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PANGOLINS, TARSIERS, AND FLYING LEMURS OF PHILIPPINES

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THE title of this preliminary note on the Museum's Philippine Expedition, which has been operating for more than a year in Luzon, Mindanao, and Palawan, might easily be extended to fill all of the space in a number of the BULLETIN with the mere catalogue of names of strange animals collected, among which only the words pigs, deer, and monkeys would have a familiar sound to non-zoological readers. Shrews, civets, and rare rodents; hornbills, parrots, and monkey-eating eagles; arboreal earthworms, colorful land snails, and giant centipedes; mosquitoes, bird-lice, and ticks; and insects, insects, and more insects will be enumerated in the accessions and catalogues and scientific reports dealing with the incoming collections.

The Museum's Philippine Zoological Expedition of 1946-47 results from the pre-war interests of several American GIs, two of whom had been involved in the mosquito-control work of the Sanitary Corps and the Medical Corps in the Far East. At the end of the war, Captain Harry Hoogstraal, finding himself in the Philippines with Captain Anthony de Vos, of the Royal Netherlands Air Force and formerly of the staff of the great Buitenzorg Museum in Java, planned first of all to spend a year on the great spider-shaped East Indian island Celebes. When political disturbances and the necessity of repatriating Japanese prisoners made it impossible to work any-

where in the Netherlands Indies, Captain de Vos resigned from the project and came to America to continue his education.

Lieutenant Donald Heyneman then joined with Captain Hoogstraal in the alternative plan to collect mammals and birds, reptiles

study in the Philippines but had never acquired a representation of the Philippine animal life. Captain Hoogstraal had long been favorably known to the Museum for his promotion of zoological and botanical collecting in Mexico. A year's expeditionary work was accordingly approved by this institution.

The party began work in the high mountains of northern Luzon, famous in museum circles as a zoological "type locality" from the remarkable variety of curious or primitive rodents discovered there by the British collector John Whitehead. Most of these rodents are externally rat-like, but with extraordinarily modified dentition. Some are large and very un-rat-like, although still related to the true rats. Whitehead had collected on Mt. Data, which rises to an elevation of more than 10,000 feet, and the Hoogstraal party set up its camps

on the same mountain. The Mt. Data collections, by a not unfamiliar mischance, arrived at the Museum only in June of the following year, more than a year after they were collected.

Desiring to strengthen Captain Hoogstraal's party for insect and invertebrate collecting, in line with the general desire to strengthen the Division of Insects in the Museum, Mr. Floyd G. Werner, of Ottawa, Illinois (quite recently from Okinawa), was attached to the party. Mr. Werner joined forces with Hoogstraal and Heyneman in southern Mindanao, planning to make a frontal zoological attack on two of the high mountains northeast of Davao, Mt. Apo



THE TARSIER, REMOTE RELATIVE OF MAN

This strange-looking lemuroid primate is well represented in the collections of the Philippines Expedition, and the specimens will be used at the Museum in important research projects.

and amphibians, fresh-water fishes, and insects and land invertebrates of all kinds in the Philippines. It was their especial desire to profit by the existence of surplus Army equipment and of Army facilities. By co-operation with the personnel of the bomb-and-fire-destroyed Philippine Bureau of Science, it was hoped that their operations might be greatly extended and that preliminary steps might also be taken to build up collections for a new Philippine National Museum.

This plan had much obvious intrinsic merit as a project for Chicago Natural History Museum, which had conducted extensive anthropological collecting and



MOUNTAINS OF THE PHILIPPINES

Scene in the region combed by the Museum expedition. Mt. Apo and Mt. McKinley challenge the zoological collector.

and Mt. McKinley. The field collectors of the Philippine Bureau of Science greatly strengthened the small American personnel; it is to be hoped that this co-operation may prove an effective step in the rehabilitation of natural science in the new Philippine Republic.

Though a considerable by-product of exhibition material will accrue from the collections of the Philippine Expedition, the main emphasis in both plans and operations has been upon material intended for immediate research, collections to strengthen the reference collection in the Museum, and observation in the field. One scientific paper, based on these collections, "A New Species of *Tripteroides*," by F. E. Baisas of the Bureau of Health in Manila, describing a new species of mosquito, has already been published.

