

ZOOLOGY

Chairman: W. H. HEADLEE, Indiana University School of Medicine

Professor W. R. Breneman, Indiana University, was elected chairman of the section for 1945.

The trematode parasites of a species of *Goniobasis* from the Tippecanoe River, Indiana. R. M. CABLE and LOIS KRAUS, Purdue University.—During September and October, 1944, 1,367 specimens of an undetermined species of *Goniobasis* were collected from Tippecanoe River and examined for larval trematodes. The incidences of infection, based on the spontaneous emergence of cercariae from the isolated snails, were as follows: two (0.15 per cent) were infected with a giant-tailed echinostomoid cercaria, probably a new species of larval psilostome; one (0.075 per cent) with a slender-tailed psilostome cercaria; one (0.075 per cent) with a pleurolophocercous form; two (0.15 per cent) with *Cercaria megalura* Cort; three (0.22 per cent) with a notocotylid monostome cercaria; three (0.22 per cent) with a cotylomicrocercous form; five (0.37 per cent) with one of two species of xiphidiocercariae of the Pusilla type and 36 (2.63 per cent) with the other; seven (0.51 per cent) with one of two species of Virgula type xiphidiocercariae and 17 (1.24 per cent) with the other. Five additional snails were infected with stylet cercariae but died before final identification could be made. Both of the Virgula type xiphidiocercariae are new species being reported elsewhere and certain of the others may prove to be new upon further study.

Studies on four new species of xiphidiocercariae of the Virgula type (Trematoda: Digenea). PHILIP G. SEITNER, Purdue University.—Examination of prosobranch snails collected within a limited radius of Lafayette, Indiana, has revealed the presence of four new species of xiphidiocercariae of the Virgula type, in addition to the single species reported by the writer a year ago. This makes a total of six species of Virgula cercariae reported from the United States. All Indiana species have the same number of cephalic glands (three pairs), but differ in the arrangement of their ducts, size of body and Virgula organ, and shape and size of the stylet. There also are differences in spination, particularly in respect to the tail which is aspinose in one species, spinose with slightly larger spines at the tip in two species, and aspinose except the tip in the remaining species. One occurs in a species of *Pleurocera* collected from Eel River, near North Manchester, and another in the same host species taken from the Tippecanoe River. The two remaining cercariae develop in a species of *Goniobasis* from the Tippecanoe River. A fifth species found in *Goniobasis livescens* from Wea Creek may be identical with the one hitherto reported from McCormick's Creek.

Notes on the incidence, biology and medical importance of parasites of man in Indiana. WILLIAM HUGH HEADLEE, Indiana University Medical Center.—Records show that a considerable number of animal parasites of man are present in Indiana, including some Arthropods that are important in the transmission of parasites or other disease agents, and/or that are of importance because of their role as ectoparasites or pests of man. Stools were examined from 2,875 individuals, and the percentage incidence of the intestinal parasites found are given in parentheses following the name of the organism. Protozoa recorded were *Endamoeba histolytica* (1.2), *Endamoeba coli* (36.8), *Endamoeba gingivalis*, *Iodamoeba bütschlii* (2.6), *Giardia lamblia* (3.2), *Chilomastix mesnili* (2.6), *Trichomonas hominis* (0.14), *Trichomonas vaginalis*, *Plasmodium vivax*, and *Plasmodium falciparum*. The helminths recorded were *Ascaris lumbricoides* (0.14), *Trichuris trichiura* (0.17), *Necator americanus* (0.1), *Strongyloides stercoralis* (0.9), *Enterobius vermicularis* (3.3 by stool examination; 16.9 of 295 individuals from which perianal scrapings were examined), *Hymenolepis nana* (0.14), *Taenia spp.* (0.07), *Dipyllobothrium latum* (2 cases) and *Dipylidium caninum* (1 case). In addition, one infection each of *Schistosoma mansoni* and *Clonorchis sinensis* were found, but these were not native cases.

A list of the more important Arthropods found in Indiana is presented including the following: *Diaptomus oregonensis*, *Cyclops prasinus*, *Cyclops viridus brevispinosus*, *Lithobius forficatus*, *Latrodectus mactans*, *Dermacentor variabilis*, *Trombicula irritans*, *Pediculoides ventricosus*, *Pediculus humanus capitis*, *Pediculus humanus corporis*, *Phthirus pubis*, *Sarcoptes scabiei*, *Cimex lectularius*, *Anopheles quadrimaculatus*, *Anopheles punctipennis*, *Culex pipiens*, *Aedes aegypti*, *Sarcophaga hemorhoidalis*, *Sarcophaga bullata*, *Oestrus ovis*, *Lucilia sericata*, *Chrysops sp.*, *Pulex irritans*, and *Xenopsylla cheopis*.

Data are presented concerning the occurrence in Indiana of some of the diseases caused by helminths, protozoa, rickettsiae and viruses which are transmitted by Arthropods or for which Arthropods serve as an intermediate host.

