

## ABSTRACTS OF PAPERS PRESENTED AT THE SPRING COLLEGIATE MEETINGS

EASTERN REGION  
KNOXVILLE COLLEGE

*The Effect of Water pH on the Birth of Guppies*, Steve Delcour, Roane State Community College. Three tanks consisting of three different pH balances—acid, neutral, and alkaline—were used. In each tank was placed three guppies of comparable size and age. Observations were made to see if the different types of water had any effect on the outcome of baby guppies. Through these observations it was determined that the percentage of survival rate was best in acid over neutral and best in neutral over alkaline. Although there was no significant difference in the overall percentage rate of survival between male and female, there was a ratio of almost one-third more females born over males.

*The Addition Reaction of n-Butylamine to Diethylfumarate*, Darrel Warner and Irving T. Glover, Roane State Community College. In polar solvents, *n*-butylamine adds to the carbon-carbon double bond diethylfumarate to produce 2-*N*-*n*-butylaminodiethylsuccinate. The kinetics of the reaction can be studied by step-wise titration of unreacted *n*-butylamine ( $pK \approx 9.5$ ) and addition product ( $pK_a \approx 5.8$ ) with hydrochloric acid. The reaction follows second order kinetics in 95% ethanol solution.

*The Reaction of n-Butylamine with Diethylmaleate: Kinetics of a Complex Reaction System*, Larissa Radebaugh and Irving T. Glover, Roane State Community College. In polar solvents, *n*-butylamine catalyzes the *cis-trans* isomerization of diethylfumarate to diethylfumarate and simultaneously adds to the carbon-carbon double bonds of both unsaturated esters to give the common product, 2-*N*-*n*-butylaminodiethylsuccinate. The concentrations of *n*-butylamine and the addition product are measured by titration with hydrochloric acid, while diethylmaleate and diethylfumarate are determined by gas chromatography. The rate constants for the reactions are estimated by numerical analysis with the aid of a computer.

*An Assessment of a Stream Ecosystem by Predictive Modeling II. Rural Land Use*, Ball, A. R., Casparis, R. Curry, B. Estes, M. Gooden, L. Guerrini, M. Hale, W. Kern, J. Knapp, G. Litchford, P. Perfetti, D. Spires, J. St. Clair, and A. Wood. The University of Tennessee at Chattanooga. Hogjowl Creek, a head-water source in the South Chicamauga Creek Drainage, was established to furnish base line data for subsequent studies on the stream quality for the entire water shed. Data obtained in 1979/1980 were used as input for a predictive model utilizing the soil loss equation. Overall assessment was obtained by remote sensing techniques and ground truthing. Best fit data produced predictive annual soil loss and stream loads of sediment, litter, nitrogen, phosphate, potassium, BOD, and TOC. Input was converted to suggest Best Management Practices and predictive improvements were obtained. Acquisitions of input data, computer methods, and significance of results will be discussed.

*Some Properties of Copper Compounds Prepared from the Metal and Trichloroacetic Acid in Different Solvents*, Rina Quijada, Ron Beaudreau, Bryan College. In continuing research on salt of Trichloroacetic Acid and copper, more was learned about their physical properties. The solvent for the reactions was water. Heat was applied in all cases, in contrast to previous research. The reactions performed most recently were carried out under three different control conditions, with the variable in each reaction being only the molar ratio between copper and Trichloroacetic Acid. Increase in the molar concentration of the Trichloroacetic Acid yielded a significant increase in reactions rate. The products in each reaction had similar solubilities with Cupric Chloride.

Comparative solubility tests were also performed on the products of Trichloroacetic Acid and copper in Dimethylsulfoxide. Regarding solubility these products appeared most similar to Cuprous Chloride.

