of the majority of the fliers; the other six head types represent the extremes of contours and out-sizes in all directions.

The head models guide the manufacturers of masks and headgear in their production of the variations required, and the quantities of each size needed, as well as assisting them in the designing of new and improved products. An important improvement, for example, is the production by the General

Plastics Corporation, with which Field Museum is co-operating, of oxygen masks from plastic materials, eliminating the necessity for precious and difficult-to-obtain rubber, formerly used, and leaving such rubber available for other essential purposes.

The U. S. Navy and the Royal Canadian Air Force are reported to be adopting the use of the same heads, and will receive their supplies from the Army.

Sculpturing of the original master set of head models, based on the measurements furnished by aero-medical officers, was done by Mr. G. W. Borkland, of Chicago, President of the General Plastics Corporation. After the master set had been approved by Army authorities, the problem arose of producing sets of these models in quantity, as the heads, to meet the medical and air-safety standards, have to be micrometer-accurate.

Because of the scientific nature of this project, Mr. Borkland and the Army authorities, being familiar with the work of the Department of Anthropology at Field Museum, decided to enlist the services of the Museum laboratories and technicians. Production of accurate molds, and from them of accurate plaster casts of the sets of aviators' head types in accordance with the specifications of the Aero-medical officers, is consequently now well under way at the Museum.

Chicago's center of natural history information has thus been brought into war production, in the status of "sub-contractor" to the mask manufacturer. It should be emphasized that Field Museum is making this contribution to the war effort without profit—the sets of model heads are being furnished to the government at actual cost of production.

The work of making the molds and casts has been placed in the hands of Messrs. John Pletinckx and Joe B. Krstolich, sculptors on the Museum staff. Twenty-eight sets, or 196 individual heads, have

already been ordered, of which part have been completed, and others are in process. Further production on a larger scale is anticipated to meet the needs of the Army Air Forces.

MRS. RAYMOND GIVES \$6,000 FOR WORK WITH SCHOOLS

Mrs. James Nelson Raymond, well-known Chicago philanthropist, has again contributed \$6,000 to Field Museum, it is announced by Acting Director Orr Goodson.

"Despite the war, Mrs. Raymond believes that opportunities should not cease for Chicago's children to obtain full advantage from the city's cultural and educational institutions, in order to supplement their school studies," said Mr. Goodson.

As a memorial to her husband, the late James Nelson Raymond, Mrs. Raymond in 1925 established in the Museum, with a liberal endowment, the James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures. Ever since that time, she has made generous annual contributions.

The Raymond Foundation provides lessons and entertainment in the natural history field for approximately 250,000 school children each year, according to Miss Miriam Wood, chief lecturer on the Foundation's staff, and supervisor of its activities. It accomplishes its purpose in various ways—by sending extension lecturers with lantern slides into school classrooms and assemblies by arrangement with the Board of Education; by providing conducted lecture tours of the exhibition halls for groups of children brought to the Museum by teachers and others; by presenting series of free motion picture programs in the James Simpson Theatre of the Museum each spring, summer, and autumn; by the publication of natural history leaflets for children; and by special courses to train teachers and recreation leaders in the natural sciences.



THE "SEVEN BASIC TYPES" OF AMERICAN ARMY AVIATORS

Heads cast at Field Museum in accordance with a master set sculptured by G. W. Borkland. They represent composites resulting from anthropometric studies of 2,000 aviators' heads by officers at the Aero-Medical Research Laboratory at Wright Field, Dayton, Ohio. Almost any flier will classify as one of these types, and can be properly fitted with an oxygen mask which follows the contours of the type in which he falls. By far the great majority—nearly 80 per cent—classify as Type I in the center of picture.

Field Museum of Natural History

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FIELD MUSEUM NEWS

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

FIELD MUSEUM wishes its members, its friends, and its own staff, especially those in the Nation's service:

A CHRISTMAS OF RENEWED HOPE, AND A VICTORIOUS NEW YEAR FOR THE NATION.

