THE SUMMER MEETING IN MINNEAPOLIS

The thirty-seventh summer meeting and fifteenth colloquium of the Society were held at the University of Minnesota, Minneapolis, Minnesota, from Tuesday to Friday, September 8–11, 1931. The meeting was preceded by that of the Mathematical Association of America. About two hundred forty persons attended the meeting, among whom were the following one hundred forty-six members of the Society:

C. R. Adams, R. B. Adams, N. L. Anderson, R. C. Archibald, W. L. Ayres, R. H. Bardell, R. W. Barnard, Herman Betz, W. J. Berry, G. A. Bliss, M. G. Boyce, C. F. Bowles, W. C. Brenke, R. W. Brink, W. E. Brooke, H. E. Buchanan, J. A. Bullard, W. H. Bussey, W. D. Cairns, J. W. Campbell, Elizabeth Carlson, W. B. Carver, W. J. Cheney, E. W. Chittenden, G. R. Clements, A. B. Coble, C. J. Coe, Abraham Cohen, Julia Colpitts, R. P. Conkling, L. P. Copeland, A. T. Craig, C. F. Craig, E. H. Cutler, H. H. Dalaker, M. E. Daniels, L. L. Dines, J. M. Earl, M. C. Eide, G. C. Evans, H. P. Evans, H. S. Everett, K. W. Folley, W. B. Ford, Philip Franklin, T. C. Fry, H. J. Gay, J. J. Gergen, Gladys Gibbens, C. Gouwens, L. M. Graves, L. W. Griffiths, L. D. Hampton, W. L. Hart, M. L. Hartung, E. R. Hedrick, M. R. Hestenes, E. H. Hildebrandt, Einar Hille, J. J. L. Hinrichsen, P. G. Hoel, D. L. Holl, H. M. Hosford, E. V. Huntington, J. W. Hurst, Louis Ingold, M. H. Ingraham, Dunham Jackson, C. M. Jensen, B. W. Jones, W. H. Kirchner, E. P. Lane, H. I. Lane, R. E. Langer, C. G. Latimer, Lincoln La Paz, A. D. Lewis, C. I. Lubin, N. H. McCoy, C. C. MacDuffee, W. H. McEwen, J. V. McKelvey, M. M. McKelvey, N. B. MacLean, A. I. McMaster, W. D. MacMillan, A. J. Maria, H. W. March, Morris Marden, E. W. Miller, I. L. Miller, Norman Miller, W. L. Miser, C. N. Moore, W. L. Moore, Elmer Moots, D. C. Morrow, D. S. Morse, Marston Morse, T. A. Mossman, C. O. Oakley, Louis O'Shaughnessy, F. W. Owens, H. B. Owens, Gordon Pall, H. P. Pettit, T. Rado, Ruth Rasmussen, S. E. Rasor, W. T. Reid, B. L. Remick, R. G. D. Richardson, Paul Rider, H. L. Rietz, W. C. Risselman, P. G. Robinson, W. H. Roever, A. E. Ross, W. E. Roth, R. J. Sanger, I. J. Schoenberg, E. W. Sheldon, J. W. Shuman, R. R. Shumway, L. P. Siceloff, E. B. Skinner, H. E. Slaught, C. E. Smith, G. W. Smith, H. F. Smith, Virgil Snyder, E. B. Stouffer, Eugene Taylor, H. L. Turrittin, J. V. Uspensky, H. S. Vandiver, L. E. Ward, C. W. Watkeys, Warren Weaver, W. P. Webber, M. J. Weiss, Marian Wilder, E. W. Wilson, Marian White, Fredrick Wood, J. W. Young.

The colloquium lectures on the *Calculus of Variations* by Professor Marston Morse were delivered on Tuesday afternoon and Wednesday, Thursday and Friday mornings. A summary of these lectures will appear in a later issue of this Bulletin. By invitation of the Committee on Program, Professors Edmund Landau and C. C. MacDuffee gave, on Wednesday and Thurs-

day mornings respectively, addresses entitled *Schnirelmann's theorem* and *Ideals in linear algebras*.