*A Continuing Study of the Reaction of Trichloroacetic Acid and Elemental Copper in a Dimethylsulfoxide Medium*, Terry Lee Puckett, Bryan College. A study of the reaction of Trichloro-

acetic acid and elemental copper using a Dimethylsulfoxide medium revealed the molar quantities and properties of the products to be dependent upon the molar ratios of both reactants and medium. Varying the concentration of the three reactants yielded products unique to those ratios. However, certain concentrations of these compounds react with an almost explosive force; consequently such reactions should be carried out with extreme caution. Reactions in DMSO are in the order of 100 times as fast as the reaction of Copper and Trichloroacetic acid in water. In addition, the concentration of solvent enhances the reaction up to a certain mole fraction and beyond that the effect of solvent is slight. Further study has revealed that portions of the DMSO molecule are incorporated into one of the products for at least one of the systems studied. Additional investigation suggests that the reaction appears to follow different pathways and with different reaction rates. One of the systems studied yielded a product with the empirical formula of  $Cu [S(CH_3)_2]Cl$ . Further studies of the reaction are necessary to determine the reaction pathways and products.

*The Impact of An Undergraduate Emphasis On Research Training*, Reid Jones, Jesse James, Mary Brown, and Prince Brown, Knoxville College. Knoxville College is a small, private college which has emphasized research training and science education for more than a decade. Projects in biochemistry, biology, psychology and sociology are described. External funding has been provided from the National Institutes of Health, the National Science Foundation, the Department of Education, and the Lilly Endowment. While each of these projects had discipline-specific objectives, they shared the goal of providing research training to give breadth to the undergraduate experience. Participants describe the general impact of this institutional focus on academic programs, facilities, and graduate placement.

*Characteristics of Greeting Behaviors On a Black Campus*, Dan Falconer, Knoxville College. Student interactions were videotaped for 20 minutes/day for 15 days at a central location on a black college campus. A checklist was developed for cataloging and tabulating various nonverbal cues utilized by the black college student. Three independent raters achieved over 88% agreement using the checklists while watching the videotapes. Observations which were not unanimously recorded were dropped from the analysis. Males initiated and responded more frequently to the "hand grasp". Females were more likely than males to initiate and respond to "other touches". Dividing the duration of communication into "long" and "short" categories demonstrated that males were more likely to be involved in extended communications while females went on their way more quickly. "Giving skin" was almost never observed. Although this behavior is frequently associated with the black culture, it appears to occur only during interactions involving a high degree of arousal such as athletic competition or greetings which followed long absences. Generally, black greeting behaviors appear to involve less symbolic significance than during the Black Pride era.

*Affective Reactions to Self Paced Instruction*, Cynthia Mooror, Knoxville College. 49 students enrolled in a self paced CMI course in Introductory Psychology were given points for completing a post-course questionnaire. There was a clear preference for the use of self paced formats over traditional lecture style courses. Further, students indicated a non-significant preference toward taking their tests at the computer terminal rather than using a print out of the test. The questionnaire also asked students to estimate the number of contacts with the course instructor and with student proctors assisting in the course. Two groups were formed on the basis of overall reaction to the course: favorable and unfavorable. A  $2 \times 2$  ANOVA was performed to evaluate the instructor contacts and the proctor contacts within each group. A significant difference was found showing that the students rating the course favorably also had more contacts with instructors and with proctors. There was no reliable difference between the number of contacts addressed to instructors vs. proctors.

*A Descriptive Study of Reactions to First Offenders*, Louise Fletcher, Knoxville College. A questionnaire was distributed to 80 white university subjects in the student dining area. Each questionnaire contained a "scenario" which briefly described the situation of a first offender who had received a probated sentence. The race and sex of the offender were systematically varied and the order of presentation was counterbalanced, allowing for 20 responses to each of the resulting scenarios. White male subjects were affected by the race of model in the scenario, but no other racial differences were noted. White female subjects favored more control and training during the probation period than did white males. Implications for study of other populations were discussed.

*Minority Role Models in Introductory Psychology Textbooks*, Willie Lott, Knoxville College. The pictures in introductory psychology textbooks may act as a determinant in attracting students to careers in that field. Minority students may be discouraged from psychology by failing to see pictures of minorities involved in or affected by the theories and research discussed. A survey of the pictures in each of two texts from 1968 till 1980 showed a significant underrepresentation of both women and blacks. A significant interaction demonstrated that the proportional representation of minorities increased relative to white males for that period. However, the increase was small and for each of the last five years there has been an increase in the pictures of white males. It is suggested that recent political trends may have offset the slight gains made during the emphasis on affirmative action.