NEW HORIZONS

Since the entry of the United States into the war, Museum expeditions have ceased, doubtless for the duration. In 1941, however, several expeditions were in the field in tropical America. These were caught by the paralysis of normal means of transportation and, although the men engaged were able to return by air, the large collections had to be stored with friendly local institutions. Recently, as mentioned in another column, a carload of material collected by two of these expeditions in Central America has been shipped direct to Chicago by rail. Before the war this shipment would have come by water, doubtless safely, but there would have been no choice. Now, however, there is through rail connection, completion of which has been hastened by the war, from Guatemala to Mexico and thence to the United States. This offers a minor but significant example of the many physical changes now under way which will

provide increased facility and opportunity for the work of museum explorers.

Museum expeditions can and do travel through some of the wildest and most undeveloped parts of the world without the aid of prepared routes, but there are many spots and even considerable areas which have been passed by because the time and expense necessary to reach them were prohibitive. Some of them have been so far from any so-called rapid transit that even to get to their borders was a large undertaking. Others offered especial difficulties because of suspicious or unfriendly native tribes. The wide-flung war now going on is opening up many of these areas and, when peace comes, the naturalist-explorer will see his field of action greatly enlarged. What was formerly impractical will become relatively simple.

A new Burma Road, if there is one, will pass through territory heretofore only scratched by explorers, and central Asia in general will become more accessible. New routes in north and central Africa will facilitate travel in that region, and here at home will be the Alaska Highway which may not provide startling discoveries but which will offer opportunities for intensive studies and doubtless will be quickly utilized by naturalists. In other non-combatant areas, as tropical America, the pace of such projects as the Pan American Highway will be quickened and the scattered results of past expeditions then can be tied together and synthesized.

Even in forbidding New Guinea the going will be easier. Until recently this was perhaps the least known area of its size in the world. Its interior mountains and valleys were inhabited by numerous peculiar tribes that had never seen white men and whose contacts with the coast were so limited they scarcely knew of the existence of an outside world. Strange animals and plants, unknown to us, were commonplace to them. Early expeditions to the region had only limited success and those who participated in them suffered great hardships. No one realizes better than they the difficulties confronting our forces now fighting there. During the past fifteen years, however, considerable areas in New Guinea have been explored both by ethnologists and zoologists. This has been done at large expense and by the liberal use of the airplane. Further development of aviation which war is compressing into a short period will make such exploration far more feasible than formerly.

Not only museum explorers, but students, teachers, and preparators may expect a changed outlook after the war. Less spectacular than new highways or safer and cheaper airplanes are the advances that are being made in general technology. We are told and, with the experience of the last war before us, we must believe that industrial chemistry and physics are in a few months accomplishing results that other-

wise might have taken decades or centuries. Museums already have found in modern plastics the solution of many of their problems in the preparation of teaching exhibits. That they will profit by things to come there can be no doubt. Much as we deplore the war and however plainly we see it as a destroyer, we cannot be blind to the fact that it is also a builder.—W.H.O.

Gift Augments Webb Shell Collection

The purchase of the Webb Collection in 1941 established in Field Museum a fine nucleus for a world-wide collection of fresh water shells, and especially of land shells which have always attracted both scientists and amateur collectors. Mr. Walter F. Webb has subsequently made notable additions to the collection. His most recent gift of forty-four lots of land shells from the Philippine Islands includes great rarities, not previously represented in the collection, and other specimens carefully selected with the interests of the Museum collection in mind. It is gratifying that he should retain so cordial and so active an interest.—K.P.S.

FIELD MUSEUM HONOR ROLL

Now in the Nation's Service

Army

THEODORE ROOSEVELT,
Trustee—Brig. Gen.
CLIFFORD C. GREGG,
Director—Lt.-Col.,
A.G.D.

DR. JOHN RINALDO,
Associate, Southwestern Archaeol.—Staff Sgt.

DR. SHARAT K. ROY, Curator, Geol.—Capt.
EMMET R. BLAKE, Asst. Curator, Birds—Corp.
RUFER L. WENZEL, Asst. Curator, Insects—1st Lt.

WILLIAM BEECHER, Temp. Asst., Zool.—Pvt.
HENRY HORBACK, Asst., Geol.—Pvt.

JAMES C. MCINTYRE, Guard—2nd Lt.



Navy

LESTER ARMOUR, Trustee—Lt. Commdr.
JOSEPH NASH FIELD, Trustee—Lt. (S.G.)
COLIN CAMPBELL SANBORN, Curator, Mammals—Lt. (S.G.)

