

77. *Concerning the limits of a measure of skewness*, by Professor Raymond Garver. (Abstract No. 38-9-213-t.)

78. *Concerning the mapping of locally connected continua on to simple arcs*, Preliminary communication, by Miss Beatrice Aitchison. (Abstract No. 38-11-231.)

M. H. INGRAHAM, *Associate Secretary*

INTERNATIONAL CONGRESS OF MATHEMATICIANS, ZURICH, 1932

BY R. G. D. RICHARDSON

Mathematicians from 37 countries to the number of approximately 650 together with 250 members of their families assembled in Zurich, Switzerland, for the Congress held September 4-12. As would be expected, the largest delegation of participants was from Switzerland (140), followed in order by Germany (111), France (68), United States and Canada (68), Italy (63), and Great Britain (38). The total attendance from this country and Canada, including members of the families of the active participants, was 104. Harvard and Brown had the largest delegations, there being four mathematicians from each. Among those who attended were the following 68 mathematicians:

C. R. Adams, R. B. Adams, J. W. Alexander, R. C. Archibald, I. A. Barnett, Garrett Birkhoff, H. F. Blichfeldt, D. G. Bourgin, R. W. Brink, W. D. Cairns, L. D. Cummings, L. L. Dines, H. L. Dorwart, H. T. Engstrom, F. J. Feinler, A. L. Foster, O. E. Glenn, M. C. Graustein, W. C. Graustein, Margaret Gurney, Einar Hille, T. R. Hollcroft, A. E. Holman, Charles Hopkins, W. A. Hurwitz, B. O. Koopman, A. M. Lehr, Florence Lewis, R. G. Lubben, E. M. Luse, Wilhelm Maier, T. E. Mason, G. M. Merriman, U. G. Mitchell, C. N. Moore, T. W. Moore, D. S. Morse, Marston Morse, Oystein Ore, R. A. C. Paley, G. Y. Rainich, R. G. D. Richardson, W. H. Roever, Stanislaw Saks, Arthur Sard, L. L. Silverman, W. G. Simon, L. G. Simons, D. E. Smith, P. A. Smith, Virgil Snyder, M. E. Stark, M. H. Stone, E. B. Stouffer, J. L. Synge, J. D. Tamarkin, Stepan Timoshenko, A. W. Tucker, J. S. Turner, H. W. Tyler, Oswald Veblen, H. M. Walker, J. L. Walsh, D. W. Weeks, J. H. C. Whitehead, D. V. Widder, Norbert Wiener, F. B. Williams.

The morning hours were occupied by 21 one-hour addresses given by invitation. This list included two presented by Americans and these were among the very best in material and form.

Nearly 200 other papers, including 27 by Americans and Canadians, were presented at sectional sessions in the afternoons.

Eight sections were organized: I. Algebra and Number Theory, II. Analysis, III. Geometry, IV. Probability and Statistics, V. Astronomy and Technical Mathematics, VI. Mechanics and Mathematical Physics, VII. Philosophy and History, VIII. Pedagogy. In II there were three parallel programs going forward at the same time and in III and VI two each, making in all twelve groups meeting simultaneously.

It is of interest to note that the first International Mathematical Congress was held in Zurich in 1897 and that the president of that gathering, Dr. Geiser, was present at this meeting. The 1932 Congress was organized by the University and the Technical Institute of Zurich, and Professor Fueter of Zurich presided in admirable fashion. The first scientific session was presided over by Hilbert and he was given a great ovation.

The official representatives of the Society present at the Congress were Professors C. N. Moore, R. G. D. Richardson, E. B. Stouffer, and J. D. Tamarkin; those of the United States government were J. W. Alexander, H. F. Blichfeldt, Marston Morse, M. H. Stone, and Oswald Veblen; those of the Mathematical Association of America were R. C. Archibald, W. D. Cairns, and D. E. Smith.

The following is a list of the invited addresses.