*Biomass Potential of Some Native East Tennessee Plants*, Virden Spicer, Jr., Lincoln Memorial University. The heat of combustion of three native East Tennessee plants (pokeweed, ragweed, and kudzu) was determined and compared to the known values of wood and coal. It was found that of the three plants that pokeweed stems were the most energetic at 3885 cal/g.

It was found that the heat value for the plants were higher than that for hardwoods but lower than that for softwoods and much lower than that for coal.

## MIDDLE REGION

### AUSTIN PEAY STATE UNIVERSITY

*New Vertebrate Fossil Sites in Middle Tennessee*, Timothy L. Riddle and James X. Corgan, Austin Peay State University. Four new vertebrate fossil sites have recently been discovered in Middle Tennessee: in Town Cave at Centerville, at surface site in central Hickman County, in Silvey Cave in Montgomery County, and a surface site near Hills Mill in Robertson County. Each site yields fossils of Pleistocene age. Town Cave yields Peccary (*Mylohyus*) and bear (*Ursus*). Two extraordinarily large horse teeth, referable to *Equus*, come from the Hickman County surface site. A single tooth, probably from a peccary, is all that has thus far been recovered from Silvey Cave. The Hills Mill site yields a single phalangeal element from the foot of a horse (*Equus*). All sites conform to known distribution Patterns for the genera yield. This study is part of a continuing effort to document the vertebrate fossil faunas of Tennessee.

*Karst Hydrology, Morphology, and Water Quality in the Vicinity of Cookeville, Tennessee*, Joe Faulkerson, Tennessee Technological Univ. The study area is under the influence of four basic formations; Ft. Payne, Warsaw, St. Louis, and Monteagle formations all of which are Mississippian in age. The Ft. Payne is not conducive to cave development. All the other above mentioned formations have some degree of passing development. Sinkhole density increase to the east of the study area where there are thicker carbonate exposures. Approximately 3850 acres of Cookeville's drainage system was traced using Fluorescein and Rhodamine-WT dyes. About 3030 acres of the above figure contributes to the Pigeon Roost Creek drainage basin, which flows southward from Cookeville. The researchers noticed a drop in the dissolved oxygen of the Pigeon Roost Creek system from 7mg/l in 1975 to 1.97mg/l during this study. This may indicate the introduction of organic pollutants between test periods or the "drought-like" enrichment during the study period. Four basic trunk passage trends were found; two major ones trending north-east and two minor ones trending northwest. Sandstone units

were found associated with all the cave entrances. These units are thought to have some kind of control over the location of cave development.

*A Survey of Spiders in Rutherford County, Tennessee*, Donna Gooch, Middle Tennessee State University. Spiders were collected in September through December, 1980. The spiders were hunted (and found) in caves, fields, houses, gardens, grasses, bushes, old barns, under rocks, and next to creeks.

The habitat, type of web, and anatomical characteristics were used in identifying the 100.150 specimens collected.

Representatives of 13 families were collected and identified. Included were members of the following families: Araneidae (The Orb Weavers), Pholcidae, Salticidae (The Jumping Spiders), Thomisidae (The Crab Spiders), Lycosidae (The Wolf Spiders), Pisauridae, Theridiidae, Argiopidae (The Garden Spiders), Agelenidae, Clubionidae, Loxoscelidae (Brown Recluse), Linyphiidae, and Tetragnathidae.

*A Proposed Model for the Three Dimensional Configuration of 40S hnRNP particles*, Thomas C. Andrews, Vanderbilt University. 40S hnRNP particles are composed of six main structural proteins with molecular weights of 32,000 to 44,000 daltons organized in discrete stoichiometric ratios. Interpretation of three different areas of experimentation has led the author to a proposed model for the three dimensional configuration of these 40S particles. First, certain of these proteins are sequentially lost from the 40S particle upon ribonuclease and trypsin digestions performed by Leonard Lothstein. Second, protein cross-linking studies, also performed by Lothstein, have shown that these six proteins are involved in highly specific homotypic and heterotypic associations. Third, electron microscopic studies previously have revealed structural homogeneity in the ribonuclease resistant core particle, which is composed almost entirely of two of the six low molecular weight proteins. The model postulates twelve discrete subunits arranged three dimensionally in an icosahedron with the RNA looped around each subunit in a non-random manner. Each subunit is composed of twelve of the low molecular weight proteins in ratios of 3:3:1:1:3:1 for proteins A<sub>1</sub>:A<sub>2</sub>:B<sub>1</sub>:B<sub>2</sub>:C<sub>1</sub>:C<sub>2</sub> respectively. The proposed model for 40S hnRNP is consistent with all experimental data at this time and, should further experimentation prove supportive, may provide insight into the role of hnRNP in processing of the nascent RNA transcript.