DR. ALEXANDER SPOEHR, Asst. Curator, N. Amer. Ethnol. and Archaeol.—Ensign

JOHN W. MOYER, Taxidermist—Ch. Specialist (Bur. Aeronautics)

PATRICK T. MCENERY, Guard—Master-at-Arms
JOHN SYCKOWSKI, Guard—Ch. Commissary Stewd.

GEORGE JAHRAND, Guard—Ch. Water Tender
CLYDE JAMES NASH, Guard—Ch. Gunner's Mate
NICHOLAS REPAR, Printer—Seaman 1C.

Marine Corps

MELVIN A. TRAYLOR, JR., Associate, Birds—2nd Lt.
FRANK BORYCA, Asst. Preparator, Bot.—Pvt.

Coast Guard

M. C. DARNALL, JR., Guard—Seaman 2C.

Other Services

BERT E. GROVE, Guide-Lecturer—American Field Service (N. Africa)

RUDYERD BOULTON, Curator, Birds—Staff of Office of Strategic Services

BRYANT MATHER, Asst. Curator, Mineralogy—Civilian Worker, Corps of Engineers, U.S. Army

JOHN McGINNIS, Guard—U.S. Merchant Marine

BOTANIST RETURNS WITH PLANTS AND FOSSILS FROM GUATEMALA

After nearly a year of field work in Guatemala, Dr. Julian A. Steyermark, Assistant Curator of the Herbarium, returned to the Museum November 16. He traveled in many of the most remote parts of Guatemala and brought back thirty boxes containing 30,000 specimens of plants and wood specimens for study in connection with the *Flora of Guatemala* upon which he is collaborating with Curator Paul C. Standley. Dr. Steyermark was assisted on the expedition by Mr. Albert Vatter, Jr., of Glenview, Illinois, who acted as plant photographer and zoological collector. Many specimens of birds and mammal skins, as well as preserved material of reptiles, amphibians, fishes, and insects, were brought back by the expedition.

Dr. Steyermark was probably the last person to bring cargo across the Rio Suchiate (the international boundary between Mexico and Guatemala) in what has been the usual manner. This necessitated transferring all the boxed material by ox-drawn carts from the Guatemalan railroad station to the river, across which it was hauled in small boats, and then again transferred to the railroad station in Suchiate, Mexico, by other ox-drawn carts. About a week later the new international railroad bridge over the Suchiate river was officially opened to facilitate transportation between the United States, Mexico, and Central America, and it thus has become an aid to science as well as to commerce.

Dr. Steyermark traveled on the same train in which the specimens were shipped, throughout the length of Mexico, in order to see to the safe transport of the boxes to the United States border.

The shipment also included eighteen boxes of paleontological specimens, consisting in part of skeletons of rare Pliocene and Pleistocene mammals, many of them now known for the first time from Central America. These had been collected in Honduras during the latter part of 1941 and early 1942 by an expedition led by Dr. Paul O. McGrew, Assistant Curator of Paleontology. The specimens had been stored in Guatemala City since that time, because it had been thought then that it would not be practicable to obtain transit facilities for them until after the war.

A more complete account of Dr. Steyermark's expedition will appear in a later issue of FIELD MUSEUM NEWS.

Sea Shells Used at Hospital in Occupational Therapy

All museums accumulate specimens of little or no value. Sea shells without clue to their origin are especially likely to gravitate to museum collections. Such specimens are of no use to the geographic and variation studies made in museums, and are often discarded. Fortunately, how-

ever, Dr. Merrill Moore, of the Fitzsimons General Hospital in Denver (now a Major in the Army Medical Corps), has recently found use for such shells as objects of interest that can be studied and classified, thus forming a kind of occupational therapy for bedridden and convalescing patients. Major Moore has found this method so effective in speeding recoveries by improving the patients' mental outlook that he has published an article on the subject in the *American Journal of Psychiatry*.

Field Museum has recently contributed a considerable collection of this sort for such use in the Denver Hospital. —K.P.S.

A COLOR PICTURE BOOK OF MUSEUM EXHIBITS

A little booklet entitled *Exploring Field Museum*, just published, contains color pictures of some of the most attractive exhibits. Included are more than 40 reproductions of outstanding selections from the albums of Mr. Clarence B. Mitchell. On the staff as a Research Associate in Photography, Mr. Mitchell maintained a studio in the Museum and contributed his time and effort for many months to making the pictures. He also made a generous contribution of funds for purchase of the four-color printing plates, thus making it possible to distribute the book at far less than the actual cost of production.

