

ZOOLOGY

Chairman: C. P. HICKMAN, DePauw University

About 75 persons were present during all or a part of the session of the section on zoology. Sixteen papers were presented. An outstanding one of these, as indicated by interest and discussion, was that by W. A. Hiestand, Helen J. Ramsey, and Doris M. Hale on the physiological effects of cigarette smoking.

W. A. Hiestand, Purdue University, was elected chairman of the section for 1940.

ABSTRACTS

The effects of cigarette smoking on metabolic rate, heart rate, oxygen pulse, and breathing rate. W. A. HIESTAND, HELEN J. RAMSEY, and DORIS M. HALE, Purdue University.—To determine the effects of smoking on various functions, 39 subjects of both sexes, some confirmed smokers and some light smokers, were used in a non-basal metabolic state. A half-hour rest period was allowed before the test, but no precautions were taken to secure post-absorptive repose. A second series was undertaken with 20 habitual smokers in a basal condition of post-absorptive repose. Determinations were made for each individual at 15-minute periods following smoking to determine the durability of the effects. The non-basal subjects showed considerable individual variability, marked increases and decreases being noted in each function. The average increase in metabolic rate was 7.7% in men and 9.9% in women; the average increase in heart rate was 5.9% in men and 6.4% in women. In the basal subjects the metabolic rate rose 14.3% immediately after smoking, then fell slightly and rose again; the duration of the effect beyond 45 minutes after smoking was not determined. The heart rate rose 16.7% immediately after smoking, quickly fell to slightly above normal, and was 2.6% below normal at the end of the experiment. The oxygen pulse first dropped to 2.1% below normal and then continued to rise, reaching 11% at the end of the experiment. The breathing rate first fell to 7.4% below normal and then rose to 1.1% below normal at the end of the period. The behavior of the oxygen pulse indicates an immediate decrease in the adaptability of the heart with a gradual recovery.

The life cycle of *Monorcheides cumingiae* (Martin) (Monorchidae, Trematoda). W. E. MARTIN, DePauw University.—The life cycle of *Monorcheides cumingiae* involves the development of the larval stages in the marine clam, *Cumingia tellinoides*, and the maturation experimentally in the flounder and eel. The anatomy, effect on the clam, and the ecological relationships of the parasite are considered.

A note on the occurrence of a syrphid larva as an accidental parasite of man. HELEN L. WARD, Purdue University.—A parasite from the intestine of a woman from Oaktown, Indiana, has been identified as the larva of a syrphid fly, possibly *Eristalis tenax* (Linn). The single speci-

men was sent to Dr. H. E. Enders by Prof. Beghtel of Evansville College and referred to the writer for study. The larvae of syrphid flies have been reported from time to time as human parasites. Their presence in the intestine is due to accidental ingestion of the eggs or larvae in water or food. The symptoms which have been described are nervousness, indigestion, headache, and emaciation.

Panting and temperature regulation in the chicken. W. C. RANDALL and W. A. HIESTAND, Purdue University.—Panting in the chicken as a response to rising body temperature was demonstrated in this investigation. That panting is regulated by a center separate from the respiratory center is indicated by the use of centrally acting drugs. Reflex inhibition of panting following external chilling invariably occurred even though no appreciable drop in internal temperature was noted. Above a certain upper critical temperature level the panting mechanism begins to fail, resulting in a reduced rate. Central depression reduces panting rate, and deep anesthesia abolishes it entirely, light anesthesia raising the panting temperature. Depressant drugs affect the panting center independently of the respiratory center. Central stimulation (lobeline) results in increased panting and respiratory movements followed by a longer period of increased sensitization of the panting mechanism. This sensitization is apparent in a lowered panting threshold, an increase in panting rate in relation to internal temperature, and a greater maximal panting rate.

Egg production in trematodes with special reference to *Spelotrema nicolli* (Microphallidae). R. M. CABLE, Purdue University.—In studying the life history of *Spelotrema nicolli*, egg formation has been observed repeatedly. The oocyte, separating gradually from the ovarian mass while the preceding egg is formed, is propelled down the oviduct and passes into the ovijector which contracts instantly, forcibly expelling the oocyte into the ootype. This produces an enlargement of the beginning of the ootype where currents produced by long cilia rotate the oocyte rapidly for a few moments, facilitating fertilization. The zygote, forced along the ootype by a series of contractions until it reaches the opening of the vitelline reservoir, pauses there and is provided with a mass of vitelline material which is squeezed into the ootype by a series of contractions of the vitelline reservoir. Excess vitelline material and occasional sperms are voided through Laurer's Canal. The zygote surrounded by this material then passes just beyond the openings of the shell gland into the egg chamber, the muscular walls of which mold the egg as the shell material hardens. The egg is kept in constant motion by contractions of the egg chamber and may be turned end for end several times before the shell is completed. A much stronger contraction now begins back of the finished egg and ejects it into the uterus; at the same moment another oocyte moves down the oviduct, and the process is repeated. In one instance, it was noted that 24 minutes elapsed between the descent of one oocyte and that of the succeeding one. At the relatively high body temperature of the host, however, egg formation must proceed much more rapidly than

observed at room temperature, as indicated by the number of eggs present in young worms.

Notes on *Miranda aurantia*. FRANCIS WENNINGER, University of Notre Dame.—*Miranda aurantia* is the name that should be used although at least 28 writers mention neither the genus nor the species. The peculiar position of the eyes, some prominences, and other internal features, mating and egg-laying, and the disposition of the nest are noted.

Preliminary limnological survey of Dewart Lake, Kosciusko County, Indiana. MURVEL R. GARNER, MARKLAND MORRIS, and GLEN WOOD, Earlham College.—A preliminary limnological survey of Dewart Lake was made during the summer of 1939 with a view to making a continuous comparative study through a period of years. The usual limnological data with respect to physical, chemical, and biotic determinations were taken. The lake, which lies between Tippecanoe and Wawasee, is a relatively small one and has large areas of shallow water. The significance of the ratio of shallow water and deep water is being studied from the standpoint of biotic productivity in order to make comparisons with some of the nearby larger lakes. The significance of an artificial raising of the level of the lake many years ago by a low dam is also under study. Preliminary reports on data obtained are tabulated.

ⁱ **Insects of Indiana for 1939.** J. J. DAVIS, Purdue University.—This paper is a discussion of the major insect problems in Indiana during the past year, with explanation of causes of insect abundance or scarcity, and new developments in insect control.

Records of Indiana dragonflies, X. 1937-1939. B. ELWOOD MONTGOMERY, Purdue University.—New county, seasonal, and other records of Odonata, based upon collections of 266 specimens (29 species), 414 specimens (49 species), and 1455 specimens (54 species) made in Indiana in 1937, 1938, and 1939, respectively, are listed. Observations showing the establishment of *Celithemis fasciata* Kirby, a southern species, at a lake near Oakland City, are noted. Ecological notes and discussions of variations observed in certain species are given.