

THE APRIL MEETING IN WASHINGTON

The three hundred sixty-ninth meeting of the American Mathematical Society was held at The George Washington University, Washington, D. C., on Friday and Saturday, April 26–27, 1940. The attendance included the following one hundred sixty members of the Society:

C. R. Adams, C. B. Allendoerfer, R. C. Archibald, J. V. Atanasoff, Harry Bateman, E. E. Betz, Archie Blake, R. P. Boas, A. T. Brauer, Richard Brauer, R. S. Burlington, Herbert Busemann, W. E. Byrne, S. S. Cairns, J. W. Calkin, W. B. Campbell, C. E. Carey, Randolph Church, Paul Civin, J. M. Clarkson, G. R. Clements, Abraham Cohen, I. S. Cohen, Nancy Cole, M. J. Cox, H. S. M. Coxeter, P. D. Crout, H. B. Curry, Tobias Dantzig, C. H. Dowker, Arnold Dresden, J. E. Eaton, Samuel Eilenberg, L. P. Eisenhart, M. L. Elveback, Paul Erdős, W. K. Feller, E. J. Finan, D. A. Flanders, W. W. Flexner, R. M. Foster, Hilda Geiringer, Abe Gelbart, P. W. Gilbert, Wallace Givens, Michael Goldberg, Michael Golomb, B. L. Hagen, D. W. Hall, O. G. Harrold, Philip Hartman, G. A. Hedlund, Edward Helly, Olaf Helmer, J. G. Herriot, Einar Hille, M. P. Hollcroft, T. R. Hollcroft, Witold Hurewicz, Nathan Jacobson, S. A. Jennings, Evan Johnson, R. F. Johnson, F. E. Johnston, H. A. Jordan, E. R. van Kampen, Wilfred Kaplan, J. L. Kelley, S. C. Kleene, J. R. Kline, E. R. Kolchin, H. L. Krall, W. D. Lambert, O. E. Lancaster, A. E. Landry, Solomon Lefschetz, D. T. McClay, N. H. McCoy, Brockway McMillan, E. J. McShane, H. M. MacNeille, Dorothy Manning, A. V. Martin, M. H. Martin, F. M. Mears, A. D. Michal, Don Mittleman, T. W. Moore, R. C. Morrow, Marston Morse, D. C. Murdoch, F. D. Murnaghan, F. G. Myers, John von Neumann, C. O. Oakley, Oystein Ore, F. W. Owens, H. B. Owens, J. C. Oxtoby, N. G. Parke, G. W. Patterson, P. M. Pepper, R. S. Phillips, H. A. Rademacher, O. J. Ramler, H. J. Riblet, J. N. Rice, R. G. D. Richardson, J. F. Ritt, J. H. Roberts, H. P. Robertson, G. de B. Robinson, L. B. Robinson, R. E. Root, J. E. Rosenthal, Barkley Rosser, O. F. G. Schilling, Abraham Schwartz, G. E. Schweigert, C. H. W. Sedgewick, I. E. Segal, Wladimir Seidel, Abraham Seidenberg, L. W. Sheridan, R. G. Simond, Abraham Sinkov, H. L. Smith, J. P. Smith, P. A. Smith, Virgil Snyder, F. W. Sohon, V. E. Spencer, J. M. Stetson, E. B. Stouffer, J. L. Synge, J. H. Taylor, J. M. Thomas, E. W. Titt, C. B. Tompkins, A. W. Tucker, L. B. Tuckerman, J. W. Tukey, Oswald Veblen, G. L. Walker, A. D. Wallace, J. V. Wehausen, F. M. Weida, Albert Wertheimer, F. J. Weyl, Hermann Weyl, A. P. Wheeler, C. H. Wheeler, P. A. White, A. L. Whiteman, G. T. Whyburn, S. S. Wilks, John Williamson, H. A. Wood, J. W. Wrench, J. W. T. Youngs.

The meeting opened Friday morning in two sections, Analysis, Professor J. L. Synge presiding, and Topology, Professor A. D. Michal presiding.

At the general session Friday afternoon, Vice President F. D. Murnaghan presiding, Professor A. W. Tucker of Princeton University gave an address entitled *Complexes and tensors*. An informal meeting of those especially interested in the application of tensor

analysis to electrical engineering was held immediately following this address.