Exhibits from all departments of the Museum—Anthropology, Botany, Geology and Zoology—are included in the pictures. Opposite each one is brief descriptive text prepared by members of the scientific staff. Among the subjects reproduced are: the famous Theodore-Kermit Roosevelt habitat group of giant pandas (containing the first specimens of this popular animal ever to reach America); a restoration of a Coal Age forest of 250,000,000 years ago; several of the cave man dioramas from the Hall of the Stone Age; elaborate Egyptian mummy cases; a habitat group of emperor penguins for which the specimens were collected in Little America by an expedition led by Admiral Byrd; several of noted Chicago artist Julius Moessel's murals depicting the production, gathering, and distribution of food plants all over the world; the habitat group of an African water hole and its animal visitors, one of the largest and most elaborate natural history groups in any museum; and especially colorful specimens of primitive pottery, animals, birds, flowers, fruits, and minerals.

The book is on sale at the Museum Book Shop (60 cents).

Fresco paintings of the first century A.D., from Boscoreale, a village north of Pompeii, form a noteworthy item among the exhibits in Edward E. and Emma B. Ayer Hall (Hall 2) devoted to the archaeology of Etruria and Rome.

THINGS YOU MAY HAVE MISSED

A Maize-Cloaked God of Ancient Peru

Among the prehistoric farming Indians of the New World, maize was the staple crop, and it was from Indian maize that our modern varieties of corn were derived. Since maize was such an important Indian



EARS OF CORN DECORATE ANCIENT GOD

food, it is not surprising that the plant played an important part in the religion and ceremonies of the agricultural Indians.

In Case 12, Hall 25 (the Hall of Food Plants) may be seen many varieties of Indian corn, as well as an ancient Peruvian representation of the god of fertility, clothed in a cloak of maize. Other examples of the Peruvian maize god, more than 1,000 years old, are shown in Case 21, Hall 9 (Archaeology and Ethnology of South America). Stone statues of the Aztec maize goddess are shown in Cases 2 and 5 of Hall 8 (Mexico and Central America). In Hall 7 (Archaeology and Ethnology of southwestern United States), Cases 5, 6, 23, and 28 are life-size models of Hopi altars showing the use of corn ears and sacred corn meal in various religious ceremonies. —D.C.

Exhibit Demonstrates the Difference Between Crocodiles and Alligators

One of the most familiar questions asked of naturalists concerns the difference between crocodiles and alligators. The difference in question, largely in the broader snout and overhanging teeth of the alligator, is well shown by a skeleton in Hall 19, where, with the addition of a gavial, these three living types of the crocodile group may be comparatively studied.

N. W. HARRIS SCHOOL EXTENSION ENLARGES ITS SERVICE

BY JOHN R. MILLAR

CURATOR, N. W. HARRIS PUBLIC SCHOOL EXTENSION

In the October issue of FIELD MUSEUM NEWS, Mr. Stanley Field, President, stated as one of the Museum's chief wartime aims that "...earnest efforts must be made to avoid any cessation of the institution's educational projects (both juvenile and adult), particularly those for the benefit of school children...."

One of the effects of wartime restrictions on the use of automobiles and chartered

the kind and order of arrival of exhibits. Nevertheless, the fact that the system keeps the bulk of available cases in circulation throughout the year, and provides the greatest number of schools with seasonal material at times when it will be of greatest utility to the teacher, seems to be the best compromise with a difficult problem.

To compensate for the lack of flexibility in the circulation of the more formal exhibits, other types of material have been developed to provide teachers with visual



MATERIAL FROM "SPECIMEN LIBRARY" FOR PUBLIC SCHOOLS

The now familiar type of portable exhibit of the Museum's N. W. Harris Public School Extension is shown here with other kinds of illustrative material that may be borrowed by Chicago teachers.

busses is to increase the difficulties of bringing groups of school children to the Museum. Under the circumstances prevailing, the work of lending portable museum exhibits to schools and other educational organizations of Chicago assumes considerable added importance.

