

ZOOLOGY

Chairman: C. J. GOODNIGHT, Purdue University

F. R. Elliott, Valparaiso University, was elected chairman for 1952

ABSTRACTS

Preliminary laboratory report concerning the effect of colchicine on development in *Drosophila melanogaster*. R. L. BELL, Purdue University.—An attempt was made to duplicate the tetraploid character produced by the colchicine-treatment of plants in *Drosophila melanogaster*. The *Drosophila* were treated by adding the colchicine (in a solution) to the culture media. No macroscopic evidences of tetraploid individuals were apparent. A concentration of active ingredients in the order of one part/million parts of media was sufficiently toxic to prevent the development of an adult F_3 generation. Toxicity was found to be a function of both concentration and the stage of the individual's development.

Geographical distribution of the land snails of Indiana. CLINTON J. BUSHEY, Taylor University, Upland, Indiana.—Very little work has been done on the geographical distribution of land snails in Indiana. Collections have been somewhat concentrated in a few locations but this has been more or less by chance. Dr. Call, in 1900, presented a comprehensive list from the state with descriptions. Cohn and Kemp in 1929 published a paper on the land snails found in Turkey Run State Park. Goodrich and Van der Schalie put out in 1944 a revision of the Mollusca of Indiana. Dr. Pillsbry in his great Monograph on the Land Snails of North America includes many snails from Indiana, but none of these make any determined attempt to locate where in Indiana these snails are found.

The project in mind is to collect from as many sections of the state as possible and make the record available. All available literature is being studied as possible sources. The author is anxious to supplement from any source possible and would appreciate receiving land snails from anybody in the state. Include location data when forwarding specimens.

Methods for the quantitative estimation of cell densities in sectioned tissues. D. T. CHALKLEY, University of Notre Dame.—Cell and nuclear densities determined by the usual grid method are subject to increasing error as the cell diameter/section thickness ratio increases. This error can be reduced for tissues with nuclei lying parallel to the section plane by using a grid whose parallels are separated by an

interval equal to the section thickness. The nuclear density d is found by:

$$d = (d_o^3 \times d_n^2)^{1/5}$$

Where d_o is the number of nuclei lying within the grid limits and d_n is the number of these nuclei which do not cross the grid parallels. In epithelia the area a covered by the average cell can be approximated from the formula:

$$a = \frac{180}{4nc^2 \tan n} \pi^2$$

Where n is the average number of cells in contact with a given cell and c is the mean chord of the cell cross section in a plane parallel to an epithelial surface. Densities are computed for unit area of the cross section plane.

A technique for growing hydroids in the laboratory. SEARS CROWELL, Indiana University.—A small piece of a hydroid colony is tied by a thread to a glass slide. Growing stolons attach to the slide and the thread is removed. Slides are kept in well oxygenated, cool, moving water. Specimens are fed once or twice a day with newly hatched brine shrimp (*Artemia*). Under these conditions growth is rapid, specimens appear healthy, and observations can be made easily. The method has been used for the fresh water hydroid *Cordylophora*, and for *Hydractinia*, *Podocoryne*, and *Campanularia*. —Demonstration.

Food-web dynamics in a pond. CLARENCE F. DINEEN, Notre Dame University.—A small pond located in Ramsey County, Minnesota was studied for two years. Physical records, chemical analyses, and quantitative collections of planktonic and benthic organisms were made weekly except during the winter. The annual production of the higher aquatic plants was determined.

The trophic relationships of the organisms in the pond community formed a complex food web. The organisms were separated into the following major food groups: 1) phytoplankters; 2) zooplankters; 3) browsers; 4) predators on the plankton; 5) benthic predators; 6) swimming predators; 7) filamentous algae, duckweed, and pondweed. The ash-free dry weight of each food group was determined. The dry weights were converted to calorific values.

The food groups formed three trophic levels; namely: the producers (chlorophyll-bearing plants), primary consumers, and secondary consumers. The productivity and the biological efficiency of the three trophic levels were determined. The biological efficiency increased from the producer level to the top consumer level while the rate of production decreased from the producer level to the top consumer level.