The general session was followed by two sections: Algebra, Professor Hermann Weyl presiding; Applied Mathematics, Geometry and Logic, Professor S. C. Kleene presiding.

Two general sessions were held Saturday morning. At the first, Professor Arnold Dresden presiding, Professor Wladimir Seidel of the University of Rochester gave an address entitled *Univalent and multivalent functions*. The second, Vice President C. R. Adams presiding, was for short papers on various subjects.

All sessions were held in the Hall of Government, The George Washington University.

On Friday afternoon, tea was served in Columbian House, Mrs. J. H. Taylor, hostess.

The dinner Friday evening at the Cosmos Club was attended by one hundred thirty-eight mathematicians and guests. The toastmaster, Professor Marston Morse, introduced President C. H. Marvin of The George Washington University who welcomed the mathematicians and generously invited the Society to hold its meetings at The George Washington University whenever it chose to do so. President Marvin was followed by three speakers, Professors Oswald Veblen, Oystein Ore and E. J. McShane, who spoke briefly on *The Mathematical Reviews*, *Art and mathematics*, and *Mathematics in South America*, respectively.

The Council met at 9:00 P.M., Friday, April 26, in the Holmes Room of the Cosmos Club.

At the general session Saturday morning Professor Barkley Rosser presented a resolution expressing the appreciation and thanks of the Society to the President of The George Washington University, the members of the local committee, the Mathematics Department and all others concerned for their competent arrangements and cordial hospitality. This resolution was unanimously adopted.

The Secretary announced the election of the following seventy-three persons to membership in the Society:

Mr. Lucius Anthony, Seattle, Wash.;
Professor José Barral-Souto, University of Buenos Aires;
Dr. Alfred Basch, Holy Cross College, Worcester, Mass.;
Mr. Jacob Bearman, University of Minnesota;
Professor Richard A. Beth, Michigan State College;
Dr. Willard E. Bleick, Gibbs and Cox, Incorporated, New York, N. Y.;
Mr. Augusto Bobonis, University of Puerto Rico;
Professor Alexander William Boldyreff, University of Arizona;
Dr. Achille Capecehatro, New York, N. Y.;

- Mr. George P. Cowan, St. John's University, Brooklyn, N. Y.;
- Miss Mary Elizabeth Agnes Dever, Manhattanville College of the Sacred Heart;
- Dean Alfonso Elder, North Carolina College for Negroes, Durham, N. C.;
- Miss Frances E. Falvey, Ward-Belmont School, Nashville, Tenn.;
- Professor Joseph Homer Forrest, Langston University, Langston, Okla.;
- Mr. Franklin H. Fowler, Jr., New York, N. Y.;
- Mr. Arthur Tapley French, State Teachers College, Winona, Minn.;
- Mr. John Raymond Fritz, Wyomissing Polytechnic Institute, Wyomissing, Pa.;
- Mr. Robert Elston Fullerton, Syracuse University;
- Professor Andre Gleyzal, St. Michael's College, Winooski Park, Vt.;
- Dr. Hans-Karl Hammer, Texas Company Research Laboratories, Beacon, N. Y.;
- Mr. Wesley Turnell Hanson, Technical High School, Atlanta, Ga.;
- Dr. George Edward Hay, Armour Institute of Technology;
- Dr. Edward Helly, New York, N. Y.;
- Dr. Morris Hendrickson, Ohio State University;
- Mrs. Frances Louise Campbell Hinds, George Pepperdine College, Los Angeles, Calif.;
- Sister Mary Charlotte Holland, St. Xavier College for Women, Chicago, Ill.;
- Professor Elvin Albert Hoy, University of Hawaii;
- Mr. Robert Sigurd Jacobson, Luther College;
- Mr. E. A. Johnson, Phoenix, Ariz.;
- Mr. Andrew Richard Kirby, College of the City of New York and Fordham University;
- Mr. Calvin John Kirchen, Itasca Junior College, Coleraine, Minn.;
- Mr. Stephen Anthony Kiss, Standard Oil Development Company, New York, N. Y.;
- Mr. Richard Frederick Koch, Bard College, Columbia University;
- Mr. Paul Herbert Kratz, Temple University;
- Mr. Joseph S. Leech, College of Mines and Metallurgy, El Paso, Texas;
- Mr. John N. B. Livingood, Gettysburg College;
- Mr. Jack Lorell, Brown University;
- Mr. Charles Edward McCauley, Woodstock College, Woodstock, Md.;
- Mr. Charles B. McMullen, State Teachers College, Hyannis, Mass.;
- Dr. Joanna Mayer, Xavier University, New Orleans, La.;
- Mr. Herman Meyer, University of Chicago;
- Professor José M. Mijares, Mapua Institute of Technology, Manila, P. I.;
- Mr. Fred A. Miller, Wentworth Military Academy, Lexington, Mo.;
- Dr. Richard von Mises, Harvard University;
- Mr. Nathan Morrison, Division of Placement of Unemployment Insurance, New York State Department of Labor, New York, N. Y.;
- Professor Mario John Nardelli, Fordham University;
- Professor Edwin Burman Ogden, Union College, Lincoln, Neb.;
- Mr. William Gray Palm, Jr., University of Nevada;
- Mr. George William Patterson, National Bureau of Standards, Washington, D. C.;
- Professor William Anderson Patterson, Fenn College, Cleveland, Ohio;
- Professor Francisco Perez, University of the Philippines;
- Miss Edris Pauline Rahn, Hayward Union High School, Hayward, Calif.;
- Reverend John H. Raymond, St. Martin's College, Lacey, Wash.;
- Dr. Paul V. Reichelderfer, Ohio State University;
- Dr. Irving F. Ritter, New York University;
- Mr. Walter C. Roberts, Glendale Junior College, Glendale, Calif.;
- Professor Alexander Russ, Mississippi Woman's College, Hattiesburg, Miss.;