*Caloric Values of Golden-Aster by Bomb Calorimetry*, Janet Hiers and Patsy Slatton, Middle Tennessee State University. The bomb calorimeter was used to determine the caloric values of each of the following parts of Golden-Aster (*Chrysopsis* sp.): fruits and flowers combined, leaves, stems, and roots.

Standard procedures for the Pair Oxygen Bomb were followed. Results indicate that fruits and flowers (combined) had the highest caloric values, followed by leaves. These results are consistent with published data on Golden-Aster.

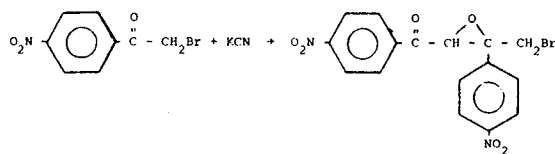
| Organ              | Caloric Value(cal/g) | %    |
|--------------------|----------------------|------|
| fruits and flowers | 4484.623             | 34.0 |
| leaves             | 4028.831             | 30.4 |
| roots              | 2492.170             | 18.8 |
| stems              | 2209.510             | 16.8 |
| total              | 13215.134            |      |

*Studies of the Reactions of 8-Hydroxynaphtho[1,2-c][1,2-5]oxadiazole*, A. C. Kovelesky & F. K. Jones, Middle Tennessee State University. The 8-hydroxynaphtho[1,2-c][1,2,5]oxadiazole structure thus required to conduct this study was known prior to the beginning of this work. It was synthesized by the reaction of 1-nitroso-2,7-dihydroxynaphthalene with hydrochloride in the presence of sodium hydroxide in 74% yield. The reactions to be studied are typical aromatic substitution reactions, such as halogenation, nitration, Friedel-Crafts acylation and alkylation. These results will be compared to the results obtained with the parent compound, naphtho[1,2-c][1,2,5]oxadiazole. In this case either an addition product or a substitution product resulted depending on the reaction conditions. In the case of the 8-hydroxy compound, the halogenation reactions were carried out using solvents of different polarity, varying the time of

reaction, and the amount of halogenating agent. Initial experiments indicate that the strongly activating hydroxyl group has a pronounced influence on the substitution pattern and would give the expected ortho substitution similar to a substituted phenol. The resulting products will be identified by their spectral data and elemental analyses.

*The Generation and Insertion Reactions of a Highly Reactive Sulfur Species*, Valerie Ravan, Vanderbilt University. Singlet sulfur, (S<sup>1</sup>D), is a highly reactive form of sulfur that has biological significance in view of its reactions with several components of the cytochrome P-450 molecule of the liver. We have succeeded in developing a standard procedure for the photochemical production of singlet sulfur. Upon exposure to UV light ( $\lambda = 2537 \text{ \AA}$ ), gaseous COS dissolved in cyclohexane will yield carbon monoxide and the reactive sulfur moiety. Singlet sulfur is "trapped" by its insertion into the C-H bond of the solvent to yield cyclohexanethiol. Samples of the photolysis mixture are analyzed by gas chromatography; the maximum yield of cyclohexanethiol occurring after 6 hours of photolysis. We have sought to define the best chemical trap for singlet sulfur by studying the effects of other functional groups upon the yield of cyclohexanethiol during photolysis. Among others, the S-H bond has been found to compete with the C-H bond for singlet sulfur insertion. The hydrodisulfide thus formed provides a chemical model and chemical evidence for the proposed effect of singlet sulfur on the components of the cytochrome P-450 molecule.

*Factors Affecting Yield in the Synthesis of 4-oxo-2,3-epoxy-2,4-bis(p-nitrophenyl)-1-bromobutane*, Patrick Townes and Dr. James H. Hutchinson, Jr., Department of Chemistry and Physics, Middle Tennessee State University, Murfreesboro, Tennessee 37132. The synthesis of 4-oxo-2,3-epoxy-2,4-bis(p-nitrophenyl)-1-bromobutane from p-nitrophenacyl bromide by the nucleophilic attack of cyanide ion proceeds in very low yield.



