



Fig. 1: Dr. Robert F. Inger and Mr. F. Wayne King display anti-leech stocking to be worn for protection against land leeches in Borneo.

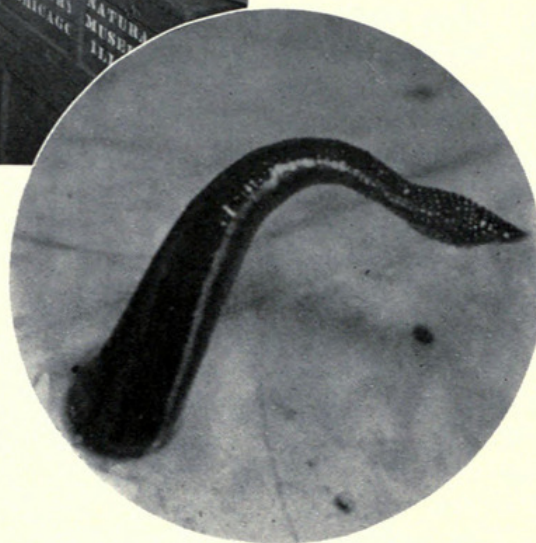


Fig. 2: Land leech posed on a leaf and reaching out for a victim (actual size of leech about one and one-half inches).

THE Borneo Zoological Expedition, 1962, will leave Chicago on August 18. It would be more correct to say that the personnel—Dr. Bernard Greenberg of Roosevelt University, Mr. F. Wayne King of University of Chicago, and myself—will leave then. For the equipment and the supplies left in June.

The main purpose of the expedition is to gather information on the breeding activity of frogs living in the tropical rain forests that cover most of Borneo. Frogs and toads living in the Temperate Zones generally have relatively short breeding periods restricted to a part of spring. We suspect, on the basis of fragmentary information, that in tropical rain forests, which are warm and wet at all times, frogs and toads breed all year round.

Most zoologists now think that the major groups of frogs and toads evolved in the wet tropics. As the breeding patterns are important to the evolutionary success of any kind of animal, we must learn what they are in tropical frogs.

The field work connected with this

research program will consist of collecting monthly samples of about six species of frogs, making notes on their behavior, and recording daily rainfall, temperature, and relative humidity.

We also need to know how far an individual frog (of the species we will study) moves and how fast it matures in order to understand the full implications of its breeding habits. To get this information we plan to mark, measure, and release frogs along several forest streams. By recapturing (hopefully!) a number of these marked frogs, we will learn not only their rates of growth and movement but also how large the populations are.

As time permits, we will work on other field studies, all aimed at increasing our knowledge of the distribution and interrelationships of the animals in the rain forest. One of these problems, an investigation of the reptiles and amphibians living in epiphytic plants, will be the special concern of Mr. King. Epiphytes are plants, such as bird's nest ferns, pitcher plants, and orchids, that

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grow attached to trees and whose roots do not reach the ground. Mr. King will try to discover not only what species of reptiles and amphibians live in such plants but also their abundance, their vertical distribution, and the weather conditions under which they live.

What collecting is done on this expedition will be subordinated to solving the particular biological questions raised by study of material previously collected during the Museum's Borneo Zoological Expeditions of 1950 and 1956.

Though we are concerned primarily with the biological problems, we are naturally forced to consider logistical ones. What supplies and equipment will we need? When and how do we ship them? The second question is easy to answer, merely requiring a telephone call to one of the export agents in Chicago. The answer to the first question depends on our previous experience in Borneo and the specific projects we will tackle in the field.

Out of curiosity, we counted the different kinds of items we are taking into the field. We found we had 173, not including our field clothing. Many of these items are strictly for housekeeping: for example, we have three packets of sewing needles, a folding table, an alarm clock, two can openers, three jungle hammocks, and similar uninspiring but vital equipment. Collecting equipment includes 30 snake bags, two potato rakes (for tearing apart rotting logs), 500 blow-gun corks, three headlights, dip nets, etc. For preserving and packing specimens we have—among many other things—5,000 numbered tags, 2,000 plastic bags, 115 pints of formalin, three plastic hydrators, and dissecting instruments.