The preparation and circulation of natural history exhibits in the schools is a function of the N. W. Harris Public School Extension of Field Museum. This fall, more schools are receiving the benefits of this Museum service than ever before in the history of the Department's thirty years of existence. Nearly 1,000 cases are now in regular circulation among 497 schools and other educational or social service organizations of the city. During the course of the school year, each borrower will have the use of thirty-four portable cases containing birds, small mammals, plants, and other objects useful as visual aids to instruction in subjects covered by courses of study in the elementary and high schools.

The present system of distribution of cases in the schools may be considered somewhat arbitrary because it involves simple rotation of exhibits from school to school, and the individual school is unable to choose

aids in the form of museum materials at times when instruction in a particular subject is being given.

These materials include birds and small mammals in transparent tubes; pressed plants of the Chicago area prepared in transparent, protective coverings for handling, and accompanied by accurate identifications; insects in small handcases, as well as in individual mounts; specimens of rocks and minerals; seeds, soils, and sundry economic products in small jars and bottles; and a limited amount of ethnological material, chiefly American.

Teachers may now come to the Museum to borrow specimens from the Harris Extension in much the same way that they would borrow books from a public library. Or by writing or telephoning the Department, they may have the collections delivered to their schools at the next regular visit of the Museum's delivery truck. Individual attention is given to each request in an attempt to assemble specimens that will aid in the accomplishment of the teaching aims of the instructor. Besides timeliness, a merit of the new type of material is the fact that it can be handled by pupils, a procedure that is generally recognized as helpful

to both the teacher and the child during the learning process.

The entire project is one to supplement, rather than supplant, the ability of the individual school or teacher to acquire, and keep on hand at all times, illustrative material for teaching the natural sciences, or to provide extra-curricular interests for pupils. However, with the restrictions imposed by government on certain kinds of collecting, and popular sentiment in favor of conservation, it is apparent that the Museum performs an important function in collecting, preparing, and lending to schools many of the things that are useful for instructional purposes and increasingly difficult to obtain and preserve.

Staff Notes

Miss Virginia Drew and Miss Jeanne Bailey have been appointed as guide-lecturers on the staff of the James Nelson and Anna Louise Raymond Foundation. Both have prepared for this work at the University of Chicago.

Staff Taxidermist John W. Moyer has enlisted in the United States Navy as a Chief Specialist in cinematography for the Bureau of Aeronautics.

Dr. Paul S. Martin, Chief Curator of Anthropology, gave a lecture before the Woman's Alliance Unitarian Church on "Race, Language and Culture," November 10, and on November 12 addressed a seminar at the University of Chicago on archaeological work in New Mexico.

Dr. C. Martin Wilbur, Curator of Chinese Archaeology and Ethnology, gave a lecture on November 16 to students in Chinese history at the University of Chicago on "Economic Conditions in China During the Former Han Dynasty."

Dr. Wilfrid D. Hambly, Curator of African Ethnology, recently attended a meeting in Washington, D.C., of the African Committee of the Ethnographic Board, held under the auspices of the National Research Council.

Pvt. Emmet R. Blake, Assistant Curator of Birds, in service with the U. S. Army since June, has been promoted to Corporal, and assigned to specialized duties.

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.

SACRED TREES AND CHRISTMAS

By WILFRID D. HAMBLY
CURATOR OF AFRICAN ETHNOLOGY

The origin of the Christmas tree, which is said to have been introduced somewhat late into Christian England, is the subject of a vast amount of folklore, a great deal of it more imaginative than factual. The decorations are sometimes said to be symbolical of the magical flowering, quite out of season, of the mythical Glastonbury Thorn. An Icelandic legend relates to the fall of an ash tree on Christmas Eve, and observers record that the fallen tree became covered with beautiful lights that were not extinguished by the strong gale that was blowing.

No wonder that trees played so prominent a part in the religion and folklore of mediaeval Europe, for it was said that a squirrel could travel hundreds of miles by jumping from tree to tree. The amount of literature relating to the folklore and the symbolism of trees is astonishing, and one cannot doubt that the beliefs relating to Christmas trees, mistletoe, holly, the yule log, and oak trees are part of a world-wide series of beliefs as ancient as man himself.

