THE APRIL MEETING OF THE ROCKY MOUNTAIN SECTION

The twentieth regular meeting of the Rocky Mountain Section was held at the University of Denver, Denver, Colorado, on April 17–18, 1936. There were three sessions. Professor A. W. Recht presided at each.

The attendance was forty-one, including the following twenty-five members of the Association: L. A. Aroian, Jack Britton, Sister Rose Margaret Cook, W. D. Dickinson, Jr., J. R. Everett, J. C. Fitterer, G. W. Gorrell, D. F. Gunder, I. L. Hebel, C. A. Hutchinson, L. Louise Johnson, A. J. Kempner, Claribel Kendall, A. J. Lewis, W. V. Lovitt, S. L. Macdonald, A. E. Mallory, A. S. McMaster, W. K. Nelson, Greta Neubauer, E. D. Rainville, O. H. Rechard, A. W. Recht, C. H. Sisam, W. M. Stewart.

Professor A. E. Mallory, Colorado State College of Education, was elected chairman for the coming year. Professor C. A. Hutchinson, University of Colorado, was elected vice-chairman.

The following papers were read:

1. "Thiele's semi-invariants and their application to problems in statistics" by Professor L. A. Aroian, Colorado State College.

2. "The separation of the roots of the trinomial equation" by Professor A. J. Lewis, University of Denver.

3. "Theorems on a classical heat problem" by E. D. Rainville, United States Bureau of Reclamation.

4. "On the determination of the coefficients of the Kreisteilungs-Gleichung" by Professor A. J. Kempner, University of Colorado.

5. "Four notes on the solution of systems of linear matrix equations in two and three unknowns" by Professor O. H. Rechard, University of Wyoming.

6. "The mathematics of ancient China" by Professor I. L. Hebel, Colorado School of Mines.

7. "Pohlke's theorem in four dimensions" by Professor C. H. Sisam, Colorado College.

8. "The analytic discussion of the locus of the radical center of three circles related to a triangle" by W. M. Stewart, University of Wyoming.

9. "The projective generation of curves and surfaces" by Professor Claribel Kendall, University of Colorado.

Abstracts of the papers and discussions follow below, the numbers corresponding to the numbers in the list of titles:

1. The main properties of semi-invariants were derived by Professor Aroian and applied to the following types of distributions: normal, binomial, Poisson, and Pearson type III. The results were further applied to the Gram-Charlier distribution, and to the problem of the distribution of means in samples of N from an infinite population. The exposition was based on class notes of Professor C. C. Craig.

2. In this paper Professor Lewis shows a method of separating the roots of

a trinomial equation by dividing concentric rings, having the origin of the complex plane as center, into equal sections each containing just one root of the given equation.

3. Mr. Rainville considered what may be a new solution for the problem of the conduction of heat in an infinite slab initially at a constant temperature and with its surfaces held thereafter at a different constant temperature. The newer solution presents marked advantages for purposes of extensive computations as compared to the classical solution of Fourier.

4. A very simple mechanical rule was established by Professor Kempner for the determination of the coefficients of the irreducible Kreisteilungs-Gleichung.

5. In 1933 Miss Achenbach presented a method for finding the unique solution of each of the sixteen systems of linear matrix equations which may be obtained from the system $A_iX+B_iY=C_i(i=1, 2)$, by permitting the coefficients A_i, $B_i(i=1, 2)$ to be transferred from left to right-hand multipliers of their respective unknowns in all possible combinations one, two, three, and four at a time. In solving the simple system in which all the coefficients are on the left, she included among the restrictions on the system that the matrices A_i, B_i $(i=1, 2)$ be non-singular. Professor Rechard presented four notes concerning this system of equations.

