May Meeting of the Indiana Section

M. W. Keller (Secretary)

outside applications than is the underlying theory. In the case of arithmetic, it is necessary to teach technique to children who are too young to appreciate theoretic considerations. The decimal system of notation is regarded by most people as something established by divine decree, rather than as a result of biological accident. With only the most elementary algebraic concepts, one can approach an understanding of arithmetic through a study of the four fundamental operations as they might be developed by creatures with eight or twelve (and so on) fingers instead of ten. One can then proceed to justify these techniques in terms of a general base. Other arithmetical devices, similarly studied, lead to amusing elementary consequences.

5. *The present mathematical situation and next steps in the teaching of mathematics*, by Dr. William Betz, Rochester, N. Y.

The speaker stated that the mathematical scene is still characterized by a confusion of aims, of content, and of organization. The fundamental thesis of the educator is that "academic" mathematics of the usual type is largely "non-functional," and that it does not "meet the needs" of the vast majority of our young people. The real cause of the present breakdown must be located in a widespread educational opportunism which is without an adequate philosophy in dealing with the problems of mass education. Among the most obvious steps needed to correct the present situation are the following: a nation-wide publicity campaign exposing the folly and danger of current policies; a clear and authoritative analysis of the real meaning of "functional competence in mathematics"; the general adoption of a "two-track program" in secondary mathematics; the planning of a continuous curriculum in secondary mathematics, which shall give due attention to understanding, significant application, and mastery.

6. *Panel discussion: Some problems relating to mathematics in New York Colleges*, by Professor Wladimir Seidel, the University of Rochester, Chairman; Professor J. M. Synnerdahl, Canisius College; Professor K. E. Bush, Mohawk College; Professor D. E. Kibbey, Syracuse University.

Several problems of the urban college were enumerated by the first speaker. Mr. Bush described several of the courses of instruction in mathematics in the Associated Colleges of Upper New York. He stated that engineering seemed to be the preferred field, and that about three-quarters of the students were studying mathematics. He outlined a number of problems which may arise when the students transfer to other institutions. Dr. Kibbey pointed out that the Associated Colleges and the branch colleges of Syracuse University will feed more students into the advanced courses of the established institutions, and increase the present demand for competent instructors; he predicted enlarged enrollments in such courses as advanced calculus, and raised the question of whether these courses meet the needs of students. Finally, Professor Kibbey discussed the possibility of teaching beginning students some of the fundamental concepts of mathematics to give them some sense of the structure of the science. A general discussion followed.

C. W. MUNSHOWER, *Secretary*

MAY MEETING OF THE INDIANA SECTION

The spring meeting of the Indiana Section of the Mathematical Association of America was held at Purdue University, Lafayette, Indiana on May 16–17, 1947. On Friday evening sixty members and guests attended a dinner in honor of President and Mrs. L. R. Ford. After the dinner Professor Ford gave a lecture entitled *Some Remarkable Theorems About Areas*.

Eighty-one persons attended the meetings, including the following thirty members of the Association: W. L. Ayres, L. G. Black, Stanley Bolks, I. W. Burr, G. E. Carscallen, K. W. Crain, P. D. Edwards, L. R. Ford, E. L. Godfrey,

Michael Golomb, G. H. Graves, W. R. Hardman, C. T. Hazard, H. K. Hughes, Rufus Isaacs, H. F. S. Jonah, M. W. Keller, E. L. Klinger, M. M. Lemme, F. C. Leone, G. T. Miller, P. M. Nastucoff, Ivan Niven, P. M. Pepper, J. C. Polley, C. K. Robbins, M. E. Shanks, L. S. Shively, R. B. Stone, M. S. Webster, K. P. Williams.

Professor G. H. Graves, Chairman, presided at the business meeting. Professor P. M. Pepper, Notre Dame, was elected Secretary-Treasurer to succeed Professor M. W. Keller who resigned after serving for six years. It was decided to hold a fall meeting again on October 17, 1947 at Ball State Teachers College, Muncie, Indiana, in conjunction with the fall meeting of the Indiana Academy of Science.

The following papers were presented:

1. *Geometries and their terminology*, by Sister Gertrude Marie, O.S.F., Marian College.

In this discussion the speaker traced in parallel the evolution and naming of the various types of geometry, and the history and significance of the names. The purpose of the study was to contribute to an evaluation of current geometric terminology on scientific and linguistic grounds.

