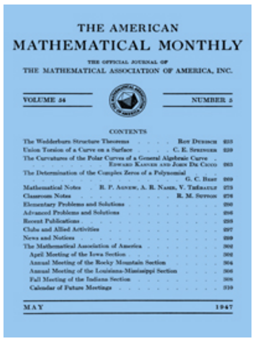

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FALL MEETING OF THE INDIANA SECTION

The twenty-fourth annual meeting of the Indiana Section of the Mathematical Association of America was held at Indiana State Teachers College, Terre Haute, Indiana, on Friday, October 18, 1946, in conjunction with the fall meeting of the Indiana Academy of Science. Professor W. L. Ayres presided.

Thirty-four persons registered at the meeting, including the following sixteen members of the Association: W. L. Ayres, Juna L. Beal, W. H. Carnahan, G. E. Carscallen, Olive M. Draper, W. E. Edington, P. D. Edwards, Rufus Isaacs, M. W. Keller, J. P. LaSalle, P. M. Pepper, J. C. Polley, M. E. Shanks, W. O. Shriner, F. C. Smith, and C. P. Sousley.

At the business meeting the following officers were elected for the coming year: Chairman, G. H. Graves, Purdue University; Vice-chairman, H. E. Wolfe, Indiana University; Secretary-Treasurer, M. W. Keller, Purdue University. It was decided to hold a spring meeting in 1947 at a time and place to be determined by the officers.

The following papers were read:

1. *The American University at Shrivenham Barracks*, by Professor P. D. Edwards, Ball State Teachers College.

Shrivenham American University, although created by army personnel awaiting redeployment, was a true American University operated on foreign soil. The faculty of more than 220 members represented 149 American institutions of higher education. About 150 were civilians who were sent to England for this purpose. The University was divided into eight sections which correspond to the usual division of an American university into schools. The faculty of the mathematics branch included fourteen civilians and seven members of the army, all of whom were college teachers in civil life. The enrollment was approximately 4000 each term. Approximately three-fourths of the student body had had actual combat experience. An elective system prevailed, and under it the mathematics branch was exceeded in size by only one other branch. In spite of the unusual difficulties which prevailed, very gratifying results were obtained.

2. *The American University at Biarritz*, by Professor J. C. Polley, Wabash College.

The speaker discussed the mathematics program in the American University at Biarritz, and his experiences while there.

3. *Applications of the linear transformation*, by Professor J. P. LaSalle, Notre Dame University.

Several applications of the linear transformation $(az+b)/(cz+d)$ to problems in electrical engineering were presented by Professor LaSalle. A clear geometric picture of the variation of power transfer to a load with change of load or generator impedance, and of the condition for maximum power transfer, was obtained by means of the transformation $(1-z)/(1+z)$. The "circle" diagram which relates impedance to the reflection coefficient can be used for this purpose. Though the concepts of reflection and transmission coefficients appear to be more natural than those of impedance and the resulting equivalent circuits, particularly for wave guides, only limited use of the former concepts have been made. This may be due to difficulties in applying the general linear transformation. Algebraic identities which simplify the application of this transformation were given.

4. *The force of mortality function*, by Dr. F. C. Smith, Lincoln Life Insurance.

In this paper, the author discussed the definition of the force of mortality function μ, and some of its properties. Several methods of approximating the values of this function were also presented. The importance of this function in the field of actuarial mathematics was stressed, and the effects of assuming the Gompertz and Makeham hypotheses were shown.

5. *Recent progress in the theory of compressible fluids*, by Professor Rufus Isaacs, Notre Dame University.

Recent developments make the need for a workable theory of compressible fluids imperative. In the past, progress has been checked, first, by the complexity of the theory, and, second, by the formidable amount of numerical computation needed to apply what theory is extant. The new approach of Bergman to the methods of Chaplygin now yields a usable theory when used in conjunction with such modern computational devices as the Aiken machine at Harvard University. A research program under Professor Von Mises is now under way at Harvard.

In two-dimensional incompressible flows, the stream function (a function whose values completely determine the flow) satisfies the Laplace equation. Thus each flow pattern can be determined from an analytic function of a complex variable by taking the imaginary part. In distinction, for compressible fluids the differential equation satisfied by the stream function is non-linear. But Chaplygin showed that in the hodograph plane (where the velocity components are the independent variables) the equation becomes linear although complicated. Bergman has developed an operator for this equation, wherein a flow can again be obtained for each analytic function. This operator requires knowledge of a certain function sequence which may be (and now is being) calculated once and for all. With this apparatus, all flow patterns may be obtained with comparatively little labor.

6. *The achievement of large classes in mathematics* (preliminary report), by Professors H. F. S. Jonah, and M. W. Keller, Purdue University.

The authors discuss in this paper the achievement of large classes in mathematics in comparison with achievement of small classes, as measured by uniform objective tests. These preliminary results indicate that for mature groups and selected instructors, large classes are as effective as small classes for teaching algebra and trigonometry.

7. *Hodograph methods for compressible flow*, by Professor M. E. Shanks, Purdue University.

Professor Shanks discussed the types of hodographs obtainable from flow past an airfoil, and pointed out problems unsolved even for incompressible flows. The case of supersonic flows and the method of characteristics were also discussed.

8. *Engineering applications of spherical trigonometry*, by Professor P. M. Pepper, Notre Dame University.

In this paper Professor Pepper describes some of the engineering applications of spherical trigonometry. Since its inception, spherical trigonometry has been applied principally to the sciences of astronomy, geodesy and navigation. It is little known that spherical trigonometry can be useful to the tool engineer, first, to derive the usual formulas for "compound angles" and, second, to solve atypical problems of this nature. Certain of the compound angle formulas are identified with Napier's rules for right spherical triangles, whereas certain of the nonstandard problems lead to the laws of oblique spherical triangles.

M. W. KELLER, *Secretary*

CALENDAR OF FUTURE MEETINGS

Twenty-ninth Summer Meeting, New Haven, Conn., September 1–2, 1947.
Thirty-first Annual Meeting, Athens, Georgia, January 1, 1948.

The following is a list of the Sections of the Association with dates of future meetings so far as they have been reported to the Secretary.

ALLEGHENY MOUNTAIN
ILLINOIS
INDIANA
IOWA
KANSAS
KENTUCKY
LOUISIANA-MISSISSIPPI
MARYLAND-DISTRICT OF COLUMBIA-VIRGINIA
METROPOLITAN NEW YORK
MICHIGAN
MINNESOTA
MISSOURI
NEBRASKA
NORTHERN CALIFORNIA, Berkeley, January 24, 1948
OHIO
OKLAHOMA
PACIFIC NORTHWEST
PHILADELPHIA, Bryn Mawr, November 29, 1947
ROCKY MOUNTAIN
SOUTHEASTERN
SOUTHERN CALIFORNIA, Redlands, March 13, 1948
SOUTHWESTERN
TEXAS
UPPER NEW YORK STATE
WISCONSIN, Madison, May, 1947