The action of x-rays on mitotic activity and leucocyte infiltration in regenerating urodele limbs. WALTER J. FIMIAN, JR., University of Notre Dame.—Forelimbs of the adult newt fail to regenerate after exposure to

x-ray doses of the order of 15,000 r. Comparisons of the patterns of distribution of mitoses in normal and partially irradiated limbs indicate that the initial burst of mitotic activity in the connective tissues of the stump is markedly suppressed in the irradiated areas. Suppression of mitotic activity in the epidermal tissues is only temporary. The number of leucocytes present in the irradiated limbs is much lower than in the controls.

The origin of the Phalangodidae (Phalangida) of the United States. CLARENCE J. GOODNIGHT, Purdue University.—Phalangodids are small tropical phalangids that are world wide in distribution. In the United States, they are limited to the southern states although one species extends as far north as Southern Indiana and Ohio. From the structure and distribution of them, it is apparent that North American species are derived from the Mexican forms. Their invasion into more northern areas must have been at a comparatively recent date as evidenced by the paucity of species and the restricted localities in which they live. From a study of species, it is probable that the Ozark plateau and the Appalachian highlands were secondary centers of differentiation and distribution of forms. Another group of Phalangodid species migrated to the west and are now found in Texas, Arizona, and on the west coast. Still another genus in this large family is found in southern Florida. The species here is a very recent invader from Cuba. So recent is its invasion that it is only subspecifically different from the Cuban form.

Oxygen consumption and development of *Stagnicola reflexa*. P. LEONARD KNIGHT, JR., University of Notre Dame.—The time for the complete embryonic development of the snail, *Stagnicola reflexa* (Say, 1821) has been determined as 223.5 ± 4 hours at temperatures ranging between 18 and 21°C.

The eggs are deposited in capsules, which in turn are surrounded by a gelatinous matrix. The capsules in a single clutch have been found to vary in length and width. The volume of the clutch depends on at least three factors 1) age, 2) number of capsules and 3) size.

Warburg respirometers, maintained at 25°C., have been used to determine the oxygen consumption of ten stages (single cell to and including the pre-hatch). A linear rate of increase in the amount of oxygen consumed has been observed after 68 hours of development. The total amount of oxygen consumed by a single embryo during its development has been determined to be 8.9933 C.mm. (approx.). It is believed that ciliary activity and muscular movement have a significant effect upon the amount of oxygen consumed by the various stages.

The problem of pH change in the Warburg apparatus. LAWRENCE H. MONACO, University of Notre Dame.—Failure to consider loss of KOH by possible diffusion through surface films in the center well of the conventional Warburg Constant Volume respirometer flask has made the accuracy of much of the previous research questionable. Exhaustive tests in our laboratory have shown that "creeping" or splash-

ing of alkali from the center well into the experimental fluid occurs despite recommended precautions as to center well volume, the use of "KOH papers", greasing the center well rim, and shaking speeds and amplitudes.

Using two drops of phenolphthalein in 3 cc. of distilled water as the experimental fluid, the following methods were used in an attempt to eliminate the error due to KOH splashing: (1) adding a known volume of 10% KOH, ranging from 0.2 ml. to 0.6 ml., to the center well; (2) greasing the top of the center well with various commercial greases; (3) placing a few strips of filter paper in the center well; and (4) controlling the speed and amplitude of shaking after attaching the manometer. It was found that in spite of all these precautionary measures a pH change occurred as registered by the indicator.

Further work in this regard by using various ion exchangers in place of KOH is in progress.

The mental gland of *Plethodon glutinosus*. ALBERT E. REYNOLDS, DePauw University.—In adult males of the salamander *Plethodon glutinosus* the skin of the lower jaw exhibits a small circular area of thickened and relatively less pigmented skin which constitutes a "chin button" or "mental gland" that has been interpreted as being hedonic in function. In this paper a preliminary account of the histology and size relations of the gland is given.

A snail shell with a double peristome. ARTHUR L. SCHIPPER, University of Notre Dame.—A specimen of *Stagnicola reflexa* (Say) has been found, the shell of which possesses a double peristome. Extension of the original peristome was discontinued and a new peristome has been formed, the attachment being inside the older peristome. The newer portion of the shell is in contact with the older portion only at the point of original attachment and along the parietal wall of the aperture. Extension of the newer portion of the shell has placed the second peristome beyond the point reached by the first.