# MATHEMATICAL ASSOCIATION OF AMERICA

## Official Reports and Communications

### MAY MEETING OF THE ROCKY MOUNTAIN SECTION

The fiftieth annual meeting of the Rocky Mountain Section of the MAA was held at Western State College, Gunnison, Colorado, on Friday and Saturday, May 12 and 13, 1967.

There were 95 people registered for the meeting including Professor F. M. Stein of Colorado State University, Sectional Governor, and Professor W. E. Dorgan of Western State College, Section Chairman.

The invited address was delivered on Friday afternoon by Dr. John Gary, National Center for Atmospheric Research, Boulder, Colorado. He spoke on "Large Scale Numerical Simulation of Atmospheric Processes."

Professor W. E. Dorgan presided at the banquet Friday night. The Section was welcomed by Dean D. H. Cummins, Dean of Faculties of Western State. Following the banquet mathematical movies were shown.

The following 16 papers were presented at the meeting:

1. *Semi-continuity and linear transformation*, by J. A. Jensen, University of Wyoming.

This paper presents several theorems which show that, with appropriate conditions on the topological spaces, if a function is semicontinuous, then it is continuous.

2. *Some equations in a finite field*, by A. D. Porter, University of Wyoming.

3. *On a cyclide and its associated circular cubic*, by N. X. Vinh, University of Colorado.

This paper discusses the cyclide defined by the equation $y(x^2+y^2+z^2) = a^2x$ and the circular cubic, intersection of the surface and the plane $z = 0$. The cyclide contains three real and two imaginary families of circles. They are the intersections of the surface and the families of spheres having their centers on the $xy$ plane, and on two paraboloids of revolution. Properties of the circular cubic were derived and its connections with the lemniscate of Bernoulli and the rectangular hyperbola were shown.

4. *A note on a class of generating functions*, by J. E. Faulkner, Brigham Young University.

5. *Some results on the Mikusiński convolution ring*, by Daryl Kreiling and S. Johnson, University of Wyoming.

It is shown that the Mikusiński convolution ring $C$ is a Jacobson radical ring in which the descending chain condition on ideals does not hold. It is also shown that $C$ can be expressed as a subring of the direct sum of some family of rings and that $C$ has a family of ideals whose intersection is the zero ideal. Such a representation and family of ideals is given.

6. *Some results on the number of rings of order n*, by Clyde Martin and A. D. Porter, University of Wyoming.

It is shown that the number of rings of order $n$ may be obtained by determining the number of rings of prime power order. An upper bound for rings of order $p^a$, $p$ prime, is then obtained. A second approach to the problem shows that finding the number of rings of order $p^a$ is equivalent to determining the number of solutions to a certain set of $n^3$ congruences.

7. *Similarity and orthogonal similarity in a finite field*, by John Adams and A. D. Porter, University of Wyoming.

Classical results for similarity, orthogonal similarity, and unitary similarity of square matrices over the real and complex fields are paralleled in finite fields. Necessary and sufficient conditions are given for these relations to hold between certain classes of square matrices and diagonal matrices.

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8. *Matrix notations for the Taylor series expansion*, by C. A. Halijak, University of Denver.

9. *The mathematics program at the USAF Academy*, by Lt. Colonel R. C. Rounding, USAF Academy.

10. *Evaluation and placement system at the USAF Academy*, by Colonel Archie Higdon, USAF Academy.

11. *A survey course for business majors*, by H. H. Frisinger, Colorado State University.

12. *Criteria for positive definiteness of large multi-diagonal matrices*, by E. L. Allgower, Colorado State University.
The approach is to seek conditions on the elements such that sequences of symmetric multi-diagonal matrices obtained by bordering are positive definite independent of the size. Such sequences of matrices are also characterized in terms of monotonicity of the sequences of the corresponding matrices having 1's down the main diagonal. This result is related to the nature of the solutions of the recursion or difference equations which describe the determinants of multi-diagonal type matrices.

13. *Robust estimation of location I*, by E. L. Crow, Environmental Science Services Administration, Boulder, Colorado, and M. M. Siddiqui, Colorado State University.

14. *Robust estimation of location II*, by M. M. Siddiqui, Colorado State University, and E. L. Crow, Environmental Science Services Administration, Boulder, Colorado.

15. *Recurrency in the integer solutions of quadratic equations*, by E. I. Emerson, Boulder, Colorado.

16. *Some investigations on partially balanced arrays*, by D. V. Chopra, Southern Colorado State College.

At the business meeting, which was held on Saturday morning, May 13, with Professor Dorgan presiding, the following officers were elected for 1967/68:
Chairman—Kenneth Noble, University of Denver; Vice-Chairman—Jerrold Bebernes, University of Colorado; Secretary-Treasurer—C. R. Wylie, Jr., University of Utah.

W. N. SMITH, *Secretary-Treasurer*

## OCTOBER MEETING OF THE OHIO SECTION

A special meeting of the Ohio Section of the MAA was held on October 20–21, 1967, at Stouffer's University Inn, Columbus, Ohio. This was a joint meeting of the Ohio Section and the Committee on the Undergraduate Program in Mathematics (CUPM) and was entitled "Conference on Collegiate Mathematics in Ohio." Professor Daniel Finkbeiner, Chairman of the Section, and Professors Arnold Ross and H. D. Lipsich presided at the general sessions. There were two hundred and eight registered in attendance including one hundred fifty-four members of the Association.
The following program was presented:

1. *A Brief Survey of CUPM Activities*, by R. D. Anderson, Louisiana State University, Chairman, CUPM.
This talk discussed the current status of CUPM's activities, particularly in the areas of the Teacher Training Panel, the College Teacher Preparation Panel, the Panel on Two Year Colleges, and the three panels on Applications of Mathematics: the Panel on Mathematics in the Life Sciences, the Panel on Computing, and the Panel on Statistics.

2. *A General Curriculum in Mathematics for Colleges*, by G. B. Price, University of Kansas.