On Monday evening the University of Minnesota tendered a reception to the visiting mathematicians. This was followed by cards, dancing and other entertainment. On Tuesday noon there was a luncheon for ladies at the Lafayette Club on Lake Minnetonka. On Wednesday evening the joint dinner of the Society and the Mathematical Association of America was held at the Minneapolis Automobile Club. Professor Dunham Jackson acted as toastmaster and called upon President Coffman of the University of Minnesota who welcomed the visitors to the University, Professor E. R. Hedrick who spoke of the plans for the meeting in California next summer, Miss Marie Weiss who urged upon the members the desirability of attendance at the New Orleans meetings and spoke of the many interesting features of New Orleans. Professor N. B. MacLean of McGill University spoke of the pleasant relationship existing between Canadian mathematicians and those of the United States, and Professor Warren Weaver gave the concluding talk of the evening. Thursday afternoon was devoted to an excursion to the Chisago Lakes and Taylor's Falls.

After lunch on Wednesday a group photograph of those in attendance was taken.

The Minneapolis Art Institute was open without fee to members of the Society. The golf course and tennis courts of the University of Minnesota were available to those in attendance at the meeting.

Most of the visitors were housed in Sanford Hall, and meals were served in its dining room. This building also served as a social center for the meeting. The arrangements which Professor Brink and the various local committees had made for the entertainment and comfort of the members of the Society and their friends were most successfully planned and carried out. All those present felt deeply grateful to the Minnesota group for their generous and thoughtful hospitality. This feeling was voiced by Professor Virgil Snyder at the general meetings on Thursday morning at which a rising vote of thanks was given to the local committees and others that had aided in preparing and carrying out the plans for the meeting.

The Council met on the evening of September 8 and various actions taken at this time were reported to the Society.

Yale University was elected to a Sustaining Membership.

The following seventy-three persons were elected to membership in the Society:

Dr. Dennis Burley Ames, Yale University;
Mr. Horace Crookham Ayres, University of Washington;
Mr. Aaron Bakst, Columbia University;
Dr. Arthur F. Bentley, Paoli, Indiana;
Dr. Henri Frédéric Bohnenblust, Princeton University;
Dr. Leonard Bristow, University of Illinois;
Mr. Donald Meeker Brown, University of Illinois;
Mr. John A. Carlson, University of Washington;
Mr. Philip Nathaniel Carpenter, University of Washington;
Miss Mary Frances Cleary, Boston;
Mr. George Comenetz, Columbia University;
Mr. Edwin G. H. Comfort, Wilmette, Ill.;
Miss Helen Marian Copenhagen, University of Washington;
Mr. Samuel Arthur Corey, Des Moines;
Dr. Allen Thornton Craig, University of Iowa;
Mr. Walter Sindall Dawkins, Baltimore;
Mr. Dewey S. Dearman, University of Cincinnati;
Mr. Richard Bolling Dunn, Yale University;
Mr. Milo Alembert Durand, Columbia University;
Mr. John K. Dyer, Yale University;
Mr. Ralph Asbury Edmondson, Wiley College;
Mr. George McNaught Ewing, University of Missouri;
Professor Donald Faulkner, Stetson University;
Professor Elmer Colin Goldsworthy, University of California;
Miss Mary Elizabeth Haller, University of Washington;
Mr. Charles Henry Harry, The Johns Hopkins University;
Professor Frances Harshbarger, Constantinople Woman's College;
Professor Thomas Watkins Hatcher, Virginia Polytechnic Institute;
Professor Leland David Hemenway, Simmons College;
Mr. Paul Herget, University of Cincinnati;
Professor Harry Grant Hodgkins, The George Washington University;
Miss Grace Murray Hopper, New York City;
Professor Howard Kibble Hughes, Purdue University;
Mr. Evan Johnson, Jr., Pennsylvania State College;
Miss Helen M. Kammerer, American Telephone and Telegraph Company;
Mr. Arthur James Kavanagh, Gunnery School, Washington, Conn.;
Mr. John Francis Kenney, Northwestern University;
Dr. Voris V. Latshaw, Fort Hays Kansas State College;
Mr. Reuben McDaniel, Shaw University;
Dr. Henry Jarvis Miles, University of Illinois;
Miss Alta Odoms, University of Cincinnati;
Miss Gladys Martha Quigg, Pennsylvania State College;