Further observations on factors influencing hypoxic resistance in mice. WM. A. HIESTAND and HELEN ROGERS MILLER, Purdue University.—The effects of such factors as rate of barometric decompression, carbon dioxide, starvation, carrot diet, dehydration, and air temperature on hypoxic survival of mice have been investigated. Our results have demonstrated the following facts, some of which are corroboration of earlier work, others of which are unique.

Mice tolerate hypoxia best if decompressed slowly (approximately 674 feet per second as an average). Prolonging the rate too greatly results in earlier failure of the mice.

Carbon dioxide has no significant effect on hypoxic survival not being beneficial to greater tolerance.

Inanition decreases hypoxic resistance in direct proportion to the duration of the starvation.

An exclusive diet of carrots for 10 days increases the resistance of

mice to anoxia which is apparently related to water loss from the tissues. Dehydration up to approximately 20 per cent of total body weight significantly increases hypoxic resistance, beyond 20 per cent diminishes resistance.

Reduction of the temperature of the surrounding air increases hypoxic resistance in direct proportion as the air temperature is lowered.

It is likely that dehydration as well as lowering of external air temperature decrease the rate of metabolism of the mice thereby increasing hypoxic resistance.

Effects of spatial restriction upon defensive fighting of male mice. J. P. SCOTT, Wabash College.—Untrained adult males of the C-57 strain of mice were subjected to severe attacks by trained fighters of the same strain, first in large multiple escape pens and later in small boxes, for periods of 30 minutes each. In accordance with previous observations, it was expected that the type of defensive behavior would vary with the amount of escape room. The defensive behavior obtained can be classified as follows, in order of amount of activity: (a) fighting back, (b) running away, (c) defensive posture (standing on hind legs and holding front legs out toward aggressor) plus tail rattling, (d) defensive posture, squeaking when attacked and (e) lying on back with feet in air, squeaking when attacked. Types (b) and (d) were most commonly observed. Under these conditions the two interacting factors which appeared to determine the type of defensive reaction were (1) space and (2) severity and suddenness of the attack: (1) running away was associated with the large multiple escape pen, whereas the defensive posture was associated with the small pen. Lying on the back occurred when the mouse was caught in the end of a blind passage. (2) When the attack by the aggressor was sudden and severe, the attacked mouse did not fight back and might not be able to escape by running and so assume the defensive posture even in the large pen. — All types of behavior appeared to be adaptive, with the possible exception of squeaking. It is concluded that the behavior resulting from spatial restriction of defensive movements of untrained mice is in general adaptive.

The development of the gonads of the albino rat. THEODORE W. TORREY, Indiana University.—A gonadal blastema is established through the combined proliferative activities of a morphologically continuous coelomic epithelium and deeper mesenchyme. Ovarian differentiation begins on the 16th day with the appearance within the blastema of primary cords. There is no tunica between the cords and the epithelium. The primary cords either abut directly against the epithelium or are continuous with it. The epithelium in turn differentiates into superficial and basal layers, the latter, then, commonly being continuous with the cords beneath. Secondary cords originate in the basal epithelium, but are continuous with and thus not easily distinguished from the primary cords. Testes differentiate towards the end of the thirteenth day. Primary cords arise directly out of the gonadal blastema and an area of undifferentiated cells, potential tunica, intervenes between the cords and

coelomic epithelium. The subsequent history of the primary cords, germ cells, tunica, and interstitial cells parallels that for mammals in general. All are traced to the original blastema. The coelomic epithelium of the testis fails to differentiate into two layers as it does in the ovary. Further, no secondary cords are produced. A slightly greater thickness of the epithelium on the ventral surface of the testis is the only indication of a potential second generation of cords. These observations are discussed in terms of the general question of sex reversal.

Some birds of Indiana. HOWARD H. VOGEL, JR., Wabash College.—This 16 mm. kodachrome motion picture film shows a number of our Indiana birds in color. Efforts were made to secure pictures of characteristic behavior, especially different nesting habits, methods of feeding, types of flight, and the hatching process. A series of motion pictures show a roost of the Turkey Vulture near the "Shades" at Waveland, Indiana. These pictures emphasize the roosting habitat, the soaring flight of the birds, and their method of keeping their balance in the tops of dead trees. Another group of pictures shows a heron rookery at Mace, Indiana. Characteristic behavior is shown by our largest heron, the Great Blue Heron. Nesting is photographed in several other species, including the Mourning Dove, Red-winged Blackbird, Catbird, Ruby-throated Hummingbird, House Wren, Bluebird, Flicker, Wood Thrush, and Chipping Sparrow.

A series of time lapse photographs show the hatching process in the eggs of the Bobwhite Quail. Other pictures show characteristics of immature birds. Several different methods of feeding are also shown in these films, especially of the Mallard Duck and the Horned Lark.