

## ZOOLOGY

Chairman: ROBERT H. COOPER, Ball State Teachers' College  
WILLIAM EEBERLY, Manchester College, was elected chairman for 1965

### ABSTRACTS

**Birds Eggs in the Gorby Collection.** J. HILL HAMON, Indiana State College.—Indiana State College recently acquired the Gorby Collection, a large natural collection, from Franklin College, Indiana. It was assembled by S. S. Gorby who was State Geologist of Indiana from 1889-1894. Included in the collection is an outstanding assemblage of invertebrate fossils including a number of type specimens, a large number of invertebrate neospecies, and a small cabinet of bird eggs. Nineteen orders of birds are represented by 758 eggs of 366 species. Items of particular interest include eggs of the passenger pigeon, *Ectopistes migratorius*, the whooping crane, *Grus americana*, and a number of European species. There are no data recorded on this collection.

**Minimum Numbers of Histocompatibility Factors Among *Eurycea bislineata* and *Eurycea lucifuga*.**<sup>1</sup> JOHN T. BURNS, Wabash College.—One variant histocompatibility factor between two individuals is enough to lead to rejection of the skin of the individual with the factor by the one lacking it. On the assumption that salamanders occupying limited areas of a stream or those associated with caves might be relatively closely related, skin grafts were made among all members of sets of *Eurycea bislineata* and of *Eurycea lucifuga*, the latter of which frequent caves, to see if any two or more animals possessed a genetic identity which would allow for graft acceptance. Thirty *E. bislineata* (n) were collected within a 27 m length of stream and were multiply grafted until each animal had been challenged by the skin of every other animal (n-1). In all, 870 homografts, 30 (n-1), plus 30 autografts were planted but only the autografts were accepted. Theoretically by excluding homozygotes and assuming a single histocompatibility locus, one could account for the mutual rejections among animals sharing a minimum of 9 multiple alleles. The selecting procedure favors homogeneity rather than heterogeneity and also favors relatively frequent expression of homozygosity. Thus, in view of the size of the sample and the number of grafts, the data strongly suggest that in *E. bislineata* the minimum number of factors is greater than nine. Samples of *E. lucifuga* are smaller but the pattern of rejection is the same as for *E. bislineata*, there being minimal values of 5 factors for 7 animals from May's Cave and 6 factors for 11 animals from Ray's Cave. It would seem that conditions which might have allowed for selection have not operated insofar as histocompatibility genes are concerned.

**Distribution of Opposing Valves of *Dinocardium robustum* (Molusca) on a Texas Beach.** CHARLES D. WISE, Ball State Teachers College, and LOUIS S. KORNIKER, U. S. National Museum.—Deposits of clam

1. Supported by NSF GE 1916 (URPP) and NIH GM 05619 to L. E. DeLanney.

shells on recent beaches, as well as in ancient sediments in the fossil record, often exhibit an excess of left over right valves or right over left valves. The occurrence is sometimes referred to as the left-right phenomenon. In an attempt to determine factors influencing this phenomenon, valves of *Dinocardium robustum* were collected from the beach at Port Aransas, Texas through a period of 21 months. The differences in numbers of opposing valves were found to be significant for some of the months. Furthermore, for these same months, it was found that averages of valve length were greater than for those months without significant differences in numbers of opposing valves, suggesting a high energy surf requirement for separating opposing valves. Differences between opposing valves in weight, ornamentation, and fragility seemed not to be important factors in differences in their distribution. A definite seasonal pattern in occurrence of significant differences in number of opposing valves was not revealed by the study. Incidentally, it was found that boring snails attack left and right valves in equal numbers and seem to favor clams of small size.

**New Findings for the Protozoan *Halteria grandinella*.** HENRY TAMAR, Indiana State College.—Little research has been done on *Halteria grandinella* because of lack of an adequate culture method. A satisfactory culture method based on the house fly (*Musca domestica*) has now been devised. *Halteria grandinella* grown by this method were found to have a structure different in major features from that previously described. Earlier researchers are also in disagreement about major structural features of this species, and it thus appears possible that there may be varieties of *H. grandinella*. The locomotion of *H. grandinella* was also investigated, and a new escape movement, named rapid backward spiraling, was discovered. *H. grandinella* which swim into the surface of the liquid containing them burst there, probably because of the high energy present at a liquid surface (surface tension).