To increase the yield of the reaction, various reaction conditions were studied. The results of this work will be discussed.

*Proton Magnetic Resonance Spectrum of HDO*, Sharon A. Churchill, Roy W. Clark, and Martin V. Stewart, Middle Tennessee State University. The rapid rate of proton transfer in H<sub>2</sub>O-D<sub>2</sub>O mixtures under ordinary conditions is shown by a sharp pmr singlet derived from the time-averaged environment of the exchanging protons, but a dramatic slowing of chemical exchange between H<sub>2</sub>O, D<sub>2</sub>O, and HDO occurs in dilute acetone solution. We recently reported (TAS Annual Meeting, ORNL, Nov. 1980) the first fully resolved HDO pmr spectrum as a triplet upfield from an H<sub>2</sub>O singlet on a 90 MHz instrument. Our immediate goal of acquiring a more accurate H-D spin-spin coupling constant for the triplet to replace the older literature value obtained through line-shape analysis of an only partially resolved 40 MHz spectrum is relevant to recent theoretical calculations of geminal coupling. Support by the MTSU Subcommittee on Research is gratefully acknowledged.

*Densification of Loose-Fill Thermal Insulations Due to Vibrations or Impacts*, James H. Wright, Tennessee Technological University. Conservation of energy in homes is assisted by installation of insulation in walls, attics and under floors. Vibrations transmitted to blown or poured loose-fill insulations by adjoining surfaces cause the loss of interstitial air spaces. Laboratory results have been obtained for the effect of vibrations or impacts on the density and thickness of horizontally applied loose-fill insulations. The results for loose-fill mineral fiber and cellulose materials are being used to establish a rational test for the design density to be used in constructing coverage charts for commercial products.

*Laboratory Determination of Cleaner Effectiveness*, John R. Warren, Tennessee Tech University. Modern liquid cleaners are complex mixtures containing many compounds. Many products contain materials which are added to reduce the surface tension

of the cleaning solution. The objective of the work being reported is the development of a laboratory test to evaluate commercially available products.

A visual test for cleaner effectiveness has been devised. The test was suggested by an ASTM procedure. Results of the cleaning test have been obtained as a function of cleaner concentration in aqueous cleaning solutions. Surface tension measurements were also made in order to determine the usefulness of surface tension as a prediction of detergency.

It has been found that the surface tension lowering effect of some cleaners is not matched by a detergency increase. The visual test has proven to be effective in the determination of the detergency of an aqueous cleaning solution.

## WESTERN REGION MEMPHIS STATE UNIVERSITY

*Hemisphere Specialization by Handedness and Sex*, Daniel J. Dierkes, Christian Brothers College. The subject were 20 students; 10 right-handed and 10 left-handed, with 5 males and 5 females in each group. They were classified on the basis of a 17 item questionnaire that asked hand preference for unimanual tasks such as writing, drawing, throwing, etc. An alpha wave output was recorded using a Biosone II Brainwave Monitor interfaced with an MK-II Physiograph through an amplifier while the subjects performed four tasks: reading, listening, writing and puzzle-making. Electrodes were placed on the forehead and over the left and right occipital regions. Measurements were taken for two minute periods for each task. Outputs from the right and left occipital regions were compared within and among the groups.

The results showed that for writing, virtually all of the subjects showed hemisphere specialization opposite to handedness. The other tasks showed no significant differences in hemisphere specialization.

*Investigation of B-Cell Dependent Immunity*, Michael G. Goold, Christian Brothers College. Hemolytic plaque assay was used to find antibody-producing cells from rats immunized with sheep erythrocytes (SRBCs). Rats were given .2-2.0 ml subcutaneous injections of 2% SRBCs into the rear flank. After four days, rats were sacrificed and spleens were excised and the number of anti SRBC antibody-producing cells estimated by hemolytic plaque assay.

No antibody producing-cells were found from any animal perhaps due to too short a time after exposure to the antigen or insufficient amount of antigen administration.

