ABSTRACTS OF PAPERS AT SPRING MEETING

Effects of Ionizing Radiation on the Blood Count in the Stone Roller. Donald L. Ray, Middle Tennessee State University. The purpose of this experiment was to show how one form of ionizing radiation can effect the physiological process of blood cell formation in the bone marrow of a selected species of fish, *Campostoma anomalum* (Stone roller). The radiation source was a large Cobalt 60 gamma ray console unit. A Victoreen R-Meter was used to determine radiation dose. The fish were irradiated with an non-lethal dose sufficient to adversely effect the desired blood cell producing organs. Some fish were used as a control group. The fish were maintained after dosage in an aerated and temperature controlled aquatic environment. Each day an irradiated fish was removed and his red and white blood cell count was determined with the use of an electronic Coulter Counter. This experiment lasted fourteen days with the following effects on the blood count: The red blood count decreased to 30% of normal. The white blood count decreased to 17.5% of normal.

This experiment was made possible through the use of the facilities of Middle Tennessee State University and Vanderbilt University and the assistance of Dr. Wymer C. Wiser and Dr. Lane Fletcher of M.T.S.U. and Dr. Joel Bedford of Vanderbilt.

A Study of the Terrestrial Invertebrate Cavernicoles of the Permanent Dark Zone of Jackson Cave in Tennessee. Allen R. Coggins. The distribution and habitats of terrestrial dark-zone invertebrates were investigated, and specimens were collected by trapping, by hand collecting, and with burlese apparatus during February and March, 1969. Representative species of 10 families in the phyla Annelida and Arthropoda were collected. Observations indicated periodic flooding of the cave. Organic debris, mixed with mud, was deposited on the walls, ceiling and floor. These deposits appeared to be the primary food source within the ecosystem. From data collected, the number of species and the number of individuals did not appear to vary inversely with increasing distance from the entrance. Some species were homogeneous in distribution, whereas others occurred only in areas with high concentrations of organic debris. Except for *Lumbricus terrestris,* no organism exceeded 10 mm in length, and no vertebrates were observed. Absence of larger invertebrates and vertebrates usually associated with caves of the area may be due to the periodic flooding.

A New Inner Chelate of o-Carboxyphenyldimethylarsine. Kenneth D. Livingston and James L. Wood, David Lipscomb College. A copper complex of OCDMA (o-carboxyphenyldimethylarsine) has been which appears to be structurally similar to a previously reported palladium complex of OCDMA, [Livingstone and Plowman, *J. Proc. Roy. Soc. New South Wales, 84* 188 (1950)]. Peculiar properties of this complex in solution have been observed and suggest the possibility that molecular association of the complex may occur.

Experimental Studies of Bostick Plasmoids. Pace VanDevender, Vanderbilt University. The phenomena in plasma physics often referred to as the Bostick buttonsource plasmoid was sought with the aid of an image converter camera. Photographs of the discharge in the plane of the external, transverse magnetic field below 700 gauss did not reveal the well-confined structure Bostick has reported. Rather a luminous cloud is ejected with a velocity of 107 cm/sec and follows the field lines to the wall of the chamber when the external field is convex in the direction of axial propagation. When the field is perpendicular or slightly concave with the respect to the axial velocity down the tube, the luminosity does not appear. A plasmoid that allows the plasma to slip across the field without being caught in Larmor orbits may have formed in this case because of a stronger polarization field in the denser plasma near the source.

Foot-thumping in the Mongolian Gerbil. William R. Granger, University of The South. This research dealt with one of the variables that controls foot-thumping in the Mongolian Gerbil. Foot-thumping is thought to be a means of communication, possibly a territory-marking device. An experiment was designed to determine the relationship between territory establishment (home-cage occupancy) and foot-thumping. Twelve gerbils were tested under six degrees of home-cage occupancy—0 minutes, 20 minutes, 60 minutes, 24 hours, 48 hours, and 1 week. The results showed a monotonic increase in foot-thumping as home-cage occupancy lengthened. The differences between these variable conditions were significant at the .01 level by an F test. These results are consonant with the hypothesis that foot-thumping is related to territory.

Laser Diffraction Topology. Albert Bass, Belmont College. A detailed description is given of the effects of a cylinder laid in the path of a laser beam, either parallel or at various angles.

The Effect of Pregnancy on Mouse Peritoneal Fluid Cytology. Gary Campbell, Christian Brothers College. Two ml. of 0.5% glycogen was injected IP into pregnant mice on days 6, 12, and 18 of gestation as well as one week postpartum. Four hours after the injection on these days the peritoneal fluid was withdrawn, slides were prepared and stained by a modified Papanicolaou procedure. 200 consecutive cells were counted and grouped as mesothelial cells, lymphocytes, polymorphonuclear leukocytes, histiocytes, and mast cells. Approximately half-way through gestation the number of mesothelial cells suddenly dropped. Three-quarters through gestation the lymphocytes suddenly took a significant dip and the histiocyte number suddenly increased. The number of polymorphonuclear leukocytes gradually increased, throughout gestation and dropped to normal at one week postpartum.