Note I shows that a solution of the system can be found even if one of the four coefficients is singular. Note II establishes in general a solution, other than the trivial one in case C_1 and C_2 are both zero. Note III points out the fact that the sixteen systems treated are all special cases of the general one, $A_iXB_i+C_iYD_i=E_i(i=1, 2)$. This inclusive system yields to the method employed to solve the fourteen systems in which all the coefficients are not on the same side of the unknowns. In Note IV the solution for a system in three unknowns, in which the coefficients are all on the same side of their respective unknowns, is developed under suitable restrictions on the singularity of the matrices involved.

6. To compare the mathematical development of early China with that of other nations, the ancient "Arithmetic in Nine Sections" was reviewed by Professor Hebel. He gave the mensuration rules of the early Chinese and their processes for the manipulation of fractions and the solution of certain systems of equations in more detail than is given in the usual mathematical histories, thus establishing the Chinese among the pioneers in mathematical science.

7. Pohlke's theorem, in four dimensions, was discussed by Professor Sisam. This theorem can be stated as follows: Let OP_i $(i=1, 2, 3, 4)$ be any four given line segments originating at 0 and lying in a space π of three dimensions. There exist four equal, mutually orthogonal segments $O^*P_i^*$, lying in a four dimensional space that contains π, from which the given segments may be obtained by a sequence of (at most) two parallel projections of which the first projects the four orthogonal segments on a three-space π' and the second is orthogonal to π'.

8. Mr. Stewart discussed the following locus problem: Let a general triangle with the vertices A, B and C, and the opposite sides a, b and c respectively, be considered. Let any straight line l intersect the sides, or the sides extended, in the finite points a', b' and c' respectively. Then let three circles be drawn; the first with center at A and radius Aa'; the second with center at B and radius Bb'; and the third with center at C and radius Cc'. Determine the locus of the radical center of these three circles, as the line l rotates about a finite fixed point (x_j, y_j), and the asymptotes of this locus and find the locus of this radical center when the point (x_j, y_j) moves to infinity in various directions. Results were obtained by elementary methods for the general situation and certain limiting cases.

9. In this expository paper Professor Kendall discussed in some detail the projective generation of point-rows of the second order from two non-concentric, non-perspective pencils of lines lying in the same plane, and the dual problem concerning sheaves or pencils of rays of the second class, these loci being identified with our ordinary curves of the second order. Following this she discussed the generation of curves of the third order formed from the points of intersection of corresponding rays of a sheaf of rays of the first order projective to a sheaf of rays of the second order. Brief mention was made of the extension of these methods of generating curves of higher order and of generating surfaces.

A. J. LEWIS, *Secretary*

THE SPRING MEETING OF THE MARYLAND-DISTRICT OF COLUMBIA-VIRGINIA SECTION

The spring meeting of the Maryland-District of Columbia-Virginia Section of the Mathematical Association of America was held at the United States Naval Academy, Annapolis, Maryland, on Saturday, May 9, 1936. The Chairman, Professor G. T. Whyburn, of the University of Virginia, presided over both sessions, morning and afternoon. Commander J. A. Logan, executive officer and acting head of the Post-graduate School of the U. S. Naval Academy, officially welcomed the members and their guests. Five papers were presented at the morning session, while in the afternoon, at the invitation of the Section, Professor Tobias Dantzig of the University of Maryland delivered a lecture entitled "Some curious aspects of mathematical history."

The attendance was sixty-nine including the following forty-three members of the Association: O. S. Adams, N. H. Ball, C. C. Bramble, Paul Capron, Randolph Church, G. R. Clements, Abraham Cohen, A. E. Currier, J. H. Curtiss, Alexander Dillingham, J. A. Duerksen, P. J. Federico, Michael Goldberg, Harry Gwinner, F. E. Johnston, L. M. Kells, W. D. Lambert, A. E. Landry, C. L. Leiper, S. B. Littauer, G. A. Lyle, Carol V. McCamman, E. J. McShane, Ruth G. Mason, Florence M. Mears, T. W. Moore, F. D. Murnaghan, J.L. Nagle, Walter Penney, C.H. Rawlins, A.W. Richeson, R.E. Root,