Mr. Lewis M. Reagan, Brooklyn Polytechnic Institute;
Mr. John Riordan, American Telephone and Telegraph Company;
Mr. Benjamin Rosenbaum, Milford School, Milford, Conn.;
Mr. Albert Louis Ruiz, General Electric Company, Schenectady;
Dr. William Monroe Rust, Jr., Rice Institute;
Dr. Isaac J. Schoenberg, University of Jassy, Jassy, Roumania, International
    Research Fellow;
Mr. Ellsworth Elmer Strock, Cleveland Heights, Ohio;
Mr. Erling D. Sunde, American Telephone and Telegraph Company;
Director William Francis Gray Swann, Bartol Research Foundation of the
    Franklin Institute, Swarthmore, Pa.;
Mr. Joseph Fraser Thomson, University of Michigan;
Mr. Hsien San-Tsang, Ithaca, N. Y.;
Professor Ralph Sylvester Underwood, Texas Technological College;
Dr. Samuel Stanley Wilks, Columbia University;
Dr. Aurel Frederick Wintner, The Johns Hopkins University;
Dr. Henry Marcus Yarbrough, Western Kentucky State Teachers College;
Dr. Robert Carl Yates, The Johns Hopkins University;
Miss Marguerite Zeigel, University of Missouri;

The Secretary announced the election of the following persons
to membership by mail vote of the Council:

Professor Harald Bohr, University of Copenhagen;
Professor Carl Syfan Cox, Southern College;
Mr. Joseph Leo Doob, Harvard University;
Mr. Marshall Hall, Yale University;
Mr. Sumner Byron Myers, Harvard University;
Mrs. Dorothy Pennock Nile, Columbia University;
Professor Brendon O'Connor, Catholic University, Peking;
Professor Maurice Marie Jean Potron, Ecole Sainte Geneviève, Paris;
Professor Wallace F. Smith, New River State College, Montgomery, W. Va.;

As nominees of Members of the Departments of Mathematics of Lehigh
and George Washington Universities:

Mr. Edwin L. Bartleson, U. S. Weather Bureau;
Mr. Abraham Sinkov, U. S. Civil Service;
Mr. Welby Reed Stevens, U. S. Weather Bureau;
Mr. Henry George Swain, Lehigh University;
Mr. Albert Wertheimer, Bureau of Ordnance, U. S. Navy.

The Joint Committee on Funds has been enlarged and now
consists of Professors R. C. Archibald, G. D. Birkhoff, G. A.
Bliss, W. D. Cairns, A. B. Coble, J. L. Coolidge, Tomlinson
Fort, Drs. T. C. Fry, J. W. Glover, Professors E. R. Hedrick,
M. H. Ingraham, G. W. Mullins, H. E. Slaught, D. E. Smith
and J. W. Young (chairman).

Invitations for the winter meeting of 1932 were received from

Bryn Mawr College, Duke University, and the George Washington University.

The Summer Meeting of 1932 in Los Angeles was set for the period August 30—September 2 and the following persons were appointed a Committee on Arrangements: Professor E. R. Hedrick, Chairman, Professors E. T. Bell, M. H. Ingraham, T. M. Putnam, and W. M. Whyburn.

The only other meeting on the Pacific Coast for 1932 is to be at Stanford University on April 9.

The following persons were reported as appointed to represent the Society: at the inauguration of Robert H. Ruff as President of Central College, Fayette, Mo., May 25, 1931, Professor W. D. A. Westfall; at the meeting of the Affiliation Committee of the American Association for the Advancement of Science, Pasadena, June 16, 1931, Professors E. T. Bell and E. R. Hedrick; at the dedication of the Lakeside Hospital, Cleveland, Ohio, June 17, 1931, Professor F. C. Jonah; at the Faraday Celebrations, sponsored by the Royal Institution of Great Britain, held in London, England, September 21–25, 1931, Professor G. H. Hardy; at the Seventh American Scientific Congress sponsored by the Pan American Union and to be held in Mexico City during February 1932, Professor Oswald Veblen.