Dimethylsulfoxide as a transport medium for studying the effects of 8-azaguanine on the Habrobracon

embryo. Claude H. Workman, Southwestern at Memphis. The introduction of chemicals into the wasp egg is difficult because of the relative impermeability of its membranes. Dimethylsulfoxide (DMSO), a highly penetrable solvent of low toxicity, was tested as a transport medium for the base analogue 8-azaguanine. The latter was chosen because its entry produces a detectable effect on the embryo. A solution containing 25% DMSO and 0.1% 8-azaguaine proved to be optimal for this purpose. Results of treatment at various times during the 30-hour embryonic period indicated probable 8-azaguanine incorporation into the embryo's RNA between 15 minutes and 4 hours of age.

A Study of Algae from Pond Specimens in West Tennessee. Ruth Hamblen, Rita Lucas, Paula McDonald, Siena College, Memphis. Samples of pond water were studied for the purpose of finding and identifying algae in the ponds. Two samples were collected in spring under different conditions: one in March before any precipitation, the second in April after several days of heavy rainfall. All samples were obtained from two ponds, designated Pond #5 and Pond #6, at a farm in Germantown, Tennessee. The algae found and identified were: *Anabaena, Euglena, Staurastrum, Closterium, Oedogonium, Gonium, Cosmerium, Diatoma, Meridion, Pandorina, Chaetophora, Trachelamonas, Synedra, Chlamydomonas, Nityschia, Oscillatoria, Navicula, Pinnularia.*

Effects of Hostile vs. Neutral Words on Anagram Problem Solving. John Raines and Edward Nasca, Lambuth College. Twenty 2x2 slides, with 10 neutral and 10 hostile words arranged in a random fashion, having approximately equal frequency, and alternation degree of difficulty with word type. Examples of the neutral words—eagle, hedge, jolly, nurse; examples of hostile words—cruel, curse, fight, spite. Both groups of S's were told that the experiment for which they were participating in dealt with problem solving, namely, anagram solution. The word anagram was defined by the E's and an example was given. The S's were told that their task was to solve a list of 20 anagrams in which they would have 30 seconds for each anagram solution.

The 20 anagrams were projected on a screen in front of a semi-darkened classroom, and each anagram was spelled out verbally by one of the E's to avoid any misinterpretation of the letters by the S's. The S's were told to make the best possible guess if they had trouble reaching a solution within the alloted time. The E's asked for questions. The results of the experiment were found to be in accordance with the E's original hypothesis, which was that a greater percentage of correct solutions would be found in the neutral word list as opposed to the hostile word list. For all S's 192 neutral word anagrams were solved as opposed to only 122 hostile word anagrams. The difference between hostile and neutral words was significant at the .05 level. This would indicate that the hostile words were significantly more difficult to solve as anagrams than the neutral words. Our results indicate that perceptual defense, as a phenomena, occurs in anagram solution.

Building a Spark Chamber Cosmic-Ray Telescope. Samuel Stephen Kiser, Carson-Newman College. This is a senior undergraduate project to build a prototype of a similar project carried on by students at Texas A&M University in the spring of 1968. The project is to build a spark chamber cosmic-ray telescope which will be used to detect and study the interactions of cosmic-rays in the earth's lower atmosphere. This telescope is a system of Geiger tubes, spark chambers, and related electronics with which one may study and actually photograph the cosmic-ray interactions. The Geiger tubes are made from ordinary fluorescent lamps with specially machined end-pieces. The spark chambers are rectangular boxes made from strips of plexiglass with aluminum sheet tops and bottoms. The more important electronic gear consists of the logic circuitry, a Marx generator trigger, and a Marx generator.

The project is financed by a National Science Foundation Grant and is sponsored by Professor Charles E. Magnuson. The student participants are Gary A. Harris and Samuel S. Kiser, senior physics majors at Carson-Newman College.

A Study of the Nuclear Quadrupole Resonance of ^{14}N in Cyanogen Bromide. Russell F. Powell, Carson-Newman College. The basic properties of nuclear quardupole resonance were studied. The BrCN molecule itself is composed of a carbon atom flanked on each side by a nitrogen atom. The molecule is perfectly symmetrical. The BrCN crystal is composed of layers of molecules with one layer pointing opposite to that of the adjacent layer. The Bayer Theory was used to interpret the results of the experiment. Two resonances whose asymmetry parameter varied smoothly and crossed at about 273.15 °K were found.