ISLANDS PRESERVE FAUNAS

The zoological interest of the Philippines lies in a combination of tropical wealth of life with insular and regional peculiarity. Islands may preserve primitive forms from extinction, as seems to be indicated by some of the strange rodents of Mt. Data in Luzon; island archipelagos may exhibit a profoundly interesting study of the origin of species in all stages and degrees in their insular species and chains of species; and, in the relations of the animal life from island to island, past land connections and directions of immigration of the land life of the region may be indicated. In a region so complex as the East Indies, analysis of the living plants and animals forms an important means of study of the basic geography.

To remark further only upon the mammals, the results of the expedition in this group alone suffice to make it a most notable one. The curious rodent genera of Mt. Data exhibit extraordinary modifications of

skull and dentition that pose new and still unsolved problems of functional anatomy. The tree shrews of the southern islands have only recently been transferred from the shrews to the lowest place in the order Primates, to which man belongs. This gives extraordinary anatomical and evolutionary interests to this group. These interests may be extended directly to the ground shrew *Podogymnura*, which has long been known only from a single specimen; it was collected in considerable numbers by the Hoogstraal party, and several specimens were ade-

quately preserved for anatomical study. This animal is an almost ideal living generalized mammal, essentially a "living fossil." Its anatomy will yield insights into the evolution of the mammals that are otherwise unobtainable.

RELATIVE OF MAN

Also because of its remote relations to man, the tarsier, a strange-looking and otherwise remarkable lemuroid primate, has had much attention from anatomists. This arboreal creature, with toes modified like those of a tree-frog or gecko for clinging to branches, has been difficult to obtain because of its small size and nocturnal habits. It seems at first astonishing and even horrifying that the Philippines party should have collected no less than eighty specimens of so rare an animal. But sudden abundance of a supposedly rare creature is by no means an unfamiliar experience to a museum collector, for rarity is more often apparent than real.

The tarsiers were obtained when their jungle habitat was cleared away for a Manila hemp plantation. Since the surrounding forest was undoubtedly already filled to its full carrying capacity with tarsiers, it is doubtful if many could have survived even if transported to the neighboring uncut forest. Vastly greater destruction of tarsiers obviously has taken place and continues inevitable wherever original forest is being cleared for agricultural use.

The scientific interest of the tarsier as to anatomy and behavior is very great, and it appears that the Museum's series will be



JUNGLE CLEARING ON PHILIPPINES EXPEDITION

Numerous tarsiers and other animals desired for the Museum collections were disclosed by these operations. Inset: The tarsier. Its zoological interest is in inverse proportion to its size; it can be held in the palm of a man's hand,



THE PANGOLIN

Otherwise known as a scaly anteater, this creature represents a Bornean element in the Philippine fauna.

put to excellent scientific use. Research Associate A. A. Dahlberg has undertaken a report on the individual variation of the dentition and its succession. Among recent visitors to the Museum's Division of Anatomy, Dr. H. W. Mossman of the University of Wisconsin and Dr. C. O. Bechtol have signified their interest in undertaking special studies on our tarsiers. The disproportionately large eye, which appears to be fixed in a forward direction, together with a great movability of the head, which appears to rotate through 180° on the neck, suggests both anatomical and behavioral problems. It is to be hoped that Major George Wharton, engaged in collecting for the United States National Zoological Garden, may be



TREE SHREW

These inhabitants of the East Indian region are the most primitive of the Primate relatives of man.

successful in bringing back tarsiers alive. Major Wharton will deliver the expedition's live monkey-eating eagle (one of the great rarities among Philippine birds) to the Brookfield Zoo.

