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FOURTEENTH ANNUAL MEETING OF THE COLLEGIATE DIVISION TENNESSEE ACADEMY OF SCIENCE

SATURDAY, NOVEMBER 30, 9:00 AM
ROOM 407, HUNTER HALL
UNIVERSITY OF CHATTANOOGA
Don P. Claypool, Sponsor
GENERAL SESSION
President James G. Karah, Chairman

Isomerization and Disproportionation of the Xylenes Using a Friedel-Crafts Type Catalyst in Nitromethane. Guilford Jones and Charles L. Calhoun, Southwestern at Memphis.

The effect of the amount of hydrogen bromide catalyst on the Friedel-Crafts isomerization rate of alkybenzenes such as xylene was studied, but no conclusions were drawn from the kinetic data. Gas chromatography with modified Bentone-34 packing was used to analyze the isomeric xylene mixtures. Nitromethane as solvent to make the reaction mixture homogenous acted as a negative catalyst. Nitromethane also shifted the equilibrium concentration of meta-xylene from 71 plus or minus 2% to 42 plus or minus 2%. With nitromethane present, para-xylene proved most reactive, meta-xylene least reactive, and ortho-xylene intermediate. Toluene and tri-and tetramethyl benzene disproportionation occurred, but only where para-xylene constituted the starting mixture or was produced by isomerization. Data was inconclusive to predict a mechanism, but supported the theory of alkyl group shift on the ring.

The Effect of Ultraviolet Light on the Length of the Embryonic Period in the Parasitic Wasp Habrobracon juglandis. James H. Fall, Southwestern at Memphis.*

The typical hatching time at 30°C in *Habrobracon* is 29 (±1) hours after oviposition. Embryos representing three different ages during this period were chosen for experimentation. The eggs, after being collected from virgin females and allowed to develop to the proper age (3, 12, or 23 hours), were subjected on their concave surfaces to LD50 dosages of UV (2537 A). Observations were made at one hour intervals between 29 and 37 hours of development to determine the time at which hatching occurred. Hatchability was used as the major criterion to verify and quantify the degree of variation from the typical hatching time and an attempt was made to correlate the results with the developmental events occurring at the ages studied. In general, UV decreased the rate of development with those at 12 hours showing the greatest decrease and those at 3 hours the least.

*This work was supported by a grant from the National Science Foundation (Undergraduate Science Education Program)

*Morphological Abnormalities Induced in a Parasitic Wasp by UV.** Reba Wright, Southwestern at Memphis.

Male specimens of *Habrobracon juglandis* were exposed at three embryonic ages (3, 12, or 23 hours) to LD_{50} dosages of ultraviolet radiation (2537 Å). Observations were made during subsequent developmental stages to determine the influence of UV on survival and on external adult structures. There was a 1/3 reduction in the per cent of larvae surviving to the pupal stage in the groups exposed at 12 and 23 hours of age as compared with the controls and the 3 hour experimentals. Only 3.5% of the 12 hour group reached adulthood as compared with about 25% in each of the other groups. Fused antennal segments, short antennae, missing compound eyes and/or ocelli, krinkled wings, unexpanded wings, extra wings, and abnormal tergites were found in the adults. The number of abnormalities occurring among the experimentals was significantly different (2% level) from the number found among the controls.

*This work was supported by a grant from the National Science Foundation (Undergraduate Science Education Program).

The Urino-genital System of Cynops pyrrhogaster. David P. Cooper, Southwestern at Memphis.

This Japanese salamander has a urino-genital system typical of the family Salamandridae, and illustrates the fact that the urodeles set the stage for amniote evolution. The prominent epididymis is composed of modified renal tubules of the sexual or genital mesonephros and is distinct from the secretory or definitive mesometanephros. A longitudinal (Bidder's) canal receives sperm from the testis through the vasa efferentia and is connected to the epididymis by several connecting (afferent epididymidal) tubules. Transverse (efferent epididymidal) tubules, in turn, connect this epididymis to the wolffian (sperm or mesonsphric) duct. Only sperm pass through the wolffian duct. Numerous urinary tubules from the definitive kidney converge into a short ureter that opens into the cloaca through the urino-genital papilla. Prominent ventral parietal glands are associated with the cloacal glands and seem to be unique for this urodele.

Development of Bone and Cartilage in the Hind Limbs of Normal and Thyroxine Treated Rana pipens Larvae. Joseph A. Cameron, Tennessee A. and I. State University.

The hind limbs of two groups of animals, normal and thyroxine treated, ranging from larval stage VII to XX were amputated and stained with specifiic stains for cartilage and bone. Histological sections along with whole mounts of these limbs were studied. Beginning with the earliest stage observed in this study, i.e. VII, the skeletal elements consisted of the femur, tibio-fibula, metatarsals, and tarsals. These elements were primarily cartilaginous during early larval stages. In the experimental group of animals a definite increase in limb metamorphosis was apparent, but no subsequent increase in length was noted. It was concluded that normally bone has its developmental onset between larval stages XI and XIV of *Rana pipens* larvae.

The Influence of Methimazole, Propylthiouricil, and Testosterone on the Thyroid Gland of Inbred Mice. Joseph L. Faison, Tennessee A. and I. State University.

Both methimazole and propyl thiouracil were found to induce thyroid enlargement in certain inbred strains of mice. However, a strain difference was noted in the relative potency of the two goitrogens. The goitrogens themselves differed in their relative potency; methimazole being the most potent. Testosterone was found to interfere with methimazole induced thyroid enlargement. In none of the experimental animals was the thyroid enlargement as great as that obtained in the rats; even when administered in larger dosages by the same route of administration.

The Cytoplasmic Localization, Concentration, and Distribution of Ribose Nucleic Acid in Hemopoesis of the Mouse. George D. Miller, Tennessee A. and I. State University.

The cystoplasmic localization, concentration, and distribution of RNA as related to the synthesis of the chromoprotein hemoglobin was studied in hemopoesis. It was found that RNA reaches its highest concentration in the megaloblast stage where hemoglobin made its first appearance. The concentration of RNA decreased as the concentration of hemoglobin increased through the other stages of hemopoesis. This distribution of basophilia granules, indicative of the presence of RNA, was found to exhibit a definite pattern.

Emission Spectrum of Hexafluorobenzene. Robert E. Bernstein and Cecil McBride, Memphis State University.

The emission spectrum of hexafluorobenzene is very difficult to obtain because the compound decomposes under exitation. However, mixtures of C_6F_6 vapor and rare gases will retard the decomposition process. Electric field exitation using xenon as the rare gas produced an unknown band system which is thought to belong to C_6F_6.

Encouraging Creativity. Harold L. Dillenbeck, East Tennessee State University, Johnson City.

Style in Technical Writing: Some Suggested Improvements. W. D. Reel and C. P. Keim, Technical Information Division Oak Ridge National Laboratory* Oak Ridge.

Four common stylistic flaws make the writing of many scientists and technologists turgid, dull, and unclear. These flaws are 1. unneccessary use of the passive voice, 2. smothered verbs—the transter of every sense to nouns or adjectives, 3. stacked modifiers—the piling-up of modifiers before a noun, and 4. wordiness.

*Operated by Union Carbide Corporation for the United States Atomic Energy Commission