

NOTES

The following two hundred and thirty-seven doctorates, with mathematics, mathematical physics, or statistics as a major subject, were conferred during 1953 in universities in the United States and Canada. The university, month in which degree was conferred, minor subjects (other than mathematics), and title of the dissertation are given in each case if available.

Juliàn Adem, Brown, June, *On the axially-symmetric steady wave propagation in elastic circular rods.*

O. P. Aggarwal, Stanford, June, *Bayes and minimax procedures in sampling from finite populations.*

Bernard Altschuler, New York, February, *Nonlinear buckling of a spherical shell.*

V. L. Anderson, Iowa State, June, *A model for the study of quantitative inheritance.*

F. C. Andrews, California, Berkeley, September, *Asymptotic behavior of some rank tests for analysis of variance.*

Robert Baer, Illinois, October, minor in physics, *Strong ordering in self adjoint operator space.*

R. B. Barrar, Michigan, February, *Some estimates for the solutions of linear parabolic equations.*

J. D. Baum, Yale, June, *Asymptoticity in topological dynamics.*

Jack Bazer, New York, February, *Propagation of plane electromagnetic waves past a shore line.*

V. N. Behrns, Buffalo, June, *Some mathematical aspects of operations research.*

C. B. Bell, Jr., Notre Dame, August, *Structure of measure spaces.*

J. S. Bendat, Southern California, August, *On monotone and convex operator functions.*

S. E. Benesch, Illinois, June, minor in physics, *Theory of nonlinear integral equations with complex-valued singular kernels.*

Paul Berg, New York, June, *On cavitation flow of gases.*

Jerome Berkowitz, New York, June, *Spectral theory of singular differential operators.*

Kurt Bing, Harvard, March, *Definability in the theories of integers and of natural numbers.*

J. F. Blackburn, North Carolina, August, *Steady state temperature distribution between solids and gases under nonlinear boundary conditions.*

R. B. Blake, Florida, January, minor in physics, *The solution of*

certain problems of plane strain in laminated orthotropic structures by means of polynomials.

W. W. Bledsoe, California, Berkeley, June, *Separative measures for topological spaces.*

J. R. Blum, California, Berkeley, June, *Strong consistency of stochastic approximation methods.*

J. W. Brace, Cornell, June, *Transformations on Banach spaces.*

W. H. Bradford, Texas, May, minor in physics, *Sub-biharmonic functions.*

Joseph Bram, Chicago, August, *On subnormal operators.*

R. D. Branstetter, Iowa State, June, *A round-off theory for scalar products.*

W. E. Briggs, Colorado, June, minors in physics and education, *Two new proofs of theorems concerning the representation of prime numbers by binary quadratic forms.*

John Brown, Jr., Brown, June, *On transient heat transfer through a laminar boundary layer.*

M. D. Burrow, McGill, September, *Generalization of method of Young-tableaus in the theory of group representation.*

H. S. Butts, Ohio State, May, *Corresponding residue systems in algebraic number fields.*

G. C. Byers, Duke, June, minor in physics, *Class number formulas for quadratic forms over $GF[q, x]$.*

J. R. Byrne, Washington, Seattle, August, *n -tuple rings and n -ideals.*

C. E. Capel, Tulane, June, *Inverse limit spaces.*

Buchanan Cargal, Iowa State, June, minor in physics, *Generalizations of continuity.*

R. C. Carson, Wisconsin, August, *On functions analytic in an annulus.*

T. Y. Chow, Cornell, February, minor in aerodynamics, *A study of extremal value problems of functions regular in an annulus.*

H. E. Chrestenson, Oregon, June, *A class of generalized Walsh functions.*

C. J. Clark, Oklahoma A and M, June, *Introduction to C-R algebras.*

M. H. Clarkson, Texas, May, *A second-order theory for three dimensional wings in supersonic flow.*

K. G. Clemans, Oregon, June, *Limiting distributions of certain statistics of the Kolmogorov-Smirnov type.*

D. R. Clutterham, Illinois, June, minor in physics, *Interaction of curved shocks.*

Margaret F. Conroy, Brown, June, Part I: *Plastic-rigid analysis of*

long beams under transverse impact loading. Part II: Dynamic transverse loading of beams of a material exhibiting linear strain-hardening.