FLYING LEMURS

Still another of the remarkable mammals of Mindanao is the so-called "flying lemur,"

an insectivorous mammal that is so highly modified that its relations to the insectivores proper and to the lemurs are obscure. This creature exhibits the extreme of development of gliding flight among mammals; it is provided with membranes between the fore and hind limbs, like those of a flying squirrel, but these extend also between tail and hind limbs and the chin and forelimbs. The Museum had two specimens of the flying lemur, neither in good condition; the Philippine collection contains thirty specimens.

Of less immediate scientific importance, but of the most spectacular public and general interest, is the pangolin, or scaly anteater, shown hanging by its tail from the hand of a Philippine collector in one of the accompanying illustrations. The large overlapping scales of this strange mammalian type give it a superficial resemblance to a reptile, and specimens have sometimes been delivered to the reptile departments of museums as a result. The pangolin, like other termite-eating types, has lost its teeth in the course of evolution. Like the flying lemur, the pangolins represent a distinct and most peculiar order of mammals.

SUMMER GUIDE-LECTURE TOURS,
MORNINGS AND AFTERNOONS

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

Mondays: 11 A.M., The Earth's Green Mantle (General survey of the plant exhibits); 2 P.M., General Tour (Exhibition halls, all Departments).

Tuesdays: 11 A.M., The People of the World (General survey of the anthropology exhibits); 2 P.M., General Tour.

Wednesdays: 11 A.M., The Earth's Story (General survey of the geology exhibits); 2 P.M., General Tour.

Thursdays: 11 A.M. and 2 P.M., General Tours.

Fridays: 11 A.M., The World of Animals (General survey of the animal exhibits); 2 P.M., General Tour.

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

Wyoming Fossil-Field Trip

A field trip to the Washakie Basin in southern Wyoming was concluded by Dr. Rainer Zangerl, Curator of Fossil Reptiles, on June 5. The Washakie formation is of late Eocene age and its fauna is relatively poorly known. Among the more important results of Dr. Zangerl's exploration are the discovery of a turtle-crocodile-fish graveyard covering a large area, a well-preserved shell of a large land turtle, and a fine skull of a soft-shell turtle.

SIX SUMMER MOVIE PROGRAMS
OFFERED FOR CHILDREN

The annual summer series of free motion picture programs for children on Thursday mornings during July and August will open July 10. The series is presented under the auspices of the James Nelson and Anna Louise Raymond Foundation. Six programs will be given featuring films on natural history and travel; animated cartoons will be included on four.

The entertainments will be given in the James Simpson Theatre of the Museum at 10:30 A.M. Children are invited to come alone, accompanied by parents or other adults, or in groups from clubs and various centers. Admission is free. Following are the dates and titles of the films:

July 10—THUNDERHEAD

A story sequel to "My Friend Flicka."

July 17—REALM OF THE WILD

Wild game and birds of our National Parks.

Also a cartoon.

July 24—SUMMER ADVENTURES FOR ALL

Ideas for a vacation near home.

Also a cartoon.

July 31—PUSS IN BOOTS

Also a cartoon.

August 7—ADVENTURES OF CHICO

The story of a Mexican Indian boy.

August 14—ANIMAL TALES

Also a cartoon.

Central America Botanical Expedition
Reports Recent Progress

Recent reports from Mr. Paul C. Standley, Curator of the Herbarium, indicate that the expedition that he is leading is making substantial progress. Most of the time since Mr. Standley left last November has been spent in El Salvador and Honduras. Many different localities were visited in these countries and many species hitherto unknown from these areas were found, e.g., a number of species previously known only from Guatemala have thus been added to the flora of Honduras. During the early part of May, the expedition moved to Nicaragua, the least known of the Central American countries. Here many important discoveries are expected during the course of exploration in the next few months.

Paleontology Expedition to Colorado

An expedition to collect specimens of prehistoric mammals in the vicinity of Mesa, Colorado, left the Museum June 9. Mr. Bryan Patterson, Curator of Paleontology, is leader. He is accompanied by Mr. James H. Quinn, Chief Preparator in Paleontology, and Mr. William Turnbull, Preparator.



Schmidt, Karl Patterson. 1947. "Pangolins, Tarsiers, and Flying Lemurs of Philippines." *Bulletin* 18(7), 1-3.

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