CHRISTMAS TREE A PHASE OF "ANIMISM"

"Animism" is a word used by anthropologists to describe the attribution of a soul, spirit, and human or divine qualities to trees, animals, and even to inanimate objects. The animistic beliefs relating to trees seem to be generalized in the first place; then, by a selective process, certain species (and among the species individual trees) are made the focus of magical beliefs, ceremonies, and sometimes even of a definite cult or religion.

In Britain the oak and the mistletoe were symbolic of Druidism. The yew was perhaps not so important, but on account of its longevity and the toughness of its timber the tree became a symbol of immortality. Perhaps this explains the fact that so many old yew trees are found in graveyards of England today. For restoring health to a sick child, a sapling ash tree was used in an ancient European ceremony. The growing tree was split, and at sunrise the child was passed back and forth through the cloven trunk, three times, or in multiples of three. The symbolism is that of strength and elasticity from the young timber, and life and power from the rising sun. The magical meaning of numbers and multiples of numbers has a long history and folklore, and many examples are mentioned in the Old Testament.

Tree worship and symbolism have been by no means confined to primitive communities of uneducated people. Greeks and Romans had their sacred groves. The oak was sacred to Zeus, and the laurel to Apollo. Victors in the Olympic games were crowned with a helmet decorated with twigs of the olive tree.

The planting of trees to commemorate an event of historic importance keeps alive

the ancient symbolism of trees. One writer gives instances of the European custom of planting trees to celebrate a birth, an apple tree for a boy, and a pear tree for a girl. As the tree flourished or declined so did the vitality of the child who was represented.

The reverential attitude toward trees is sometimes due to a belief that a human spirit dwells within the tree, and that revenge will be taken for an injury. So one reads of spells and prayers offered to trees, and profuse apologies before cutting. Even the timber of the felled tree when built into a house retains the sacred character of the tree itself, and the planks may have to be sprinkled with the blood of an animal sacrificed to the tree spirit. Feelings of awe are nevertheless sometimes tempered with great practicality, and the angry woodsman exclaims as he strikes a blow "Will you bear fruit? or shall I fell you?"

Biblical stories of the tree of life and of knowledge are in keeping with beliefs and practices of the Near East at the present day. Many communities which depend on dates as staple food recognize the fact that male and female flowers are produced on different trees, and the pollen is ceremonially transferred from the male flower to the female. In one region this is the time for celebrating a marriage festival for the gods and goddesses.

WHAT IS A GIFT?

So numerous are the instances of sacrifice to a tree that one might hazard a guess that laying presents at the foot of the Christmas tree is a survival of former rites of worship. So Yuletide becomes the season of gifts. The prospective purchaser is warned that there are only ten—nine—eight—days and so on in arithmetical progression, during which his sacrificial offerings may be obtained. The furtive laying of gifts before the sacred tree suggests secrecy of worship, and the nocturnal prowlings of children who steal downstairs to examine the shapes of the packages is nothing less than a violation of the sacred grove.

One does not usually turn to the lexicographer and his dictionary for gratification of a sense of humor. But the definition of a gift as "An act of spontaneous bounty without any thought of a return" is not devoid of levity, probably unconscious. Perhaps the learned lexicographer never saw a Christmas crowd fighting for bargains, nor witnessed the eager return of presents to the store in exchange for something the recipient regards as more suitable.

ANOTHER KIND OF "INDIAN GIVING"

Many societies are notorious for their expectation of a return which shall be greatly in excess of the present given. In the potlatch ceremonies of the Northwest coast of British Columbia it was an understood rule that every recipient was bound to return a present twice the value of the offering he had accepted. Chiefs would beggar themselves in giving away and

destroying property, partly as a sign of their opulence, but no less to afford evidence that their souls were not worldly and mercenary.

Anthropological literature is replete with examples of gifts offered to chiefs or other men of note, not with the expectation of a present in return, but with the idea that the chief will reciprocate by doing something or by abstaining from some action. This, of course, is the principle of the apple for the teacher, and the Christmas box of cigars for the local precinct captain or the traffic policeman.

The sacred character of gifts is well known, and no doubt the gift idea is very close to that of sacrifice to a deity. Not uncommonly the gift was a hapless human victim who was sacrificed on the altar. The Bible abounds with instances of prescribed gifts to a deity, and one can toil through long lists of talents of silver, and of he-goats and she-goats. A worshiper consulting an oracle invariably brought a gift, for man has always attempted to pry into the future; today some of us give a coin to the turbaned lady or gentleman who "reads the tea-leaves" in our cup.