Mischa Cotlar, Chicago, March, *On the theory of Hilbert transforms.*

G. C. Cree, Washington, St. Louis, June, *A partial differential equation arising in the theory of quasi conformal mapping.*

Frederic Cunningham, Jr., Harvard, June, *L^1 -structure in Banach spaces.*

W. F. Darsow, Chicago, August, *On positive definite functions on locally compact groups and LH^* algebras.*

Anne Davis, California, Berkeley, January, *A study in the arithmetic of order types.*

R. B. Dawson, Jr., Harvard, June, *Unbiased tests, unbiased estimators, and randomized similar regions.*

R. B. Deal, Jr., Oklahoma, August, minor in physics, *Union differentiation and union correspondence in metric differential geometry.*

Richard Dean, Ohio State, December, *On the word problems for lattices and related topics.*

W. E. Deskins, Wisconsin, January, *The role of the parastrophic matrices in the theory of linear associative algebras.*

Alice B. Dickinson, Michigan, February, *Compactness conditions and uniform structures.*

R. C. DiPrima, Carnegie, June, *Vibrations of twisted beams.*

B. M. Drucker, North Carolina, August, *Existence and approximations of solutions of ordinary differential equations.*

D. W. Dubois, Oklahoma, June, minor in physics, *Structure of Archimedean partially ordered fields.*

D. W. Dunn, Massachusetts Institute of Technology, June, minor in aeronautical engineering, *Stability of the laminar boundary layer in a compressible fluid.*

H. P. Edmundson, California, Los Angeles, June, *Statistical estimation of matrix quantities by means of a class of discrete Markov chains.*

M. S. Edwards, Ohio State, August, *The representation problem for surfaces.*

Leon Ehrenpreis, Columbia, April, *Theory of distributions in locally compact spaces. Part I.*

Gertrude Ehrlich, Tennessee, August, *The structure of continuous rings.*

Robert Ellis, Pennsylvania, June, *Continuity and homeomorphism groups.*

M. P. Epstein, Columbia, May, *On the theory of Picard-Vessiot extensions.*

D. H. Evans, Brown, June, *Two problems concerning the measurement of ultrasonic attenuation.*

R. E. Fagen, Minnesota, December, *Certain probability limit theorems and transformations of stochastic processes.*

Jean B. Feidner, Buffalo, June, *Topological properties of a linear neighborhood space.*

H. C. Filgo, Jr., Rice, June, *Uniformizing functions for certain classes of symmetric Riemann surfaces.*

A. B. Finkelstein, New York, February, *The initial value problem for transient water waves.*

Irwin Fischer, Harvard, June, *The totality of curves of genus g .*

R. C. Fisher, Kansas, June, minor in physics, *A study of line congruence by means of a modified tensor analysis.*

J. E. Flanagan, Illinois, June, minor in philosophy, *Topics in information theory.*

L. R. Ford, Jr., Illinois, June, minor in physics, *Transitive homeomorphism groups.*

William Forman, New York, February, *Abstract prime number theorems.*

H. H. Fox, Illinois, June, minor in chemistry, *On approximation of analytic functions.*

K. D. Fox, Brown, June, *On the stability of some flows of an ideal fluid with free surfaces.*

Joel Franklin, Stanford, June, *On the method of successive approximations.*

H. D. Friedman, Pennsylvania State, June, *Topologies on a space of continuous functions.*

C. S. Gardner, New York, June, *Properties of the wave equation related to Huyghen's principle.*

G. H. F. Gardner, Princeton, June, *The concept of a rigid body in special relativity.*

D. C. Gerneth, Oklahoma A and M, June, *On lattice valued metrics.*

Dean Gillette, California, Berkeley, June, *Representable infinite games.*

Leonard Gillman, Columbia, February, *On intervals of ordered sets.*

Seymour Ginsburg, Michigan, February, *Order types and similarity transformations.*

R. D. Glauz, Brown, June, Part I: *Transient wave analysis in linear time dependent material.* Part II: *The viscoelastic vibrating reed.*

Harry Gonshor, Harvard, June, *Spectral theory for a class of non-normal operators.*

S. T. Gormsen, Florida, January, minor in electrical engineering, *Maps of certain algebraic curves invariant under cyclic involutions of periods three, five, and seven.*

Lillian Gough, Buffalo, June, *Logical relations between pairs of prop-*

erties used to define endpoint.

