The Fall Meeting of the Indiana Section

M. W. Keller (Secretary)

year would apparently compare favorably with the budget items as estimated at the beginning of the year.

Letters were read from several members protesting against the holding of sessions of the Association on Sunday. No action was taken on the question; but in the discussion the opinion was expressed that such Sunday sessions were necessitated by war conditions, and that there was no intention to continue the practice after the present emergency.

It was voted, on the request of the Secretary-Treasurer, to have a thorough audit of the accounts of the Association at the end of the year, the Finance Committee to arrange for such an audit.

H. M. Gehman of the University of Buffalo was elected a member of the Finance Committee for a term of four years to succeed R. E. Langer.

The Editor-in-Chief nominated and the Board elected the following associate editors of the MONTHLY for the year 1944:

E. F. BECKENBACH	H. P. EVANS	M. R. HESTENES
L. M. BLUMENTHAL	B. F. FINKEL	B. W. JONES
N. B. CONKWRIGHT	J. S. FRAME	R. E. LANGER
H. S. M. COXETER	ORRIN FRINK, JR.	C. V. NEWSOM
W. M. DAVIS	MARJORIE GROVES	VIRGIL SNYDER
OTTO DUNKEL		MARIE J. WEISS

At the meeting on Sunday, R. E. Langer was nominated to succeed T. C. Fry as the representative of the Association on the National Research Council for a term of three years beginning July 1, 1944.

ANNUAL BUSINESS MEETING

The annual business meeting of the Association was held on Sunday morning at 9:30, President Cairns presiding.

The results of the election of officers were announced as follows:

First Vice-President for the term 1944–45: W. M. Whyburn, University of California at Los Angeles.

Governors at Large for the term 1944–46: R. G. Sanger, University of Chicago, and Morgan Ward, California Institute of Technology.

W. B. CARVER, Secretary-Treasurer

THE FALL MEETING OF THE INDIANA SECTION

The twenty-first annual meeting of the Indiana Section of the Mathematical Association of America was held at Butler University, Indianapolis, Indiana, on Friday, October 29, 1943, in conjunction with the fall meeting of the Indiana Academy of Science. Professor P. M. Pepper, Chairman of the Indiana Section of the Association, presided at the morning session, and Professor W. E. Edington, Chairman of the Mathematics Section of the Academy, presided at the afternoon session.

Forty-three individuals registered at the meetings, including the following

twenty-five members of the Association: Emil Artin, W. L. Ayres, K. W. Crain, J. E. Dotterer, W. E. Edington, P. D. Edwards, Michael Golomb, G. H. Graves, Cora B. Hennel, M. W. Keller, E. L. Klinger, Gladys B. McColgin, H. A. Meyer, G. T. Miller, Paul Muehlman, P. M. Pepper, J. C. Polley, Maxwell Reade, D. A. Rothrock, C. P. Sousley, M. S. Webster, J. W. Wiley, K. P. Williams, H. E. Wolfe, A. J. Zanolar.

At the business meeting the following officers were elected for next year: Chairman, Emil Artin, Indiana University; Vice-Chairman, W. L. Ayres, Purdue University; Secretary, M. W. Keller, Purdue University. It was decided to hold the next meeting in conjunction with the annual meeting of the Indiana Academy of Science.

The following papers were presented:

1. *Isohedral polyhedra*, by Leon Alaoglu and Dr. J. H. Giese, Purdue University, introduced by Professor W. L. Ayres.

In this paper isohedral and isogonal polyhedra were defined, and it was indicated that the classical regular polyhedra are both isohedral and isogonal. Attention was then directed to polyhedra which are isohedral, but which have isogonality replaced by the weaker property that equal numbers of faces meet at the vertices. It was pointed out that for finite polyhedra of genus zero (topological spheres) the Euler polyhedron formula reduces the possibilities to the usual five, ranging from tetrahedron to icosahedron. Constructions using the greatest possible numbers of unequal edges per face were devised to show the existence of all of these five types except the icosahedron with scalene triangular faces. In the case of genus one (topological tori) the Euler formula reduces the possibilities to triangular, quadrilateral, and hexagonal faces. Constructions were devised to establish the existence of isohedral tori with $12n$ ($n \geq 3$) triangular faces, and of isohedral tori with $8n$ ($n \geq 4$) quadrilateral faces.

2. *The elementary functions*, by Professor Emil Artin, Indiana University.

Professor Artin showed how to introduce the elementary functions e^x, log x, cos x and sin x in a completely rigorous manner by using only the simplest facts relating to limits. The results thus obtained cover all properties of these functions, including the infinite product for sin x. It is thus possible to have all these functions available from the beginning in a course in advanced calculus.