Of late years anthropology has prided itself on being a practical science; one has a right therefore to search the literature for pragmatic suggestions. It would appear that recently wedded brides in some primitive communities have original ideas of the nature of a gift, and how it should be solicited. Following the ceremony, newly wedded girls refuse to cross the threshold, or even to be carried into the home the husband has provided. And they remain obdurate until the husband's relatives have appeared with wedding gifts of a type that meet with their approval.

IF YOU HAVE FOREIGN MAPS THE ARMY CAN USE THEM

Large scale maps, preferably not less than 1:500,000, of areas outside of the continental United States and Canada are sought by the Army Map Service (Corps of Engineers, U. S. Army). Detailed topographic maps and city plans are deemed especially valuable. Aerial photographs, survey notes and geodetic control data will be no less welcomed. The more authoritative and the more recent the publication the better, the officers emphasize.

Readers of FIELD MUSEUM NEWS possessing maps which might be of use are requested to communicate with Army Map Service, Chicago Library Branch, 79 West Monroe Street, Chicago (telephone: CENtral 3240). Material which the owner may require to be designated as confidential will be made available only to authorized Army personnel.

Complete files of Government issuances and such obvious sources as the National Geographic Society are already on hand—such data are not desired.

DECEMBER SUNDAY LECTURES TELL STORY OF METEORITES

"Mysterious 'Night-Riders' of the Sky" is the title of the lecture to be presented each Sunday afternoon during December by Mr. Paul G. Dallwig, the Layman Lecturer.

Mr. Dallwig will explain the difference between comets, meteors, and meteorites, and tell the story of many of the most important meteoritic

"falls." A special feature of the lecture will be his dramatization of an imaginary trip to the moon, all observations being based on known scientific facts regarding that satellite. Mr. Dallwig presents this "tabloid air tour" in three parts: Scene 1—The Take-off by Rocket Plane; Scene 2—The Trip through the Stratosphere; Scene 3—A Day on the Moon. The lecture will be illustrated with exhibits in several halls of the Museum's Department of Geology.

The Sunday afternoon Layman Lectures begin promptly at 2 P.M. The heavy demand by the public, 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).

Due to engagements for lectures in various parts of the country, Mr. Dallwig will not appear at Field Museum on Sundays during January, but will resume his Field Museum schedule in February when he will present "Digging Up the Cave Man's Past." On Sundays in March he will speak on "Who's Who in the Mounted Zoo," and in April his subject will be "The Romance of Diamonds from Mine to Man."

PROGRAM OF LECTURE TOURS FOR WEEKDAYS IN DECEMBER

Conducted tours of exhibits, under the guidance of staff lecturers, are made every afternoon at 2 o'clock except Sundays, and certain holidays. There will be no tour on Friday, December 25, when the Museum will be closed for the Christmas holiday, and none on Saturday, December 26, although the Museum will be open to visitors on the latter.

On Mondays, Tuesdays, Thursdays, and Saturdays, general tours are given, covering outstanding features of all four departments—Anthropology, Botany, Geology, and Zoology. Special subjects are offered on Wednesdays and Fridays; the schedule of these follows:

Wednesday, Dec. 2—Animals of the Jungles (Miss Elizabeth Best).



Friday, Dec. 4—Primitive Weapons of Offense and Defense (Miss Loraine Lloyd).

Wednesday, Dec. 9—Winter Birds of the Chicago Region (Miss Marie Pabst).

Friday, Dec. 11—The Carved Jades of China (Miss Miriam Wood).

Wednesday, Dec. 16—Life Usually Unseen (Miss Elizabeth Best).

Friday, Dec. 18—Effects of Climate on Man (Miss Loraine Lloyd).

Wednesday, Dec. 23—Christmas Trees and Plants (Miss Marie Pabst).

Wednesday, Dec. 30—Color in the Animal Kingdom (Miss Elizabeth Best).

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

FILM ABOUT CHICAGO MUSEUMS NOW BEING SHOWN

"Background for Tomorrow," a feature-length talking motion picture telling the story both of the exhibits and of the "behind the scenes" activities of Chicago's several great museums, is now released for showings to high schools, parent-teacher groups, and other groups interested in education and civic activities.