- I. R. Fueter, *Idealtheorie und Funktionentheorie.*
- II. C. Carathéodory, *Über die analytischen Abbildungen durch Funktionen mehrerer Veränderlicher.*
- III. G. Julia, *Essai sur le développement de la théorie des fonctions de variables complexes.*
- IV. W. Pauli, *Mathematische Methoden der Quantenmechanik.*
- V. N. Tschebotaröw, *Die Aufgaben der modernen Galois'schen Theorie.*
- VI. T. Carleman, *Sur la théorie des équations intégrales linéaires et ses applications.*
- VII. E. Cartan, *Sur les espaces riemanniens symétriques.*
- VIII. L. Bieberbach, *Operationsbereiche von Funktionen.*
- IX. M. Morse, *The calculus of variations in the large.*
- X. E. Noether, *Hyperkomplexe Systeme in ihren Beziehungen zur kommutativen Algebra und zur Zahlentheorie.*

XI. H. Bohr, *Fastperiodische Funktionen einer komplexen Veränderlichen.*

XII. F. Severi, *La théorie générale des fonctions analytiques de plusieurs variables et la géométrie algébrique.*

XIII. R. Nevanlinna, *Über die Riemannsche Fläche einer analytischen Funktion.*

XIV. R. Wavre, *L'aspect analytique du problème des figures planétaires.*

XV. J. W. Alexander, *Some problems in topology.*

XVI. F. Riesz, *Sur l'existence de la dérivée des fonctions d'une variable réelle et des fonctions d'intervalle.*

XVII. G. Valiron, *Le théorème de Borel-Julia dans la théorie des fonctions méromorphes.*

XVIII. W. Sierpinski, *Sur les ensembles de points qu'on sait définir effectivement.*

XIX. S. Bernstein, *Sur les liaisons entre quantités aléatoires.*

XX. K. Menger, *Neuere Methoden und Probleme der Geometrie.*

XXI. J. Stenzel, *Anschauung und Denken in der klassischen Theorie der griechischen Mathematik.*

The list of short papers presented by Americans either in person or by title is as follows:

C. R. Adams and J. A. Clarkson, *On definitions of bounded variation for functions of two variables.*

Elizabeth B. Cowley, *Technical vocabularies for plane and solid geometry.*

Louise D. Cummings, *On a method of comparison for straight line nets.*

L. L. Dines, *On linear inequalities.*

A. L. Foster, *On general Kronecker-(integer)-synthesis of disciplines.*

Solomon Gandz, *On alphabetical numerals.*

O. E. Glenn, *The mechanics of the stability of a central orbit.*

Einar Hille and J. D. Tamarkin, (1) *The summation of Fourier series by Hausdorff means.* (2) *On the summability of Fourier series.*

T. R. Hollcroft, *The general web of surfaces and the space involution defined by it.*

Edward Kasner, (1) *Element transformations of space for which normal congruences of curves are invariant.* (2) *Conformality in*

connection with functions of two complex variables. (3) *Conformal geometry in the complex domain.* (4) *Curvature theorems in dynamics.*

Wilhelm Maier, *Über die Riemannsche Q-Funktion.*

E. C. Molina, *An expansion for Laplacian integrals in terms of incomplete gamma functions, and some applications.*

C. N. Moore, *On certain properties of the Fourier constants of L-integrable functions of two variables.*

Oystein Ore, *Theory of non-commutative polynomials.*

G. Y. Rainich, *Determination of matter and force components from the Riemann tensor.*

Stanislaw Saks, *On certain functionals.*

D. E. Smith, *Presidential address of the International Committee on the Teaching of Mathematics.*

J. J. Smith, *An expression for Green's function in generalized coordinates.*

Virgil Snyder, *On a series of Cremona involutions defined by a pencil of ruled surfaces.*

E. B. Stouffer, *On the projective differential geometry of developable surfaces.*

J. L. Synge, *The equilibrium of a tooth with a general conical root.*

J. H. C. Whitehead, *Locally homogeneous spaces in differential geometry.*

Norbert Wiener and R. A. C. Paley, *Analytic properties of characters of infinite abelian groups.*

Printed abstracts of the short papers on the preliminary program were available on the opening day. The Proceedings will be published and sent to those participating in the Congress; these will contain the invited addresses in full and abstracts of the short papers.