3. *A method for the solution of algebraic or transcendental equations*, by Dr Michael Golomb, Purdue University.

The speaker pointed out that the familiar methods for the solution of equations have certain shortcomings. (Newton's and Horner's methods apply only to real roots, while Graeffe's method applies only to algebraic equations, *etc.*) He derived a new method based upon Hadamard's investigations of the singularities of functions defined by Taylor series. The symmetric functions of the zeros of smallest absolute value were given as limits of quotients of persymmetric determinants involving successive coefficients in the Maclaurin expansion of the reciprocal of the function.

4. *Some developments in the analytic theory of continued fractions*, by Dr. Marion Wetzel, Indiana University, introduced by Professor K. P. Williams.

This address dealt with certain recent contributions to the analytic theory of continued fractions. These contributions have attempted to bring together many isolated results, and fit them into a larger analytic structure. The speaker regarded the continued fraction as an infinite sequence of linear fractional transformations in the complex plane. The class of continued fractions

$$\frac{1}{b_1 + z} - \frac{a_1^2}{b_2 + z} - \frac{a_2^2}{b_3 + z} - \cdots, \ (a_p \neq 0)$$

for which the quadratic form

$$\sum_{p=1}^{n} \Im(b_p + Z)X_p^2 - 2\sum_{p=1}^{n-1} \Im(a_p)X_p X_{p-1}$$

is positive definite for all values of $\Im(z) > 0$ was discussed. These continued fractions include the classical case in which $\Im(b_p) = \Im(a_p) = 0$, and also the case $\Im(b_p) \geqq 0$, $\Im(a_p) = 0$, discussed in a paper by Hellinger and Wall in the *Annals of Mathematics*, vol. 44, 1943, pp. 103–127. Necessary and sufficient conditions for positive definiteness in terms of the imaginary parts of the coefficients in the quadratic form were given. The speaker cited some applications of this characterization, including connections with theorems on convergence regions.

5. *Remarks on surfaces*, by Professor J. W. T. Youngs, Purdue University, introduced by Professor M. W. Keller.

Professor Youngs made some expository comments on classical and modern surface theory.

The afternoon session was devoted to a panel discussion of the mathematics training offered for the armed forces in Indiana colleges. The following topics were brought before the meeting:

I. *The content of A. S. T. P. courses with special attention to the relegation of theory to a place of minor importance*, by Professor W. L. Ayres, Purdue University.

II. *Standards for the retention of men in the A. S. T. P.*, by Professor K. P. Williams, Indiana University.

III. *Content of the V-12 program (excluding navigation)*, by Professor J. C. Polley, Wabash College.

IV. *Navigation in the V-12 program*, by Professor R. F. McDaid, Indiana State Teachers College.

V. *Content of courses in the advanced navy program in light of the preparation of the students enrolled*, by Professor Paul Pepper, University of Notre Dame.

VI. *Army pre-flight courses*, by Professor J. L. Beal, Butler University.

VII. *Navy pre-flight courses*, by Professor W. E. Edington, DePauw University.

VIII. *Navy primary and secondary flight courses*, by Professor P. D. Edwards, Ball State Teachers College.

M. W. KELLER, *Secretary*

CALENDAR OF FUTURE MEETINGS

Twenty-Seventh Summer Meeting, Wellesley, Mass., August 12–14, 1944.

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, Pittsburgh, Pa., April, 1944

ILLINOIS, Normal, Ill., May 12–13, 1944

INDIANA, Indianapolis, November 10, 1944

IOWA, Cedar Rapids, April 15, 1944

KANSAS

KENTUCKY

LOUISIANA-MISSISSIPPI

MARYLAND-DISTRICT OF COLUMBIA-VIRGINIA

METROPOLITAN NEW YORK, New York, April 22, 1944

MICHIGAN, Ann Arbor, March 18, 1944

MINNESOTA

MISSOURI

NEBRASKA, Lincoln, May 6, 1944

NORTHERN CALIFORNIA

OHIO, Columbus, April 6, 1944

OKLAHOMA

PHILADELPHIA, Philadelphia, November, 1944

ROCKY MOUNTAIN, Greeley, Colo., April 14–15, 1944

SOUTHEASTERN

SOUTHERN CALIFORNIA, Los Angeles, March 11, 1944

SOUTHWESTERN

TEXAS

UPPER NEW YORK STATE

WISCONSIN, Milwaukee, May, 1944