

ZOOLOGY

Chairman: L. E. DELANNEY, Wabash College

JAMES B. COPE, Earlham College, was elected chairman for 1962

ABSTRACTS

Further Studies on the Infection of *Paramecium* by Kappa.¹ JO ANNE MUELLER, Indiana University. — *Paramecium aurelia* includes strains known as killers which release a particulate toxin capable of killing sensitive strains. The production of toxin is associated with the presence of genically supported cytoplasmic particles known as kappa. The contents of stock 51 killers, syngen 4, contain material that can cause stock 51 sensitive animals to become infected and subsequently develop into killer cultures (Sonneborn, 1948). Two components from the killers are required for successful infection. Disrupted killer animals centrifuged at 25,000 x G for 5 minutes results in the separation of the two components. The centrifugate contains infective kappa particles and the supernatant contains a co-factor (Tallan, 1959). The following experiments investigate conditions conducive to enhanced infectivity of sensitive animals. The sensitive animals used for the detection of infective particles vary in their response to the infective mixture. If the detectors are grown, previous to exposure, in a medium buffered with CaCO_3 and Ca(OH)_2 they are much less susceptible to invasion by infective particles than if they are grown in the same type of medium but with a sodium phosphate buffering system. In the former, vast quantities of kappa particles are required to insure infection, a thousand-fold increase to that required when the sensitive detectors have been grown with the phosphate buffering system.

The Axial Skeleton of the Pygmy Sunfish (*Elassoma*).² ROLLIANA A. BINDER and CLARENCE F. DINEEN, Saint Mary's College, Notre Dame.—The Pygmy Sunfish, *Elassoma*, has been reclassified from a single genus family, Elassomidae, to the family Centrarchidae (sunfish) where it had originally been placed. These classifications have all been based on external characteristics. In order to gain additional evidence for proper classification, the axial skeletons of 19 specimens (two species) were cleared and stained for bone. Individual bones were compared chiefly with those of *Archoplites interruptus* as a representative of the Centrarchids. The major differences were the absence of interneurals, the fusion of the hypurals of the caudal fin, modifications of the ultimate vertebra, greater constriction of the centra and unique modification of the anterior abdominal haemal spines. As evidenced by the axial skeleton, the *Elassoma* is less closely related to the *Archoplites interruptus* than is the latter to the other Centrarchid fishes.

The Pleistocene Passeriform Avifauna of Reddick, Florida. J. HILL HAMON, Indiana State College.—The fossil-beds of Reddick, Florida are

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the richest Pleistocene deposits in eastern North America. They bear a tremendous vertebrate fauna including 60 species of mammals, 63 species of birds, and 50 species of amphibians and reptiles. The passeriform avifauna is the richest in North America and is composed of 26 species, four of which are extinct. The deposit is the filling of a former large cave. The bone-bed is of fresh water origin and is thought to have been deposited during the Illinoian glacial stage. This age assignment is corroborated by extinction ratios and by stratigraphic evidence. The avifauna has some members with boreal and some with Sonoran affinities. Parallel faunal origins exist among the mammals. The climate during the time of deposition of bone-beds is thought to have been about 6° F. cooler in summer, and about 7° F. cooler in winter.

Horizontal Distribution of Cladocera Remains in Surficial Sediments of Indiana Lakes. WAYNE P. MUELLER, Indiana University.—An examination of lake sediment reveals an abundance of chitinous exuviae of Cladocera which are identifiable to species. These remains are found distributed over the entire lake bottom and can broadly be divided as those derived from the littoral zone inhabitants—principally the Family Chydoridae; and the planktonic inhabitants consisting mainly of *Daphnia* and *Bosmina*. Due to these habitat differences and the movement of remains after molting, a non-uniform distribution is found in the surficial sediments. To investigate the distribution of remains over the lake bottom, dredge hauls of sediment were taken along transects in three Northern Indiana glacial lakes. Qualitative and quantitative examinations reveal a uniform distribution of species over the lake bottom and a pronounced decrease in littoral remains as deep water is approached. Total remains per gram dry weight of sediment increases with depth although the maximum value is usually found before maximum depth is reached. A sediment collector was placed in Winona Lake to determine when redeposition of littoral remains into deep water locations occurs. Available data suggest a continuous removal of littoral remains during thermal stratification due to the overlying epilimnetic water. At fall overturn a six to seven fold increase of total remains was observed but at this time deep water sediment enters the circulating water column.