The International Committee on the Teaching of Mathematics under the presidency of Professor D. E. Smith held a session which was constituted as a meeting of Section VIII. This Committee which had been revived at the Bologna Congress elected Hadamard as president, he being the third in the line after Klein and Smith. Vice-presidents elected include Lietzmann, Scorza, and Heegaard; and Fehr was made secretary-treasurer with E. H. Levi as assistant. It is the purpose of the Committee in

the next quadrennium to study the trend of the teaching of mathematics.

At one of the business sessions a telegram of felicitations was received from the Society at its session in Los Angeles. A message was received from Picard stating his regret at not being able to be present and a cordial reply was sent. A message of congratulation was sent to Brill on the occasion of his 90th birthday.

Neville made a statement to the Congress regarding the fund available for publication of mathematical tables and suggested that any person contemplating the issuing of tables consult him.

A resolution of deep regret on the recent death of Professor J. C. Fields was adopted. Fields had proposed to establish two gold medals, to be awarded at successive Congresses for outstanding achievement in mathematics. This offer was accepted by the Congress, and the following committee was appointed to name the recipients of the medals to be awarded in 1936: Severi (chairman), Birkhoff, Carathéodory, Cartan, and Tagaki.

The term of the statutes of the International Mathematical Union having expired with 1931, representatives of the various countries had been invited to a session to discuss what steps, if any, should be taken to perpetuate the organization. It should be pointed out that this Congress was not held under the auspices of the Union. At a meeting of those Americans present at Zurich, Professors C. N. Moore, R. G. D. Richardson, Virgil Snyder, and Oswald Veblen were chosen to represent the delegation. The sentiment of the group crystallized around three points: (1) that the invitation to the next Congress should be accepted by the present Congress rather than by the Union; (2) that it would appear that a permanent international organization had no problems important enough to warrant its existence; (3) that if an international organization in mathematics were to continue, it should be divorced from connection with national governments. The meeting of the Union took place at 10:00 A.M. on September 11 and it was voted to request President Fueter to name to the Congress the personnel of an international commission to investigate the desirability of continuing an international mathematical organization and to report to the Congress at Oslo, the Union in the meantime to be in abeyance. The Congress appointed such a Commission, the personnel consist-

ing of Severi (chairman), Alexandroff, Bohr, Fejér, Julia, Mor-dell, Terradas, de la Vallée-Poussin, Veblen, Weyl, and Zarem-ba. To this Commission was referred also a query raised in the Congress regarding the desirability of an international com-mittee on bibliography.

The beautiful city of Zurich was most hospitable and every arrangement was made for the comfort and entertainment of the visiting mathematicians. Excellent arrangements were made for caring for the visitors at moderate cost. Tuesday afternoon and Thursday were devoted to excursions to beautiful spots in the neighboring regions of Switzerland. On the evening of the 10th the State entertained the mathematicians and guests at a festi-val in the Stadttheater. President Fueter presided and among the speakers were Plancherel for the Zurich universities and Cartan, Severi, Veblen, and Weyl for the visitors. On the after-noon of the 11th the City entertained at a tea in a hotel in the suburbs. Several other entertainments were provided also, and a special program for the visiting ladies was carried out. A dis-play of recent mathematical books and of mathematical instru-ments was a feature of the meeting.

Resolutions of thanks for the generous hospitality provided were carried unanimously on motion of Bortolotti for the Con-gress and of Madame Riabouchinsky for the ladies.

An invitation from Norway to hold the next Congress in Oslo was presented at the last session and was accepted unani-mously.

BROWN UNIVERSITY