*Escherichia Coli Resistance to Streptomycin*, Mark D. Hannis, Christian Brothers College. Streptomycin resistance in *E. coli* was investigated. Resistant mutants of *E. coli* were isolated in streptomycin gradient plates of nutrient agar. The level of streptomycin resistance for the isolates was determined to be not greater than 200 mg/ml by using serial dilution of streptomycin in nutrient broth. The results suggest genetic mutation as the mode of resistance to the antibiotic rather than episomal enzyme inactivation of the streptomycin.

*Investigation of Virus Population in Canadian Waterfowl*, 1980, Kristine L. Harrington, Christian Brothers College. Feral ducks in the Vermillion area of Alberta, Canada, were tested for the presence of virus in August of 1980 as a continuation of a longitudinal study started in 1976. As in previous years, influenza A and paramyxoviruses were isolated most frequently from apparently healthy ducks. The viruses were isolated most frequently from mallards and pintails, but were not restricted to these species. In 1980, 157 influenza viruses were isolated from 744 ducks, an incidence rate of 21.2%.

In 1980 eleven different combinations of hemagglutinin and neuraminidase subtypes were isolated. The predominant subtype was Hav7 Neq2.

Paramyxoviruses were isolated from only 49 of the ducks tested which is a much lower frequency than that of the influenza A viruses. In 1980 lentogenic NDV was the only paramyxovirus isolated.

This study adds support to the theory that ducks are a perpetual and diverse reservoir of influenza viruses and paramyxoviruses.

*The Effect of Thiabendazole On Infection of Trichinella Spiralis in Rats*, Laurence Howe, Christian Brothers College. Thia-

bendazole is the drug of choice for treatment of infection by *Trichinella spiralis*. The effect of the time of administration on prevention of *Trichinella* was investigated using rats. Experimental animals were given thiabendazole orally 5 days before, 5 days after, and both 5 days before and after oral administration of about 1300 *Trichinella* larvae obtained by pepsin digestion of muscles from an infected rat. A control animal was given no drug.

All animals were sacrificed after 30 days and 10 micron sections of diaphragm, tongue, and gastrocnemius were prepared, stained, and inspected for the presence of *Trichinella*. No evidence of infection was found in any of the animals including the control, indicating insufficient or inviable inoculums or insufficient time for incubation.

*The Effects of Ephedrine On Human Heart Rate and Blood Pressure*, Mary V. Jenkins, Christian Brothers College. Ephedrine is one of the oldest known sympathomimetic drugs known, having actions similar to epinephrine and antagonistic to histamine. The study conducted was to determine the effects of varying amounts of ephedrine on blood pressure and heart rate in a 22-year female subject. Blood pressure and heart rate were monitored at ten minute intervals for one and one-half hours following ephedrine administration to determine the time at which the drug began to take effect. Doses of 24 to 96 mg. were used.

Ephedrine caused dose-dependent increases in blood pressure and pulse rate starting by 10-20 minutes after ingestion and peaking at about 50 minutes. The subject also reported subjective feelings of nausea, insomnia and nervousness which persisted from 24-48 hours, depending on the dose.

*Effects of Dimethyl Sulfoxide On Fetal Development of Mice*, Ralph Landry, Christian Brothers College. The effects of Dimethyl Sulfoxide (DMSO) on the fetal development of mice was studied. A DMSO 70% liquid was applied topically to the backs of virgin female laboratory mice, and allowed to remain until absorbed. Males were introduced for impregnation and the DMSO treatment was continued until term. The offspring were compared to a control group receiving no DMSO. There were no substantial physical differences found between the offspring. The standard deviation of mean weight set of the first generation experimental was .169, of the second generation experimental was .157, and of control was .292. A hypothesis testing of means show both generation experimental to fall within the accepted limits with a .01 level of significance.

*An Investigation of Possible Synergism Between Carbenicillin and Gentamycin and Between Carbenicillin and Amikacin On "Enterobacter Aerogenes"*, N. B. Perkins, Christian Brothers College. The increasing incidence of bacteria immune to drugs once used in their control has prompted investigation into the possible usefulness of synergistic combinations of antibiotics.

