

samples of weevils from the Gast Boll Weevil Rearing Laboratory at Mississippi State University. Program 0 (pulse-field electrophoresis) was found to be equal to, if not better than, standard native gel electrophoresis. Variation in voltage is discussed.

CONTROL OF THE BAROREFLEX RESPONSE TO AN INCREASE IN BLOOD PRESSURE BY THE DIAGONAL BAND OF BROCA.

Brian Thomas Hawkins and Steven L. Bealer, The University of Tennessee at Memphis, Memphis, Tennessee. We summarize the results of a study to determine the physiological mechanism of control behind the baroreflex response. The Diagonal Band of Broca brain region, which is believed to be involved in that mechanism, was manipulated surgically and chemically to determine its role in the control of the baroreceptors. The data presented support the hypothesis that the Diagonal Band of Broca is a major contributor to that control mechanism.

GENETIC BREEDING TECHNIQUES OF *ANTHONOMUS GRANDIS*, BOH.

Shambria F. Haynie, Harold R. Bancroft, and Charles J. Biggers, The University of Memphis, Memphis, Tennessee. The objective of this research was to attempt to describe genetic-mating techniques in the cotton boll weevil (*Anthonomus grandis*, Boh.). Weevils are mass-reared at the Gast Boll Weevil Rearing Laboratory at Mississippi State University. However, no one has described a procedure for mating single pairs of boll weevils in the laboratory for genetic studies. We have attempted to answer a number of the problems which one meets in single-pair matings. Such problems as "safe" period for mating, obtaining virgin females, egg collection, sex determination, mold inhibition, and adult-larval media are discussed. Boll weevils were obtained from hybridizing the Mississippi State laboratory weevil with feral weevils from Fayette Co., Tennessee. Weevils were maintained at room temperature in disposable petri dishes on No. 1 Whatman filter paper. A comparison of ability to hatch was made between laboratory weevils and hybrid weevils.

A QUEST TO PROVE THE GOLDBACH CONJECTURE TRUE.

De'Marko Thurman, Lane College, Jackson, Tennessee. A problem that was well known in number theory was one known as the Goldbach conjecture. The Goldbach conjecture was an unproven conjecture that stated that every even number except two was equal to the sum of two prime numbers. The Goldbach conjecture took the formula form of $2n = p + 1$ where p was less than or equal to q and was studied in numeric form. This formula had been proven only for all even numbers up to 2×10^{10} . The focus of my research was an attempt to prove the Goldbach conjecture true for all even numbers except two. By analyzing the Vinogradov method, the methods of estimating trigonometric sums involving prime numbers, other concepts and analyzations from other mathematicians such as A. A. Karatsuba, we spent the last 2 years of research collecting data and theories that would contribute to my quest to prove the Goldbach conjecture true.

LOCALIZATION OF MONOCLONAL ANTIBODIES IN MESODERM AND ENDODERM CULTURES OF CHICK EMBRYO HEART.

Nicole Nall, David L. Bolender, and Kathy McCormick, Lane College, Jackson, Tennessee (NN), and Medical College of Wisconsin, Milwaukee, Wisconsin (DLB, KM). In this study, we used monoclonal antibodies specific to titin and type I procollagen to analyze the extent of early heart development in co-cultures of mesoderm and endoderm. The heart region of chicken embryos between Hamburger and Hamilton stages 9 and II was cryopreserved with 20% sucrose to preserve morphology and cross-sectioned on a cryostat. The stage-10 embryos were immunostained with monoclonal antibodies, 9D10, specific to titin, and M-38, specific to type I procollagen. Co-cultures

of precardiac (stage 6) anterior hydrated collagen, in which the medium was changed daily, were immunostained with 9D10 and M-38. Culture results were compared to in-vivo staining of stage-10 embryos. In stage-10 embryos, the myocardium of the atrium and ventricle was intensely positive after staining with antibodies for titin. Immunoreactivity for M-38 also was localized in the myocardium but with less intensity than that seen with titin. In the culture, the myocardial precursor cells within the mesoderm were intensely positive after staining with antibodies for titin. Immunoreactivity for M-38 also was localized in the mesoderm but in fewer cells than that seen with titin. Positive staining was never observed in the endoderm, endothelium, or any other tissue of the heart and suggests that collagen and titin are some of the first molecules produced by differentiating myocytes. Because titin was observed only in pulsating, differentiating cardiac myocytes in the endoderm-mesoderm co-cultures, it should be useful as a distinct marker for cardiac myocyte differentiation in further studies using culture bioassay to determine effects of endoderm-derived proteins on heart development.

M. C. ESCHER: REGULAR DIVISION OF THE PLANE.

Luke Rawlings, Christian Brothers University, Memphis, Tennessee. M. C. Escher's drawings involving the regular division of the plane provide collective evidence of many explored questions about plane tilings and beg mathematicians to examine their ingrained assumptions about the methods of analysis and creation of colored plane tilings. Escher's drawings can be used to give visual expression to abstract concepts of group theory. His drawings also show how mathematics and art are very well related. This study involved an in-depth look at symmetry, isometries, topological transformation, and creativity in math.

ELECTROPHORETIC ANALYSIS OF ESTERASE AND ALDEHYDE OXIDASE ENZYMES DURING DEVELOPMENT OF *ANTHONOMUS GRANDIS*.

Andryan A. Emion and Charles J. Biggers, The University of Memphis, Memphis, Tennessee. Polyacrylamide-gel electrophoresis was used to separate the esterase and aldehyde oxidase enzymes of six stages of development of the cotton boll weevil (*Anthonomus grandis*). The enzymes were fractionated for 2 h on a 5.5% gel with Peacock buffer of pH 8.6, a constant voltage of 300 volts, and a controlled temperature of 5°C. A sample of 20 μ l of whole-body squash in a saturated solution of sucrose and buffer was used. Bromophenol was added to the sample and used as a tracking dye. The gels were sliced horizontally into two slabs and stained separately for esterase and aldehyde oxidase. A comparison of the two enzymes in the different developmental stages was made.