**Tropical Medicine in the Caribbean—a Training Program of Great Value to Teacher of Parasitology.** KENNETH D. BURNHAM, Ball State University—The Inter-American Fellowship Program, administered by Louisiana State University School of Medicine and financed by the National Institutes of Health, affords teachers of parasitology, bacteriology, and allied fields valuable and current information on diseases and health conditions in Latin America. The opportunity to meet with Latin-Americans engaged in parasitological research, access to acquire instructional materials, and some insight into problems of tropical medicine are also provided. Small groups are sent, at various times during the year, to either the Caribbean area (Puerto Rico, Trinidad, Venezuela, and Columbia) or to Mexico and Central America. The duration of the program is approximately ten weeks and *per diem* support and travel arrangements are provided. Some aspects of the conditions encountered in the Caribbean area and of the types of health problems likely to be found were described utilizing  $2 \times 2$  colored slides.

**Effect of Handling and of Pre-training of Chicks on a Subsequent Learning Task in the T-maze.** W. C. GUNTHER, Valparaiso University.—Chicks hatched from eggs incubated at normal temperature were variously handled and pre-trained in a T-maze. Handling was accomplished by simply picking up each chick and returning it to its brooder at least once a day. The pre-training consisted of placing the chicks singly in a T-maze for varying lengths of time, from one minute to 20 minutes. Food was available at all times in both arms of the maze. After the training period the chicks were run for 22 trials in the maze, having to learn to find the correct food-well placed in one arm of the maze. The time in seconds that it took the chicks to find the correct food-well was used as a criterion of performance. When compared with unhandled and untrained birds, the handled and pre-trained chicks performed significantly better by groups: the latter also learned at a significantly faster rate. The optimal pre-training period under these conditions was found to be 10 minutes.

**Soluble and Membrane-bound Trehalases in Insects.**<sup>1</sup> ARNOLD E. S. GUSSIN and G. R. WYATT, Butler University and Yale University.—*Cecropia* flight muscle was homogenized in ice-cold polyvinylpyrrolidone containing 1mM EDTA and fractionated in the centrifuge; fractions were assayed for trehalase activity by a modification of the glucose oxidase technique. The specific activity of the enzyme was greater in the high speed fraction (105,000xg, 60 min) than in any other fraction. No activity was noted in the soluble supernatant. A similar experiment on larval midgut showed that trehalase was most active in the high speed fraction; in this experiment, however, the supernatant also exhibited some activity.

The particulate flight muscle enzyme exhibited a pH optimum at 6.8 and a Km value of  $3.6 \times 10^{-3}$ M, while the corresponding values for the particulate larval midgut trehalase were 6.8 and  $2.9 \times 10^{-3}$ M. The soluble form of the midgut enzyme, on the other hand had a pH optimum of 5.8 and a Km of  $3.6 \times 10^{-4}$ M. These latter values are similar to those obtained by several other workers for the soluble enzyme derived from whole insects. These workers were probably not aware of the existence of a particulate trehalase.

The particulate flight muscle enzyme was localized in the high speed or "sarcotubular" fraction of the cell. Cytochrome c oxidase assays showed this fraction to be virtually free of sarcosomes. Also, electron micrographs of the fraction illustrated that it was composed of small vesicles, tubules and particles, but that fibrils and sarcosomes were absent.

**Current Taxonomic Status of the Blind Snakes, Families Typhlopidae and Leptotyphlopidae.** JAMES C. LIST, Ball State Teachers College.—The six genera and 250 species of Blind Snakes have classically been arranged in two families. A proposal to erect a third family for one of the genera has met with various reactions. A more

<sup>1</sup>Supported by grant AI-01028 from the U.S.P.H.S. and a Postdoctoral Fellowship (A.E.S.G.).

recent proposal that the Typhlopidae be removed entirely from the suborder Ophidia has likewise been variously received.