This study looked into potential synergy between gentamycin and carbenicillin and between amikacin and carbenicillin in *Enterobacter aerogenes* in both pairs of drugs inhibitory concentrations were found that were as low as one fourth the inhibitory concentrations of the drugs used separately.

*Preliminary Study On Bait Trapping at Meeman Biological Station*, Joseph K. Harris and Omar E. Smith, Memphis State University. This undergraduate field study was conducted at Meeman Biological Field Station between the dates of June 15 and August 29 the year of 1980. The goal of this study was that of preparing an extensive insect collection with the use of bait traps. The study also tested variations in bait trap methods and pinpointed existing habitats of insect species in our locality. Eighty-one bait traps were employed which were checked every other day with consideration being given to such things as trap color, height, bait type, eco-system location as well as effects from weather including temperature, cloud cover, wind speed and barometric pressure. As for highlights of this bait trapping study there was one specie of Cincindelidae whose range was extended by some 400 miles across the state. Information from weather and sun movement compiled by this study is in the process of statistically being broken down by computer as will the information gathered in during the summer of 1981.

*Molecular Weight Distribution of Ribosomal Subunit Proteins*, Gene Price, Christian Brothers College. Ribosomes were extracted from  $S^{35}$  methionine-exposed fat head minnow cells grown in tissue culture. Purified preparations of 80S ribosomes and 60S and 40S ribosomal subunits were analyzed by SDS polyacrylamide gel electrophoresis to estimate the molecular

weights of their constituent proteins. The expected overlap of bands between individual subunits and the intact ribosomes was not readily apparent.

*Pharmacological Characterization of Cannabichromene (CBC)*, Sara Shannon Purvis, Christian Brothers College. The effects of cannabichromene (CBC) were investigated. The  $LD_{50}$  in rats was 1002 mg/kg body weight. 20 mg/kg CBC lowered body temperature significantly one hour after injection. 40 mg/kg CBC lowered body temperature significantly for three hours after injection. 80 mg/kg CBC lowered body temperature significantly for five hours after injection. In rats pretreated with Ro4-1284, no dose of CBC up to 80 mg/kg offered protection from convulsions induced by maximal electroconvulsive shock, and 40 mg/kg CBC cancelled the protection offered by 60 mg/kg  $\Delta_9$ -tetrahydrocannabinol. In rats not pretreated with Ro4 offered the same protection. In mice, no dose of CBC up to 80 mg/kg produced handling-induced convulsions. 40 mg/kg CBC pretreatment increased the severity of HIC produced by 20 mg/kg THC, though not significantly.

*Irreversibility of Dialdehyde Affinity Labelling Reagents*, Thomas F. O'Brien, Christian Brothers College. In recent years, researchers have attempted to characterize the active sites on enzyme and antibody molecules using affinity labelling reagents, commonly dialdehydes, which were thought to react reversibly with lysinyl residues on the active site to form Schiff bases. In the present study, preliminary results indicate that the treatment of a Bovine serum albumin-tritiated uridine dialdehyde complex (BSA- $^3H$ -UR) with phenylhydrazine failed to release the tritium label from the protein suggesting that the aldimine linkage of the Schiff base underwent the Amadori rearrangement to form a ketoamine, stable through treatment with phenylhydrazine. This data would suggest that the reaction between a dialdehyde and a protein is neither reversible nor specific, and, as such is of little value in the research of the active sites on enzyme and antibody molecules.

*The Effect of Monoclonal Antibody F(ab)<sub>2</sub> Fragments On the Hemagglutinin-Neuraminidase Glycoprotein of Sendai Virus*, Robin Renner, Christian Brothers College. The monoclonal antibodies S15 and S18 are specific for the hemagglutinin-neuraminidase glycoprotein (HN) of Sendai virus. These antibodies were cleaved by pepsin into F(ab)<sub>2</sub> fragments. The smaller fragments of the S15 antibody retained inhibiting abilities for hemagglutination and neuraminidase activity but the S18 which had less inhibitory activity originally lost essentially all inhibitory activity after fragmentation. Since the antibody fragments retained activity although reduced in size, this indicates that the antigenic sites causing hemagglutination and neuraminidase activity on the Sendai virus are either the same site or sites very close together. The other possibility, that of steric hindrance by the antibody of one site if the two sites are farther apart on the protein, can be essentially ruled out since the cleaved fragments maintained inhibiting properties.