In connection with the World's Fair to be held in Chicago in 1933 there is to be an important exhibition showing the progress of science during the past century. This is to include a mathematics exhibit and it is planned that the Society hold its Summer Meeting in Chicago at the time of the meeting of the American Association for the Advancement of Science probably during the last week of June. The Fair is inviting a group of foreign scientists to lecture and a committee of the Society has made recommendations regarding personnel in mathematics.

The titles and cross references to abstracts of the papers read at the sessions follow below. The papers whose abstract numbers are followed by the letter t were read by title, the rest in person. The papers were read as follows: papers numbered 1 to 5 before a general session on Tuesday afternoon at which Professor E. R. Hedrick presided; papers numbered 6 to 23, 53, 71, 73, and 74 Wednesday afternoon in a section on Analysis, Professor Warren Weaver presiding; papers numbered 24 to 50

and 72 Wednesday afternoon in a section on Algebra and To-
pology, Professors C. G. Latimer and C. C. MacDuffee pre-
siding; and papers numbered 51, 53, 54 to 69, and 75 at a general
session on Friday morning with Professor Virgil Snyder presid-
ing. Professor Franklin presented paper No. 6, Professor W. B.
Ford paper No. 7, and Dr. Hartung paper No. 11. Professor
Hassel was introduced by Professor Albert, Dr. Hopf by Pro-
fessor Tamarkin, Mr. Scherberg and Dr. Edgett by Professor
Ingraham, and Dr. Robinson by Professor E. W. Chittenden.

1. *On linear inequalities*, by Professor L. L. Dines and Dr.
N. H. McCoy (National Research Fellow). (Abstract No. 37–9–
278.)

2. *Transformations of double sequences, with application to
Cesàro summability of double series*, by Professor C. R. Adams.
(Abstract No. 37–9–279.)

3. *Note on the application of Markoff's theorem to problems of
approximation in the complex domain*, by Professor Dunham
Jackson. (Abstract No. 37–5–233.)

4. *On Jordan continua that are the common boundaries of two
or more domains in E_n*, by Professor R. L. Wilder. (Abstract No.
37–7–258–*t*.)

5. *The Cauchy integral and summable boundary functions*, by
Professor G. C. Evans. (Abstract No. 37–9–280.)

6. *Dual Pfaffians*, by Professors C. L. E. Moore and Philip
Franklin. (Abstract No. 37–9–281.)

7. *On the behavior of entire functions in distant portions of the
plane*, by Professor C. V. Newsom. (Abstract No. 37–9–282.)

8. *On sets of constants which are not the Fourier constants of a
function integrable* (*L*), by Professor C. N. Moore. (Abstract No.
37–9–283.)

9. *On Stieltjes polynomials* (second paper), by Professor Mor-
ris Marden. (Abstract No. 37–7–271.)

10. *On the asymptotic forms of the solutions of differential equa-
tions*, by Professor R. E. Langer. (Abstract No. 37–9–284.)

11. *On a class of integral equations with a finite discontinuity in
the kernel*, by Professor R. E. Langer and Dr. M. L. Hartung.
(Abstract No. 37–9–285.)

12. *Some extensions of the Schwarz-Stieltjes theorem of mean
value and some consequences deduced therefrom*, by Professor
Norman Miller. (Abstract No. 37–9–286.)

13. *On the condition of Weierstrass in the problem of Lagrange,* by Professor L. M. Graves. (Abstract No. 37–9–287.)

14. *A boundary value problem associated with the calculus of variations,* by Dr. W. T. Reid (National Research Fellow). (Abstract No. 37–9–288.)

15. *Note on multiple Dirichlet and multiple factorial series,* by Professor C. R. Adams. (Abstract No. 37–9–289–t.)

16. *Note on Volterra and Fredholm products of symmetric kernels,* by Dr. L. M. Blumenthal. (Abstract No. 37–7–262–t.)