The Orne Effect with Different Sized Groups. John Chenault, Linda Manship, and Michael Walker, Tennessee Wesleyan College. The purpose of this experiment was to investigate the effect of group size on the Orne effect (willingness to participate in any experiment). Three types of groups were instructed to participate in two tedious tasks—simple addition and letter-digit substitution—with no specific instruction as to how long the experiment lasted. Monads remained at the tasks longest; triads, the second longest; and dyads, the shortest length of time. The results are discussed in terms of Orne's original experiments.

The Effect of Passive and Active Anger Release on Systolic Blood Pressure. Donald and Marion Nation, Tennessee Wesleyan College. The purpose of the experiment was to determine the effect of different expressions of anger induced by harmless electric shock. One group of subjects was shocked but not allowed to view a picture of someone else expressing anger and a third group was allowed to shock the experimenter after they had been shocked. The subjects who were not allowed to express their anger directly showed a significant increase in systolic blood pressure over those who were allowed direct expression.

Religious Uncertainty and Anxiety Aroused in Eighth Grade Students. Stanley Jones, Tennessee Wesleyan College. It has been observed that religious questioning tends to cause anxiety. In this study is was hypothesized that the answering of questions about religion would raise anxiety, that the amount of uncertainty about religious questions would predict the amount of anxiety aroused, and that the males would show more anxiety than the females. Students in an 8th grade class were tested for base anxiety one morning and then retested the next day after taking a test on religious beliefs. A control group was tested and retested on anxiety but given a general information test instead of a test of religious beliefs. The Anxiety Differential Test of Husek and Alexander was used to measure anxiety. Anxiety raised significantly for males but not for females as a function of taking a test on religious beliefs. Amounts of uncertainty did not correlate with amount of increase in anxiety. Overall, males showed a significantly greater increase in anxiety than females.

The Use of Operant Conditioning Techniques with the Brain-Damaged Child. Harold Maready, Tennessee Wesleyan College. The purpose of this study was to demonstrate the use of operant conditioning techniques in an attempt to lengthen the attention span of a brain-damaged boy. This study attempted to lengthen the attention span by giving the subject a reinforcement (soda cracker) for a desired behavior. There were four main types of behavior desired: (1) inter-personal contact, (2) attention to the task, (3) reduction of autistic play activity, (4) reduction of attempts to leave the room. The results showed no significant difference in the inter-personal contact or the attention to the task. There was a significance in the amount of autistic play activity and in the attempts to leave the room.

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A NEW TROGLOBITIC TRICHONISCID ISOPOD OF THE GENUS *CAUCASONETHES*

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ABSTRACT

The new species, *Caucasonethes paynei*, from eastern Tennessee, is the third form of this genus to be described from eastern U.S. caves.

The trichoniscid isopod genus *Caucasonethes* Verhoeff has been known to include only two species, both troglobitic, in the eastern United States. These are *Caucasonethes henroti* (Vandel), from Gilley Cave, Spangler Cave and Gallohan Cave (Number one), all in Lee County, Virginia (Holsinger 1967), and *C. nicholasi* Vandel, from Columbia Caverns, Dickson County, Tennessee (Vandel 1965). This paper describes a third species on the basis of specimens collected from a cave in Anderson County, Tennessee, by Dr. Jerry A. Payne. Types are deposited in the United States National Museum.

Caucasonethes paynei, new species

Description: Generally similar to *C. henroti* (Vandel 1950) and *C. nicholasi* (Vandel 1965). The single male is 2.5 mm long and 0.75 mm wide; the eight females range in length 3.0 to 3.5 mm and in width 1.0 to 1.3 mm. Bodies of the alcohol-preserved specimens without pigment, white or yellowish-white in color.

No eyes present.

Dorsal surfaces of body bearing conspicuous tubercles, which are arranged in four transverse rows on the head, in three rows on pereionite I, in two rows on pereionites II-V, in one or two rows on pereionite VI, and in a single row on pereionite VII; pleonites and telson essentially smooth.

Antennule small; terminal segment bearing four aesthetascs arranged in a row along its edge.

Antenna slightly stouter than that of *C. nicholasi* (Fig. 1). Outer surface of fourth segment with four tubercles bearing long scales, and outer surface of fifth segment with five similar tubercles. Flagellum of three distinct articles, the joint between the second and third apparently immovable; second article bearing a single aesthetasc.

No evident sexual dimorphism exhibited by the legs, but first and second pleopods of male modified as in other members of the genus. First pleopod of male as shown in Figure 2; endopodite elongate and expanded in the distal third; exopodite somewhat narrower than that of *C. nicholasi* and with shorter, more rounded terminal lobes. Second pleopod of male as shown in Figure 3; endopodite with the two segments about equal in length, the distal segment terminating in a fine