Professor Thomas Justin Saunders, University of San Francisco;
 Reverend Maurice Andrew Scheier, St. Bonaventure College, St. Bonaventure, N. Y.;
 Dr. Herman M. Schwartz, Duquesne University;
 Dr. Andrew Sobczyk, Oregon State College;
 Miss Ethel Sutherland, Teachers College, Columbia University;
 Mr. Francis Xavier Sutton, Princeton University;
 Professor Hubert M. Thaxton, Agricultural and Technical College of North Carolina,
 Greensboro, N. C.;
 Dr. George Raymond Thurman, University of Missouri;
 Professor Gerhard Tintner, Iowa State College;
 Mr. Louis Bryant Tuckerman, III, Princeton University;
 Professor Enrique T. Virata, University of the Philippines;
 Dr. Abraham Wald, Columbia University;
 Professor Marjorie Watson, Huntingdon College, Montgomery, Ala.;
 Mr. William Wernick, New York, N. Y.;
 Mr. Hugh S. Westbrook, U. S. Army Air Corps, Chicago, Ill.;
 Mr. John Davis Williams, Princeton University.

It was reported that the following had been elected as nominees on the Institutional Memberships of the institutions indicated:

California Institute of Technology: Messrs. J. P. LaSalle, A. B. Mewborn, and J.R. Woolson.
 Duke University: Messrs. Paul Civin and Milton Preston Jarnagin, Jr.
 Pennsylvania State College: Messrs. Paul M. Kendig (Schuylkill Undergraduate Center, Pottsville, Pa.) and H. H. Reichard (Hazleton Undergraduate Center, Hazleton, Pa.).
 Wayne University: Mr. Herbert Kapfel Brown.
 Yale University: Messrs. Bengt Edvin Carlson, Eli Sherman Grable, and Wendell Gayton Swope.

It was announced that Dr. Joseph Gillis of Queen's University, Belfast, Northern Ireland, and Professor John Greenlees Semple of King's College, University of London, have been admitted to membership in the Society in accordance with the reciprocity agreement with the London Mathematical Society.

The Secretary announced that the meeting in Seattle, arranged to be held with the American Association for the Advancement of Science, is set for June 20, 1940. It was voted to hold an autumn meeting at Wayne University on November 22-23, 1940, and another at the University of California at Los Angeles on November 23; also a spring meeting at the University of Chicago on April 11-12, 1941. An invitation to hold the Annual Meeting of 1941 at the University of Florida was received.