17. *An inequality for the Bessel functions of the first kind with imaginary argument,* by Dr. T. H. Gronwall. (Abstract No. 37–7–276–t.)

18. *On Stieltjes continued fractions,* by Professor J. A. Shohat. (Abstract No. 37–9–290–t.)

19. *On some applications of Parseval's formula,* by Professor J. A. Shohat. (Abstract No. 37–9–291–t.)

20. *The k-function, a particular case of the confluent hypergeometric function,* by Professor Harry Bateman. (Abstract No. 37–9–292–t.)

21. *On a theorem of S. Bernstein-Widder,* by Professor J. D. Tamarkin. (Abstract No. 37–9–293–t.)

22. *Complexes and dimension theory,* by Professor G. C. Evans. (Abstract No. 37–9–294–t.)

23. *The Euler-Lagrange multiplier rule for double integrals,* by Mr. Max Coral. (Abstract No. 37–7–273–t.)

24. *On the equation $P(A, X) = 0$ in matrices,* by Professor W. E. Roth. (Abstract No. 37–9–295.)

25. *A correspondence between classes of matrices and classes of ideals,* by Professor C. G. Latimer. (Abstract No. 37–9–296.)

26. *On the method of infinite descent and Fermat's last theorem for regular prime exponents,* by Professor H. S. Vandiver. (Abstract No. 37–9–297.)

27. *A supplement to the law of inertia for real quadratic forms with an application to the projective geometry of-hyperquadrics,* by Dr. I. J. Schoenberg (International Research Fellow). (Abstract No. 37–7–274.)

28. *On Selling's reduction of positive ternary quadratic forms,* by Professor B. W. Jones. (Abstract No. 37–7–266.)

29. *On the resultant of a system of forms homogeneous in each*

of several sets of variables, by Dr. N. H. McCoy (National Research Fellow). (Abstract No. 37–7–260.)

30. *Note on a property of continuous arcs*, by Professor W. L. Ayres. (Abstract No. 37–9–298.)

31. *On a kind of homogeneity in continuous curves*, by Dr. E. W. Miller. (Abstract No. 37–9–299.)

32. *An application of metric geometry to determinants*, by Dr. L. M. Blumenthal. (Abstract No. 37–7–263–t.)

33. *A note on cyclic algebras of order sixteen*, by Professor A. A. Albert. (Abstract No. 37–7–267–t.)

34. *On the construction of cyclic algebras with a given exponent*, by Professor A. A. Albert. (Abstract No. 37–7–268–t.)

35. *Division algebras over an algebraic field*, by Professor A. A. Albert. (Abstract No. 37–7–269–t.)

36. *Algebras without moduli which are equivalent to the algebras of their first and their second matrices*, by Mr. L. E. Bush. (Abstract No. 37–9–300–t.)

37. *Theory of cyclic algebras over an algebraic field*, by Professor H. Hasse. (Abstract No. 37–9–301–t.)

38. *On rational transformations*, by Professor Raymond Garver. (Abstract No. 37–9–302–t.)

39. *On the second factor of the class number of a cyclotomic field*, by Professor H. S. Vandiver. (Abstract No. 37–9–303–t.)

40. *On the norm-residue symbol in the theory of cyclotomic fields*, by Professor H. S. Vandiver. (Abstract No. 37–9–304–t.)

41. *Summary of results and proofs on Fermat's last theorem* (sixth paper), by Professor H. S. Vandiver. (Abstract No. 37–9–305–t.)

42. *Two theorems concerning abstract spaces*, by Professor R. G. Lubben. (Abstract No. 37–7–264–t.)

43. *Concerning regular accessibility*, by Miss Beatrice Aitchison. (Abstract No. 37–7–265–t.)

44. *An examination of some cut sets of space*, by Mr. C. H. Harry. (Abstract No. 37–7–270–t.)

45. *Concerning non-locally compact spaces*, by Mr. C. H. Harry. (Abstract No. 37–9–306–t.)

46. *On cyclic numbers of one-dimensional compact sets*, by Professor W. A. Wilson. (Abstract No. 37–9–307–t.)