The opening reels deal with the work of Field Museum of Natural History, showing work in progress in the taxidermy shops, paleontological laboratories, and anthropological diorama-making studios, as well as some of the principal features of the exhibits, such as the prehistoric man groups in the Hall of the Stone Age of the Old World, the Races of Mankind sculptures, outstanding habitat groups of mammals, birds, and fishes, and fossil skeletons and restorations in Ernest R. Graham Hall of historical geology. The sound track narrative accompanying the Field Museum section of the film is by Don Gordon, well-known radio commentator. The other museums whose work is shown are the Chicago Academy of Sciences, Oriental Institute of the University of Chicago, the Art Institute of Chicago, Chicago Historical Society, and the Museum of Science and Industry. The film is sponsored by the Chicago Association of Commerce, and was produced by Atlas Productions, Inc. The scenario was prepared by Mr. John G. Curtis, and film direction is by Mr. Bertram Bates. The "cast" includes many members of Field Museum's staff, shown in the performance of specialized work.

Gem Colors

Although many of the gems in H. N. Higinbotham Hall reveal the true color of the mineral, the color of others (as, for example, the amethyst) comes from particles of pigmentary matter impregnating the stone often in quantities so minute as almost to defy detection by chemical analysis.

GIFTS TO THE MUSEUM

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

Department of Anthropology:

From Leonard Spruell, Coolidge, Ariz.—2 Hohokam jars, southern Arizona.

Department of Botany:

From New York State College of Forestry, Syracuse, N. Y.—249 herbarium specimens, Guatemala, British Honduras, and Turneffe Island; from Dr. Victor Wolfgang von Hagen, Santa Monica, Calif.—9 specimens of Mexican plants and paper prepared from them; from Dr. Herman Kleerekoper, Porto Alegre, Rio Grande do Sul, Brazil—51 specimens of algae, Rio Grande do Sul; from Mrs. Joan Bader Bockelmann, West New York, N. J.—118 specimens of algae, Massachusetts, New Jersey, and New York; from Harry K. Phinney, Albion, Mich.—69 specimens of algae, and 51 of cryptogams, Michigan; from Dr. Walter Kiener, Lincoln, Neb.—123 specimens of algae, Nebraska and Colorado.

Department of Geology:

From Dr. Frederick W. Burcky, Evanston, Ill.—58 agate, chalcedony, and carnelian fragments, New Mexico; from Professor Lincoln La Paz, Columbus, Ohio—3 tektites, Texas.

Department of Zoology:

From Walter F. Webb, Rochester, N. Y.—142 specimens of land shells, Philippine Islands; from Captain S. G. Law, Camp Haan, Calif.—2 snakes; from William Beecher, Chicago—2 snakes and 9 lizards, Arkansas; from Chicago Zoological Society, Brookfield, Ill.—an infant kinkajou, a spectacled langur, and a puff adder; from Richard Edgren, Chicago—10 salamanders, a garter snake, and a musk turtle, Wisconsin; from Gordon Gunter, Rockport, Tex.—a coral snake, Texas; from Henry S. Dybas, Chicago—17 specimens of land snails and isopods, Tennessee, Indiana, and Illinois; from Dr. Charles E. Burt, Winfield, Kan.—21 snakes, Kansas; from E. Ross Allen, Ocala, Fla.—a coral snake, Florida.

The Library:

Valuable books from Dr. Henry Field, Washington, D.C.; and from Henry W. Nichols, Leon L. Walters, and Paul C. Standley, all of Chicago.

NEW MEMBERS

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

Associate Members

Mrs. Jerome G. Abeles, W. P. Bair

Annual Members

Robert N. Chatain, Mrs. John E. Cornell, Norman Bridge Eaton, Ning Eley, Ellsworth Goldthorp, William H. Hinchliff, Jr., William J. Hough, Frank S. Howard, John H. Lee, R. C. McCaw, Dr. Charles A. Meyer, William C. Meyer, Elmer E. Mills, C. G. Muench, Mrs. James Norris, Mrs. Charles W. Rockhold, Earl M. Schwemm, James W. Starrett, Wilbur L. Walton, S. J. Weinress.