We also have some delicate instruments such as a hygrometer with a 200-

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foot extension cable, which we will use for reading the temperature and relative humidity in the bird's nest ferns, and a recording thermohumidigraph (Fig. 3) for use in more accessible places. In addition to these we have a tape recorder, rain gauge, clinometer (for measuring heights of trees and epiphytes,) compass, surveyor's tape, and assorted photographic equipment.

As the success of any expedition nowadays depends upon the quality and quantity of field notes, we have paper, notebooks, waterproof ink, and pens.

One piece of field clothing requires special mention—anti-leech stockings (Fig. 1). The humid forests of Borneo are rich in land leeches and in some areas and times every leaf of every bush seems to have a hungry leech reaching out for the next passerby (Fig. 2). These animals are interesting, but their fondness for human blood makes protection against them important. We learned on previous trips that an over-stocking made of muslin and tied over one's trousers below the knee cut down the leech bites significantly.

With the exception of one item, we are taking no food from here. All of that will be purchased in Borneo. The exception consists of two cans of high-protein pablum—not for us, but for the tadpoles we hope to raise.

All this material, believe it or not, fit into 15 medium-sized boxes. With such an assortment of things, the contents of each box had to be listed and the boxes numbered. Museum men always have in their minds the horrible example of the large expedition (not from this institution, we hasten to add) that arrived at its base camp with 100 boxes and not a single packing list.

Months ago a tentative field base was

selected on the basis of our previous experience in Borneo and study of our collections. The chosen site was in Sarawak and we applied for and received permission to work there from the authorities in Sarawak.

In many ways this expedition reflects the national and international cooperation vital to scientific progress. Mr. Tom Harrison, Curator of the Sarawak Museum, has graciously offered to continue the cooperation and help he gave previous expeditions of Chicago Natural History Museum. Similarly, other agencies of the Government of Sarawak have been helpful as in the past. Our Museum hopes that previously published results of our work on the Bornean fauna and future publications growing out of this expedition will be of value to the government and people of Sarawak.

At the national level, the expedition is largely financed by the National Science Foundation. Part of the cost, however, will be borne by Chicago Natural History Museum and Roosevelt University. Finally, the field work and subsequent research will be carried out by representatives of three Chicago institutions—our Museum, Roosevelt University, and the University of Chicago.



Fig. 3: Thermohumidigraph for recording temperature and relative humidity is placed in field chest for shipment to Borneo.

BATS—

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girl in our company had been bitten by a vampire bat on the very tip of her nose. The child felt nothing and apparently suffered no ill effects. The next three nights of our journey were spent in the same way and each morning we discovered that another bit of the tip of the girl's nose had been sliced away and oozed blood. During these nights all of us were equally exposed to vampires. Yet, a single bat preyed on the same victim night after night. Was it the same bat that attacked the child each night in successively different camps or was it a different bat each night? Did the vampire prefer the girl because of a predilection for her type of blood or because she slept more profoundly than the others?

Years later, in Suriname, I achieved a more intimate acquaintance with a vampire bat. Sleeping accommodations for the first night on the banks of my Saracca River camp in Suriname were provisional. I used a hammock as did also our native assistant, while my companion, Dr. Jack Fooden, rolled himself in a blanket and slept on his cot. Mosquitoes were absent and no netting was used. Minutes after turning off the kerosene lantern and dropping off to sleep I was awakened with a violent start by a sharp pain on the big toe of my left foot. A vampire bat had bitten me. (It is strange that some victims are awakened by the attack of a vampire bat, while others sleep soundly through repeated attacks.) With the aid of a flashlight I saw that a thin sliver of skin about one-half inch long had been sliced out of my toe. A finely honed razor could not have cut more neatly. I bandaged the bleeding toe with a handkerchief, covered my feet with a sheet and wrapped the edges of the hammock around me. All the while the hungry bat remained in attendance, now flying back and forth, now hanging nearby in watchful expectancy. I spent the early part of the night warding off attacks made by the animal each time it thought I had fallen asleep. The vampire finally

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