47. *On upper semi-continuous decompositions of compact continua*, by Professor W. A. Wilson. (Abstract No. 37–9–308–t.)

48. *A junction property of locally connected sets*, by Professor G. T. Whyburn. (Abstract No. 37–9–309–*t*.)

49. *Regular chains and their application to proofs in point set theory*, by Professor G. T. Whyburn. (Abstract No. 37–9–310–*t*.)

50. *Group invariants and torsion coefficients*, by Dr. A. B. Brown. (Abstract No. 37–7–259–*t*.)

51. *Examples of harmonic functions*, by Professor A. J. Maria. (Abstract No. 37–9–311.)

52. *On deferred Cesàro means*, by Dr. R. P. Agnew (National Research Fellow). (Abstract No. 37–7–261–*t*.)

53. *The degree of convergence of a series of Bessel functions*, by Mr. M. G. Scherberg. (Abstract No. 37–7–272–*t*.)

54. *An invariantive classification of plane cubic curves under the affine group*, by Dr. R. S. Burington. (Abstract No. 37–9–312–*t*.)

55. *On a covariant differentiation process*, by Professor H. V. Craig. (Abstract No. 37–9–313–*t*.)

56. *Characteristic properties of the euclidean length integral*, by Professor Lincoln LaPaz. (Abstract No. 37–9–314–*t*.)

57. *On a method of summation of infinite series and geometrical interpretation of the method*, by Mr. E. A. Kholodovsky. (Abstract No. 37–7–257–*t*.)

58. *Vector treatment of the displacements of a rigid body*, by Professor C. J. Coe. (Abstract No. 37–9–315.)

59. *A simplified theory of the figure of the earth* (preliminary communication), by Professor E. V. Huntington. (Abstract No. 37–9–316.)

60. *Systems of polynomials connected with the Pearson differential and difference equations*, by Professor E. H. Hildebrandt. (Abstract No. 37–9–317.)

61. *On the distribution of the correlation coefficient in small samples*, by Professor P. R. Rider. (Abstract No. 37–9–318.)

62. *The probability limit theorem*, by Professor A. H. Copeland. (Abstract No. 37–9–319–*t*.)

63. *Frequency distributions with given statistics which are not all moments*, by Dr. G. L. Edgett. (Abstract No. 37–9–320–*t*.)

64. *On the Tchebycheff inequality of Bernstein*, by Dr. C. C. Craig (National Research Fellow). (Abstract No. 37–9–321–*t*.)

65. *On the theory of potentiometric titration*, by Dr. T. H. Gronwall. (Abstract No. 37–7–275–*t*.)

66. *A special conformal space of three dimensions occurring in wave mechanics*, by Dr. T. H. Gronwall. (Abstract No. 37–7–277–*t*.)

67. *Two notes on the mathematics of finance*, by Professor Raymond Garver. (Abstract No. 37–9–322–*t*.)

68. *Circular trajectories in dynamics*, by Professor Edward Kasner. (Abstract No. 37–7–253–*t*.)

69. *Proof of a generalized form of Newton's law of gravity*, by Professor O. E. Glenn. (Abstract No. 37–7–255–*t*.)

70. *Arithmetical composition and inversion of functions over classes*, by Professor E. T. Bell. (Abstract No. 37–9–323–*t*.)

71. *On the uniqueness of the solution of the problem of Plateau*, by Professor Tibor Rado. (Abstract No. 37–9–324.)

72. *Concerning S-regions in locally connected continua*, by Professor G. T. Whyburn. (Abstract No. 37–9–325–*t*.)

73. *Theory of measure and invariant integrals*, by Dr. Eberhard Hopf. (Abstract No. 37–9–326–*t*.)

74. *Poisson's equation with relation to sub-harmonic functions*, by Professor G. C. Evans. (Abstract No. 39–9–327–*t*.)

75. *Concerning theorems in general topology*, by Dr. Selby Robinson. (Abstract No. 39–9–328.)

<div align="right">MARK H. INGRAHAM,
Associate Secretary</div>