The following appointments by President G. C. Evans to the four Committees on Invited Addresses were reported: for the Annual and Summer Meetings, Professor L. M. Graves (two years); for Eastern Meetings, Professors Einar Hille (two years) and J. L. Walsh (one

year to replace Dean L. P. Eisenhart, resigned); for Western Meetings, Professor E. W. Chittenden (two years); for Far Western Meetings, Professor Gabor Szegö (two years).

On recommendation of the Editorial Committee on Colloquium, a book by Professor Norman Levinson entitled *Tauberian Theorems and Gap Theorems* was accepted for publication in the Colloquium Series.

A special and unusual program is being arranged for the Summer Meeting of 1941 to be held at the University of Chicago in connection with the fiftieth anniversary of the founding of that institution. The following Committee on Arrangements was appointed: Professors L. M. Graves (chairman), A. A. Albert, W. L. Ayres, G. A. Bliss, W. D. Cairns, L. R. Ford, E. J. Moulton, and Dr. R. G. Sanger. A special Committee on Program was also appointed, consisting of Professors A. A. Albert (chairman), W. L. Ayres, G. A. Bliss, and T. H. Hildebrandt.

Titles and cross references to the abstracts of the papers read follow below. Papers whose abstract numbers are followed by the letter *t* were read by title. The papers numbered 1 to 8 were read before the section for Analysis; those numbered 9 to 18 before the section for Topology; those numbered 19 to 24 before the section for Algebra; those numbered 25 to 30 before the section for Applied Mathematics, Geometry and Logic; those numbered 31 to 36 before the general session on Saturday morning; and papers numbered 37 to 92 were read by title. Paper 11 was read by Dr. Eilenberg, paper 29 by Professor Crout, and paper 33 by Dr. Schilling. Dr. Bergman was introduced by Professor W. T. Martin, Dr. Hua by Professor Hermann Weyl, Mr. Hurwitz by Professor G. D. Birkhoff, and Mr. Western by Dr. D. W. Hall.

1. Paul Civin: *Inequalities for trigonometric integrals*. Preliminary report. (Abstract 46-5-248.)

2. F. J. Weyl: *On the defect relation for meromorphic curves*. (Abstract 46-5-346.)

3. Stefan Bergman: *On the surface integrals of functions of two complex variables*. (Abstract 46-5-235.)

4. H. L. Krall: *Orthogonal polynomial solutions of a certain fourth order differential equation*. (Abstract 46-5-289.)

5. E. W. Titt: *On the characteristic theory of a first order partial differential equation*. (Abstract 46-7-367.)

6. R. P. Boas: *Univalent derivatives of entire functions*. (Abstract 46-5-238.)

7. Wilfred Kaplan: *Singularities of a curve-family on a surface, with applications to differential equations*. (Abstract 46-5-285.)

8. Michael Golomb: *On the boundary-value problems of the equation $\Delta u = g(x, y)$ in the infinite half-strip.* (Abstract 46-5-274.)
9. J. L. Kelley: *On the hyperspaces of a continuum.* (Abstract 46-5-287.)
10. P. M. Pepper: *Concerning pseudo-planar-quintuples.* (Abstract 46-5-313.)
11. Samuel Eilenberg and R. L. Wilder: *Uniform local contractibility.* (Abstract 46-5-269.)
12. A. D. Wallace: *On separation spaces.* (Abstract 46-7-368.)
13. G. E. Schweigert: *Equivalence of pointwise periodic and interior transformations on dendrites.* (Abstract 46-5-322.)
14. S. S. Cairns: *Triangulated manifolds which are not Brouwer manifolds.* (Abstract 46-7-355.)
15. O. G. Harrold (National Research Fellow): *Minimal coverings of Peano spaces by maps of a circle.* (Abstract 46-5-276.)
16. I. E. Segal: *Certain topological rings.* (Abstract 46-7-366.)
17. P. A. White: *On certain relatively non-alternating transformations.* (Abstract 46-5-347.)
18. D. W. Hall: *On arc and tree preserving transformations.* (Abstract 46-7-360.)
19. H. J. Riblet: *Factorization of differential ideals in an algebraic differential field.* (Abstract 46-5-318.)
20. H. S. M. Coxeter: *The binary polyhedral groups, and other generalizations of the quaternion group.* (Abstract 46-5-252.)
21. Olaf Helmer: *A new type of transcendence proof.* (Abstract 46-5-278.)
22. Richard Brauer: *On the Cartan invariants of a group of finite order.* (Abstract 46-5-239.)
23. J. E. Eaton: *On the extension of groups. I. Normal extensions. II. Non-normal extensions.* (Abstract 46-7-359.)
24. D. C. Murdoch: *A characterization of abelian quasi-groups.* (Abstract 46-5-304.)
25. M. H. Martin: *Quasi-Lagrangian systems.* Preliminary report. (Abstract 46-7-364.)
26. J. M. Clarkson: *An involutorial line transformation associated with a quadric.* (Abstract 46-5-250.)
27. Harry Bateman: *Hulthen's integral equation.* Preliminary report. (Abstract 46-5-231.)
28. H. B. Curry: *A formulation of recursive arithmetic.* (Abstract 46-5-253.)
29. F. B. Hildebrand and P. D. Crout: *A least square procedure for*