A study of the skeletal anatomy of 33 species of the Blind Snakes leads me to (1) support the establishment of a third family, but to include four genera, (2) urge that the Blind Snakes be retained in the Ophidia, and (3) suggest changes in the interpretation of certain skeletal homologues.

**The Follicle Stimulating Hormone Content of Chicken Anterior Pituitary Glands.** FRANK J. ZELLER, Indiana University.—Evaluation of the anterior pituitary gonadotropins of laboratory and domestic animals has been the object of a large number of investigations. In mammals, particularly in the rat and mouse, the studies have become quite specific in attempting to distinguish between the content of the follicle stimulating hormone (FSH) and the luteinizing hormone under varying conditions. Recently, several studies have been made on the gonadotropic content of chicken pituitary glands utilizing newly hatched chicks as the assay animals. These assays, based upon increased testis weight or  $P^{32}$  uptake, measured total gonadotropin. The purpose of this report was to present a preliminary study on the use of the Steelman-Pohley assay method of determining specifically the FSH content of White Leghorn pituitary glands over a period of two hundred days. It was noted that from day 20 to day 100 the anterior pituitary glands of capons generally had a higher FSH content than did those of unoperated controls; but after this the control glands contained comparatively more FSH. In another observation, testosterone propionate was shown to increase the FSH content of capon pituitary glands.

**Metamorphic Stasis in the Larval Amphibian after Cold Exposure.** W. ANN REYNOLDS, Ball State Teachers College.—After exposure to 4°C for 7 or more days, metamorphic progress and growth were inhibited after rewarming in certain *Rana pipiens* larvae. Both normal animals and those treated with 1-thyroxine prior to and/or during cold exposure entered into stasis after rewarming. The observed stasis was terminated by thyroxine administration resulting in eventual completion of metamorphosis implying that the thyroid-pituitary axis is being affected by cold rather than individual tissues. Metamorphic stasis was reversed spontaneously in some instances and entirely failed to occur in approximately one-fourth of the cases which continued to metamorphose normally after rewarming. Certain animals treated with thyroxine in the cold bath, while failing to demonstrate any metamorphic advance at that temperature, metamorphosed precociously upon rewarming although no further hormone was administered suggesting that the hormone is being retained by the tissues.

Pituitary glands were removed from normally metamorphosing tadpoles and implanted behind the right eye in tadpoles whose metamorphosis had been inhibited by prior cold exposure. The majority of the pituitary recipients then began to metamorphose immediately and completed the process successfully, indicating that the animal's own

pituitary gland had been altered by cold exposure but that the thyroid gland was still capable of apparently normal function. (Supported by grant GM-10295 from the U.S.P.H.S.)

**A Preliminary Study of the Littoral Fish Populations in a Northern Indiana Lake.** CHARLES O. HATCHER and JAMES R. GAMMON, Earlham College and DePauw University.—A fourteen foot seine with a four centimeter mesh was utilized to seine two areas of the littoral zone of Dewart lake in north central Indiana. Areas were seined on alternate days beginning July 11, 1964 and ending July 24, 1964. *Labidesthes sicculus*, the northern brook silversides, outnumbered the total *Cyprinidae* 25:1 in the seine's catch. Young-of-the-year *L. sicculus* outnumbered one year and older *L. sicculus* 400:1. Largest young-of-the-year *L. sicculus* growth increment over a ten day period was one centimeter. Diurnal migration was studied and it was found that young of the year *L. sicculus* move in and out of the seining area in relation to light intensity and temperature. An increase of predator fish in the seining area at night is followed by a subsequent drop in the population of young of the year *L. sicculus*. The two seining areas yielded 2,750 *L. sicculus*, the population recovering from the seining pressure every 5 days. The population density of *L. sicculus* was found to be on the average of 1.2 fish per cubic meter.