2. *A five significant figure slide rule for plane and spherical trigonometry*, by Professor P. M. Pepper, University of Notre Dame.

Professor Pepper demonstrated a slide rule for performing the computations of plane and spherical trigonometry with an accuracy comparable to that obtained by using five-place logarithmic tables. Besides performing all the usual operations, the speaker illustrated how the rule could be used as a five-place table of reciprocals of numbers, of natural trigonometric functions, of logarithms of numbers, and of logarithms of the trigonometric functions.

3. *A simple proof that π is irrational*, by Professor Ivan Niven, Purdue University.

The results obtained in this paper were published in *The Bulletin of the American Mathematical Society*, vol. 53, p. 509.

4. *Remarks on the construction of tables of functions*, by R. D. Gordon, Indiana University, introduced by Professor K. P. Williams.

The speaker discussed briefly the principal devices which make possible the constuction of finite tables so as to accommodate "infinitely many" possible calculations. He also indicated how this subject could be introduced in elementary courses.

5. *A congruence on the sums of powers*, by Gordon Overholtzer, Indiana University, introduced by Professor M. W. Keller.

The methods of investigation of the Schur derivate of a sequence were applied to the summation of the kth powers (k being any integer) of the integers from 1 to p^n (p an odd prime) in a single residue class modulo p.

6. *Functional iterates of half-order*, by Professor Rufus Isaacs, University of Notre Dame.

Let g be a functional mapping any set E into itself. Professor Isaacs discussed the existence of a function f of similar type such that for all x in E, one obtains $f(f(x)) = g(x)$. The speaker showed

that the existence criterion is that each linkage can be classified either into a matable pair or as self-matable.

7. Some consequences of Sterling's formula for log $\Gamma(z)$, by Professor H. K. Hughes, Purdue University.

In this paper, the speaker derived some series developments which he had occasion to use. The function

$$\frac{\Gamma(\alpha z + a)\Gamma(\beta z + b)}{\Gamma(\gamma z + c)\Gamma(\delta z + d)}$$

is typical of those developed. Here α, β, γ, δ are positive and such that $\alpha + \beta = \gamma + \delta$, and a, b, c, d are any real or complex numbers such that $a + b = c + d$. This function was expanded in the form of a factorial series multiplied by an exponential factor. The results obtained follow from Sterling's formula for log $\Gamma(z)$.

M. W. KELLER, *Secretary*

CALENDAR OF FUTURE MEETINGS

Thirtieth Summer Meeting, Madison, Wisconsin, September 6–7, 1948.

Thirty-second Annual Meeting, Columbus, Ohio, December 31, 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, Pennsylvania State College, May 8, 1948

ILLINOIS, Illinois Institute of Technology, Chicago, May 14–15, 1948

INDIANA, Purdue University, West Lafayette, May 8, 1948

IOWA, Fairfield, April 16–17, 1948

KANSAS, Atchison, April 10, 1948

KENTUCKY, Berea, May, 1948

LOUISIANA-MISSISSIPPI, Southwestern Louisiana Institute, Lafayette, La., April 23–24, 1948

MARYLAND-DISTRICT OF COLUMBIA-VIRGINIA, United States Naval Academy, Annapolis, Maryland, May 8, 1948

METROPOLITAN NEW YORK, Washington Irving High School, April 24, 1948

MICHIGAN, University of Michigan, Ann Arbor, April 3, 1948

MINNESOTA, College of St. Thomas, St. Paul, May 8, 1948

MISSOURI, University of Kansas City, Kansas City, April 23, 1948

NEBRASKA, University of Nebraska, Lincoln, May 1, 1948

NORTHERN CALIFORNIA

OHIO, Ohio State University, Columbus, April 3, 1948

OKLAHOMA

PACIFIC NORTHWEST, Eugene, Oregon, March 26–27, 1948

PHILADELPHIA, Philadelphia, Pa., Nov. 27, 1948

ROCKY MOUNTAIN, April 23–24, 1948

SOUTHEASTERN, The Citadel, Charleston, South Carolina, March 19–20, 1948

SOUTHERN CALIFORNIA, Redlands, March 13, 1948

SOUTHWESTERN, New Mexico Highlands University, Las Vegas, New Mexico, May 3–6, 1948

TEXAS, Rice Institute, Houston, April 23–24, 1948

UPPER NEW YORK STATE, Schenectady, May 1, 1948

WISCONSIN, Beloit, May 8, 1948