improving a method for solving integral equations by polynomial approximation. (Abstract 46-3-175.)

30. D. T. McClay: *On certain manifolds of somas.* (Abstract 46-5-292.)

31. J. H. Roberts: *A theorem on dimension.* (Abstract 46-5-319.)

32. J. L. Synge: *On the electromagnetic two-body problem.* (Abstract 46-5-329.)

33. Saunders MacLane and O. F. G. Schilling: *Normal algebraic number fields.* (Abstract 46-5-294.)

34. E. J. McShane: *On the second variation in certain anormal problems of the calculus of variations.* (Abstract 46-5-209.)

35. Oystein Ore: *The extension problem for groups.* (Abstract 46-5-311.)

36. A. D. Michal: *Higher order differentials of functions with arguments and values in topological abelian groups.* (Abstract 46-5-298.)

37. R. P. Agnew: *Some remarks on a paper entitled "General Tauberian theorems."* (Abstract 46-5-226-t.)

38. Stefan Bergman: *On a generalized Green's function and certain of its applications.* (Abstract 46-7-353-t.)

39. R. P. Boas: *Expansions of analytic functions.* (Abstract 46-5-237-t.)

40. Leonard Carlitz: *A set of polynomials.* (Abstract 46-5-243-t.)

41. Leonard Carlitz: *On certain exponential sums.* (Abstract 46-5-244-t.)

42. Randolph Church: *Numerical analysis of certain free distributive structures.* (Abstract 46-5-245-t.)

43. Nancy Cole: *The index theorem for a calculus of variations problem in which the integrand is discontinuous.* (Abstract 46-5-251-t.)