*Effects of Tylorone On Collagen-Induced Arthritis in Rats*, Diane C. Vincent, Christian Brothers College. The effect of tylorone on the immune response to type II collagen was tested in rats. All rats were observed daily for the development of collagen-induced arthritis and bled retroorbitally for determination of antibody levels to type II collagen at 14 and 21 days post immunization.

The immune response to collagen was suppressed by pre-treatment with tylorone but was enhanced and prolonged by post-treatment. Sera analyzed by ELISA showed the titre of anticollagen antibodies to parallel the clinical course of the disease.

*Effect of Saturated and Unsaturated Fats On Human Coagulation Time*, Gloria Hobbs, Christian Brothers College. A four-day experiment was devised to study the effect of butter and margarine ingestion on blood clotting activity. On day 1, regular meals were eaten. On day 2 no visible fat was ingested. On day 3 and day 4, excessive butter and margarine were consumed, respectively. Both the saturated butter and unsaturated margarine had effects upon the clotting time, which showed an increase in activity with butter and a decrease with margarine.

*A Comparison of Two Standard Antibiotic Susceptibility Tests*, Ginny Dodson, Christian Brothers College. Two clinical tests are commonly used to determine the susceptibility of microorganisms to antimicrobial agents, the Kirby-Bauer, or paper disc diffusion method, and the serial tube dilution method. These

were compared by testing identical microorganisms and antibodies in each test to find susceptibility ranges. The Kirby-Bauer was found to be the more accurate of the two in that it is a faster, more efficient way of determining general susceptibility. The tube dilution method was found to be more complicated, take a longer period of time, and to be more subject to experimental error due to the extensive amount of measurement and dilution involved.

*The Immunologic Enhancement of "Carassius Auratus" Vibrio Angullarium*, Charles Kuehl, Christian Brothers College. This study involved triggering an immune response in *Carassius auratus* (the goldfish) to peritoneal pathogen, *Vibrio angullarium*. An attenuated form of the bacteria was introduced into the fish without any visible side effects. The vaccinated *Carassius auratus* was then able to withstand greater concentration of the *Vibrio angullarium*.

*The Marmoset As An Animal Model for Colonic Cancer Studies*, Charles D. Longserre, L. B. Coons, Louis J. Annaratone, G. E. Peterson, Department of Biology, Memphis State Uni-

versity. A 1978 report from the Oak Ridge Associated Universities (ORAU) noted that colonic adenocarcinoma, an affliction usually seen in only man and carcinogen-treated rodents, was found in necropsies of 14 of 206 marmosets of the species, *Saguinus oedipus oedipus*, while no cases were found in 710 postmortem examination of *Saguinus fuscicollis*. The possible interaction of diets and intestinal microbes in the etiology of colonic cancer is controversial, so we microbiologically analyzed fecal specimens from ORAU marmosets which were not treated with known carcinogens and fed the same diets. Neither the numbers of viable anaerobically-grown bacteria nor the direct microbial counts nor the coliforms nor the enterocci differed significantly between feces from the two species. However, lactobacilli and the total, aciduric, gram-negative bacteria were very significantly more numerous in fecal specimens from *S. fuscicollis*. SEM studies of gold-coated surfaces of normal and cancerous marmoset colons appeared strikingly different both at the cellular and more gross levels and could be correlated with bright field histopathology.

## SCIENCE MEETINGS LOCAL, REGIONAL AND NATIONAL

Tennessee Academy of Science  
Austin Peay State University  
November 20-21, 1981

National Association of Biology Teachers  
Las Vegas, Nevada  
October 22-25, 1981

NSTA Regional Conference  
Opryland Hotel in Nashville  
November 19-21, 1981

NSTA Regional Conference  
Knoxville, Tennessee  
October 21-23, 1982

Science Association of Tennessee  
Kingsport, Tennessee  
October 16-17, 1981

Tennessee Energy Conference  
Univ. of the South, Sewanee, TN.  
September 18-20, 1981

LBL Educators Retreat  
Paris Landing Inn, Buchanan, TN.  
March 28-30, 1982

NSTA 30th National Convention  
Chicago, Illinois  
April 2-5, 1982