FIFTEENTH ANNUAL MEETING OF THE COLLEGIATE DIVISION
OF THE TENNESSEE ACADEMY OF SCIENCE

Saturday, November 28, 9:00 AM
Maning Hall, Memphis State University
Robert E. Martin, Chairman, Tennessee Polytechnic Institute

MATHEMATICS SECTION
This paper shows a necessary and sufficient condition such that f(t) = 1
If f(x) = \int f(x), K(a,x) dx is called the integral transform of the function f(x) by the kernel K(a,x).

PROCEEDINGS OF THE COLLEGIATE DIVISION OF THE TENNESSEE ACADEMY OF SCIENCE

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BIOLOGY SECTION
Preparation of Rat Intestine for Ion Transport Studies. Dan Monroe, Christian Brothers College.
Isolation and preparation of small intestine of the rat for study of heavy metal ion transport by everted intestinal loops are considered according to the method of L. H. Wilson and G. Wiseam. The intestine is trimmed of fat and connective tissue while the blood is anaesthetized by anaesthesia. Four consecutive segments from the junction of the duodenum and jejunum to the ileocolic valve are resected from the loop and tied to a syringe tip immersed in the medium. A positive-reading electrode is placed inside the syringe barrel containing 2 cc of the medium. The other electrode is placed in 800 ml of outside solution at 37°C. A vibrating- Reed electrometer measures the d-c potential across the intestine, while the final ion-concentration is determined by flame spectrophotometry and radioisotope techniques. A short discussion follows on the application of these techniques to the study of heavy metal ion transport across rat intestine.

The Effect of Ribonuclease Acid, Deoxyribonuclease Acid, Folic Acid, and Some Essential Amino Acids on Embryonic Development of Chick.* Mildred L. Guinn and William Darden, Tennessee Agricultural and Industrial State University.
Experiments were conducted to determine the effect of ribonuclease acid, deoxyribonuclease acid, folic acid, arginino, lysine, tryptophan, and methionine on the development of chick embryos.
The eggs were selected on the basis of weight, internal and external defects, and cleaned with 70% ethanol. They were punctured with a sterile egg puncher, and the chemicals were injected into the albumin with a number 22 or number 27 hypodermic needle, attached to a 1 cc syringe containing the chemical solution. In Experiment I the eggs were injected with .05 cc of each of the protein solutions prior to incubation. In Experiment II, Series I, the eggs were injected with .05 cc of each of the 2 mg/cc protein solutions and an injection

SERIES II .05 cc of each of the 20 mg/cc protein solution after seven days incubation. All treatments were started when controls showed an added concentration of H positive ion and nitromethane solvent. HBr serves as a positive catalyst in the reaction by furnishing an added concentration of H positive ion. An increase temperature of 10° C seems to increase the rate of reaction. HBr and the formation of trimethylamine from disproportionation into ions. This investigation was supported by the Undergraduate Research Participant Program Research Grant GE-4010, National Science Foundation.

Seeing with Sound. Larry D. Flatt, Tennessee Polytechnic Institute.
An experiment was set up to test the theory that it is through Frequency Modulation that a bat is able to recognize his own signal. A tape recorder, a specially constructed amplifier, a movie camera, and an oscilloscope were used in the experiment. The bats were released in a room in which six different wire mesh had been set up. As the bats approached the maze, a noise was made and was synchronized with a tape recording of the audible signal. The pictures were taken also of the waves on the oscilloscope. The bats were made audible through the use of the specially constructed amplifier. After studying the collected data, the following statements could be made. The carrier wave of the FM signal of each bat varied greatly from any other signal around him. Even when bats were on the same frequency the difference in the carrier wave, no matter how much would be enough to distinguish each bat's signal from that of another.

A report on a space student project at Redstone Arsenal. Details of writing a computer program in Fortran for atmospheric properties as a function of altitude are discussed. The relationships among pressure, temperature, density, molecular weight, viscosity, speed of sound, Reynolds number, radiation due to gravity, geopotential and geometric altitude are presented.

NEW MEMBERS OF THE TENNESSEE ACADEMY OF SCIENCE, 1964
Ahum, Dr. Orin L. (Zoology), Animal Science Dept., Tenn. A and I State Univ., Nashville, Tenn.
A and I State University, 1725 Simpkin St., Nashville, Tenn.
Nad, Dr. Irwin L., Ann. Dept., Univ. of Tenn. Med. Univ. 62 South Capitol, Memphis, Tenn.
Butler, Dr. Charles C. (Botany), Lab. of Nuclear Med. & Radiol. 900 Angelus, Calif.
Booth, Dr. Sandra (Botany), Univ. of Tenn., Knoxville, Tenn.
Bryant, Eugene T. (Botany), 700 Jonathan Ave., Knoxville, Tenn.
Black, Hurley Daleno, Biology Dept., Memphis State Univ., Memphis, Tenn.

Callis, Charles P. (Physics-Astronomy), 111 Edgerton, Martin, Tenn.
Carter, Jordan P. (Science-Mathematics), Route 1, Delano, Tenn.
Chandler, William A. (Chemistry-Physics), 4148 Greerland Dr., Winterville, Tenn.
Cone, William T. (Geology-Graphics), 4699 Shiflet, Memphis, Tenn.
Cooper, David P. (Zoology), 105 Peach Bloom Dr., Chatta-
County, Tenn.
Davis, Dr. James H. (Geology-Graphics), TVA, Mineral Res.
Sec., Geology Unit, Union Branch, New Johnson City, (153) 59th St. S., Jackson, Tenn.
David, Milton (Chemistry) (Continued on Page 75)