44. J. L. Coolidge: *Analytic systems of central conics in space.* (Abstract 48-7-356-t.)

45. Richard Courant: *On a generalized form of Plateau's problem.* (Abstract 46-7-357-t.)

46. M. M. Day: *A norm ergodic theorem.* (Abstract 46-5-257-t.)

47. M. M. Day: *Linear methods of summability. II.* (Abstract 46-5-258-t.)

48. A. González Domínguez: *Some theorems on the Hermite singular kernel.* (Abstract 46-7-358-t.)

49. J. J. DeCicco: *The affinelong near-Laguerre transformations.* (Abstract 46-5-259-t.)

50. E. L. Dodd: *The substitutive mean and certain subclasses of this general mean.* (Abstract 46-5-260-t.)

51. Jesse Douglas: *A new special form of the linear element of a surface.* (Abstract 46-5-262-t.)
52. Abe Gelbart: *On the growth of a function of two complex variables satisfying certain partial differential equations.* (Abstract 46-5-272-t.)
53. O. G. Harrold (National Research Fellow): *Characterizations of a class of continua by means of continuous functions.* (Abstract 46-5-275-t.)
54. M. H. Heins: *A note on a theorem of Radó.* (Abstract 46-5-207-t.)
55. L. K. Hua: *On Waring's problem for cubic polynomial summands.* (Abstract 46-5-280-t.)
56. L. K. Hua: *On the number of partitions of a number into unequal parts.* (Abstract 46-5-279-t.)
57. Henry Hurwitz: *On certain wave equations analogous to the Dirac equations.* (Abstract 46-5-281-t.)
58. Edward Kasner and J. J. DeCicco: *Families of curves conformally equivalent to circles.* (Abstract 46-5-286-t.)
59. B. O. Koopman: *Intuitive probability and sequences.* (Abstract 46-5-288-t.)
60. A. N. Lowan and Hyman Serbin: *On upper bounds for the remainder in the evaluation of differences.* (Abstract 46-7-363-t.)
61. A. N. Lowan and Jack Laderman: *On the distribution of errors in the computation of tables by differences.* (Abstract 46-7-362-t.)
62. E. J. McShane: *On the theory of relative extrema.* (Abstract 46-5-293-t.)
63. Margaret P. Martin: *A sequence of tests for the convergence and divergence of infinite series.* (Abstract 46-5-295-t.)
64. Philip Newman: *The geometry of the (2, 2) planar connex.* Preliminary report. (Abstract 46-5-306-t.)
65. Rufus Oldenburger: *Binary forms.* (Abstract 46-5-308-t.)
66. Oystein Ore: *Remarks on structures and group relations.* (Abstract 46-5-310-t.)
67. H. A. Rademacher and A. L. Whiteman: *On Dedekind sums.* (Abstract 46-5-317-t.)
68. Barkley Rosser: *An additional criterion for the first case of Fermat's last theorem.* (Abstract 46-5-320-t.)
69. Max Shiffman: *The Morse relations in the Plateau problem for several boundaries.* (Abstract 46-5-324-t.)
70. A. R. Schweitzer: *Concerning general abstract relational spaces.* (Abstract 46-3-190-t.)
71. D. C. Spencer: *On finitely mean valent functions.* (Abstract 46-5-326-t.)

72. D. C. Spencer: *On finitely mean valent functions*. II. (Abstract 46-5-327-t.)
73. Alvin Sugar: *On a result of Hua for cubic polynomials*. (Abstract 46-5-328-t.)
74. Olga Taussky and John Todd: *On determinants of quaternions*. (Abstract 46-5-330-t.)
75. W. J. Trjitzinsky: *Developments in the analytic theory of algebraic differential equations*. (Abstract 46-5-334-t.)
76. C. W. Vickery: *On cyclically invariant graduation*. (Abstract 46-5-336-t.)
77. T. L. Wade: *Subgeometries of projective geometries as theories of tensors*. (Abstract 46-5-338-t.)
78. H. S. Wall: *A class of power series bounded in the unit circle*. (Abstract 46-5-219-t.)
79. A. D. Wallace: *An analysis of non-alternating transformations*. (Abstract 46-5-339-t.)
80. A. D. Wallace: *On certain classes of subcontinua*. (Abstract 46-5-340-t.)
81. J. L. Walsh: *Note on overconvergent power series*. (Abstract 46-5-220-t.)
82. J. L. Walsh and W. E. Sewell: *On the degree of convergence of harmonic polynomials to harmonic functions*. (Abstract 46-5-341-t.)
83. J. V. Wehausen: *A space isomorphic to Hilbert space*. (Abstract 46-7-370-t.)
84. Louis Weisner: *Moduli of the roots of polynomials and power series*. (Abstract 46-5-343-t.)
85. Louis Weisner: *Power series, the roots of whose partial sums lie in a sector*. (Abstract 46-5-344-t.)
86. D. W. Western: *A method for analytic continuation*. (Abstract 46-5-345-t.)
87. Hassler Whitney: *On regular families of curves*. (Abstract 46-5-348-t.)
88. G. T. Whyburn: *Mapping theorems*. (Abstract 46-5-221-t.)
89. G. T. Whyburn: *On non-alternating transformations*. (Abstract 46-5-222-t.)
90. G. T. Whyburn: *On multicoherence*. (Abstract 46-7-371-t.)
91. G. T. Whyburn: *On singularities and inversion under interior transformations*. (Abstract 46-7-372-t.)
92. G. T. Whyburn: *Transformations on boundary curves*. (Abstract 46-7-373-t.)

T. R. HOLLCROFT,
Associate Secretary