The Identification and Significance of *Bosmina* (Crustacea, Cladocera) Remains in Lake Sediments. CLYDE E. GOULDEN, Indiana University.—Because of the great variability in the genus *Bosmina*, much confusion has existed in delimitation of species. At one time over nine species were recognized in Europe, but now only two species are recognized, *Bosmina longirostris* and *B. coregoni* based on Burckhardt's description of the postabdominal claws. This problem is important to the study of lake ontogeny because *Bosmina* exuviae compose over 50% of the cladoceran remains in many lake sediments, and because *B. coregoni* tends to be more closely associated with oligotrophic lakes. Postabdominal claws are very scarce as compared to head shields and shells in lake sediments and hence of limited use for identification of species. In a study of sediments from Esthwaite Water in England, a method for the identification of head shields by use of lateral head pores has been discovered. This method is apparently usable in living forms as well as fossil material and thus is of some taxonomic as well as paleolimnological importance.

Defensive Actions of Newly-hatched Hog-nosed Snakes (*Heterodon platyrhinos*). WILLIAM B. HOPP and J. HILL HAMON, Indiana State College.—Five of a clutch of eight eggs laid by a captive female *Heterodon platyrhinos* on July 10, 1961, hatched on September 8, 1961. When first observed, four had just emerged and the fifth was still partially within the egg shell. Upon the slightest disturbance, all feigned death immediately, without first going into the threatening activities frequently observed in older specimens.

Some Observations on Energy Balance in *Dolichonyx oryzivorus*, During Premigratory Fat Deposition. CAMERON E. GIFFORD, Earlham College.—Energy balance has been determined for twenty Bobolinks kept under laboratory photoperiodic stimulation for a period of a year. Under non-migratory conditions the bobolink requires 13-16 Kcal/bird/24hr., whereas the same bird during the premigratory period of fat deposition requires 30-35 Kcal/bird/24hr. Premigratory fat deposition or positive energy balance in the bobolink is brought on by the increase of gross energy input or hyperphagia.

Local Movements of Some Indiana Bats. JAMES B. COPE, Earlham College.—Data on migrating bats was obtained by mist netting in front of caves for three years during the spring and fall. Shifting of bats from one colony to another, both in summer and winter, has definitely been established. Movements of *Myotis lucifugus*, little brown bat, from winter quarters to summer quarters and from summer quarters to winter quarters, are reported for the first time.

Effects of Environmental Factors on Populations of Ostracods. CHARLES D. WISE, Ball State Teachers College, and LOUIS S. KORNIKER, A. and M. College of Texas.—Few data from laboratory experiments on ostracods have been recorded in the literature, but preliminary experiments indicate that laboratory cultivation and experimentation can be extremely useful in solving problems concerning the effects of environmental factors on the distribution of ostracods. A most promising technique is culturing ostracods under controlled laboratory conditions and determining the manner in which specific environmental variables affect the population. In this way, it was shown in the laboratory that ostracods varied in size when grown under different ecological conditions, *e. g.*, ostracods cultured in the absence of light were smaller than those cultured in the light, and those cultured at lower temperatures were larger than those cultured at higher temperatures. A species of fresh-water ostracod cultured in the laboratory was found to be smaller at maturity than specimens of the same ostracod collected from nature. The fresh-water ostracod species studied did not develop in laboratory cultures when the temperature was kept continuously at 37 deg. C., but did develop when the temperature varied diurnally between 30 deg. C. and 40 deg. C., a condition approaching that found in nature. At temperatures used, *Cyprinotus dentatus* was found to develop best at 25 deg. C. Experiments performed on the marine ostracod, *Hemicythere conradi*, showed that specimens acclimated at 25 deg. C. could not survive temperatures above 36 deg. C. nor below 6 deg. C. This species of ostracod exhibited positive phototropism and preferred silty sand to oolitic sand when given free choice in the laboratory.