

## PERIPATUS—'LIVING FOSSIL' AND 'MISSING LINK'

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Few zoologists in the United States have seen a live "peripatus"—a peculiar worm-like animal that has been regarded, with some reason, as being both a "living fossil" and "missing link." Consequently, it was with more than usual interest that staff members recently greeted the arrival of four live *Peripatoides novae-zealandiae* (see Figures 1, 2) that were sent to the Museum by Mr. B. M. Bary of Victoria University College, Wellington, New Zealand. While attending the Seventh Pacific Science Con-

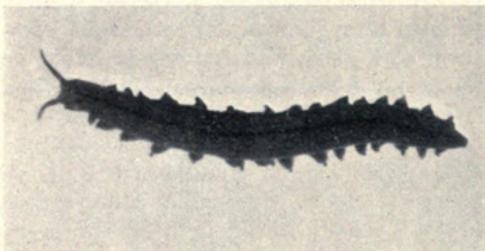


FIGURE 1

One of the four live *Peripatoides novae-zealandiae* received from New Zealand. View from upper side.

gress in New Zealand earlier this year, Chief Curator Karl P. Schmidt met Mr. Bary and expressed such interest in acquiring some live specimens of this animal that the unusual shipment resulted.

### BILLION-YEAR ANCESTRY?

These remarkable creatures belong to the Phylum Onychophora, an extremely ancient group that has existed for at least one-half billion years. A fossil form, *Ashyeyaia pedunculata* (see Figure 2), has been described from Middle Cambrian deposits of that age. The illustration shown is of a hypothetical reconstruction, but the actual fossil specimens show most of the details of the external structure rather clearly.

If the fossil described as *Xenusion auerswaldi* (see Figure 2) actually represents an onychophoran or onychophoran-like animal, as it seems to, then the beginnings of the group might be extended back another one-half billion years, for *Xenusion* is from Proterozoic Algonkian rocks that are approximately a billion years old. Judging from the deposits in which these fossil forms were found, the early Onychophora were marine.

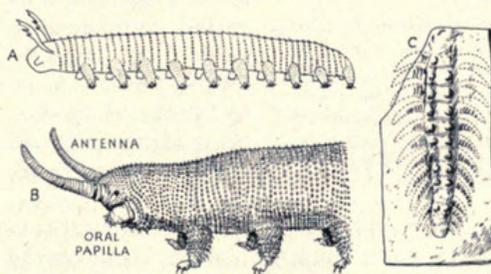
The living species are terrestrial. They are few in number—about eighty species—and occur in the West Indies, Central and South America, South Africa, and the Indo-Australian region. Although they are terrestrial and have special breathing tubes known as "tracheae," they are restricted to very moist environments; their thin skin makes them subject to very rapid desiccation. They generally avoid light and live

in rotten logs, under stones, under loose bark, etc., where they feed on small insects and other micro-organisms. Most of the species are small—about 2 to 3 inches long—but at least one attains a length of 5 inches.

One of the interesting protective adaptations of these animals is the ability to squirt a sticky, slime-like secretion that effectively tangles their enemies. The slime is secreted by long internal slime glands that extend almost the entire length of the body and is ejected from a pair of "oral papillae" (see Figure 2), of which one is on each side of the head. Certain species can squirt the slime as far as twelve inches. Some Onychophora lay eggs. Others give birth to living young; in such species, special placenta-like structures may develop to facilitate the diffusion of nutrient materials through the uterine wall of the mother to the developing embryo, in much the same fashion as in mammals.

### WORM-ARTHROPOD LINK

It is not only because of their great antiquity that the Onychophora excite the curiosity of the zoologist. An even greater fascination lies in the fact that these animals possess anatomical features both of the segmented worms (Annelida), of which the common earthworm is a familiar example, and the Arthropoda, the great phylum that contains the crabs, lobsters, shrimps, spiders, scorpions, millipedes, centipedes, and insects. There can be little doubt that the arthropods evolved from worms or worm-like ancestors, and many zoologists consider that the Onychophora are an intermediate or linking group between the worms and the arthro-



Drawings after Snodgrass

FIGURE 2

(A) *Ashyeyaia pedunculata*, a fossil form from Middle Cambrian—hypothetical restoration; (B) *Peripatoides novae-zealandiae*—side view of head end of body; (C) Fossil of *Xenusion auerswaldi*, from Proterozoic Algonkian.

Pods. It is more probable, though, that the Onychophora represent an offshoot from the main line of evolution between the two. Interestingly enough, the first peripatus described was considered a mollusk! It was not until after careful anatomical studies had been made that its position in the animal kingdom was appreciated.

Before the war, Dr. Ralph Buchsbaum, Research Associate in Zoology at the University of Chicago, and Mrs. Buchsbaum,

## Books

(All books reviewed in the BULLETIN are available in The Book Shop of the Museum. Mail orders accompanied by remittance are promptly filled—The Book Shop pays the postage on shipments.)

**TEMPLES IN YUCATAN: A Camera Chronicle of Chichén Itzá.** By Laura Gilpin. Hastings House, New York, 1948. 124 pages, 103 photographs, 4 maps. \$5.

Chichén Itzá is probably the most famous of the ruined Maya cities that dot the peninsula of Yucatan. Laura Gilpin's handsome book on this sacred center of the early Mayas will stir any reader's interest in Chichén's magnificent structures, while the volume also serves as a stimulating introduction to the civilization of the ancient and modern Mayas.

*Temples in Yucatan* is primarily a collection of photographs. These are of exceptional esthetic quality and also are carefully chosen to illustrate the unique style of Maya architecture and its local development at Chichén. In addition, the inclusion of the life of the modern Mayas as photographic subject matter serves to tie the ancient city to the modern descendants of the city's original builders.

This camera chronicle is supplemented by a brief and clearly written text and captions. Enough information is given to set the photographs in meaningful context. An example is the section on the importance for Maya religion and architecture of the Maya calendar. A number of carefully drawn maps show the spatial arrangement of Chichén Itzá's major temples and buildings, without including meaningless and confusing detail. The format is technically excellent and artistically pleasing.

The prominence of Chichén Itzá led to its being chosen the subject of a recently completed model diorama in the Museum's new hall of American archaeology. *Temples in Yucatan* is recommended reading to accompany this diorama and the Museum's other exhibits on the Maya Indians, and to deepen the reader's understanding of Maya civilization.

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collected a species of *Macroperipatus* in the Panama Canal Zone and were fortunate enough to bring it back alive to Chicago. They were able to make excellent photographic studies, both still and motion-picture, over a period of several months. The Museum specimens were probably the only other live Onychophora ever to reach Chicago. Unfortunately, they lived only long enough for interested staff members to observe them briefly and take a few still and motion pictures.



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