H. C. Griffith, Tennessee, June, *The enclosing of cells in 3-space by simple closed surfaces.*

J. K. Hale, Purdue, May, minor in physics, *On the asymptotic behavior of the solutions of systems of differential equations.*

K. D. C. Haley, Stanford, January, *Estimation of the dosage mortality relationship when the dose is subject to error.*

J. F. Hannan, North Carolina, June, *Asymptotic solutions of compound decision problems.*

H. A. Hanson, Michigan State, June, *Some relations between various types of normality of numbers.*

J. F. Hart, Toronto, June, minor in quantum electrodynamics, *Idealism and realism in the philosophy of science; theory of spin effects in the quantum mechanics of a many-electron atom with special reference to PbIII.*

Joseph Hashisaki, Illinois, June, minor in physics, *On group algebras of prime power groups.*

C. S. Herz, Princeton, June, *Bessel functions of matrix argument.*

J. G. Hocking, Michigan, June, *On approximations to monotone mappings on two-dimensional manifolds.*

W. C. Hoffman, California, Los Angeles, August, *A statistic associated with the joint distribution of N successive amplitudes.*

J. C. Holladay, Yale, June, *Boundary conditions for algebras of continuous functions.*

D. G. Horvitz, Iowa State, June, *Ratio method of estimation in sample surveys.*

L. N. Howard, Princeton, June, *Constant speed flows.*

W. W. Hoy, Ohio State, June, *The estimation of parameters in the Ornstein-Uhlenbeck process.*

J. P. Hoyt, George Washington, May, *Estimates and asymptotic distributions of certain statistics in information theory.*

K. C. Hsu, Kansas, June, minor in physics, *On the Haar functions.*

G. A. Hufford, Princeton, June, *Banach spaces and the perturbation of ordinary differential equations.*

Jack Indritz, Minnesota, August, minor in physics, *Applications of the Rayleigh-Ritz method to the solutions of partial differential equations.*

Shigeru Ishii, Illinois, June, minor in philosophy, *Convergence of open mappings of locally compact spaces.*

H. G. Jacob, Jr., Yale, June, *Lie automorphisms of rings.*

W. E. Johnson, Wisconsin, January, *Asymptotic solutions of a linear second order differential equation with two turning points.*

T. L. Jordan, Vanderbilt, August, minor in physics, *Generalized*

metric lattices and lattices of subgroups.

Irving Kanter, Brown, June, *The response of a strong oblique shock wave to an arbitrary disturbance in the downstream pressure field.*

R. H. Kasriel, Virginia, June, *A study of multiplicity functions.*

Irwin Kay, New York, February, *Direct method for pulse wave diffraction problems.*

N. D. Kazarinoff, Wisconsin, August, *Asymptotic forms for the Whittaker functions of large complex order M .*

D. C. Kleinecke, California, Berkeley, September, *On a class of large perturbations.*

H. A. Knapp, Jr., Massachusetts Institute of Technology, June, minor in physics, *Potentials uniquely determined from their phase shifts in a Schrödinger equation.*

S. G. Kneale, Harvard, June, *Axially symmetric Stokes flows.*

R. J. Koch, Tulane, June, *Topological semigroups.*

R. M. Kozelka, Harvard, February, *On some special order statistics from the multinomial distribution.*

Martin Krakowski, Carnegie, June, *Solution of the Stokes equation for lubrication flows.*

Saul Kravetz, Harvard, March, *On the geometry of Teichmueller manifolds and the structure of the mapping-class group.*

S. H. Lachenbruch, Stanford, January, minor in physics, *Symmetrization in N dimensions.*

E. B. Leach, Massachusetts Institute of Technology, September, minor in physics, *Cohomology theory on complex analytic manifolds.*

T. H. Lee, North Carolina, June, *Matrices with generalized quaternions as elements.*

C. E. Lemke, Carnegie, June, *Extremal problems in linear inequalities.*

J. J. Levin, Massachusetts Institute of Technology, June, minor in physics, *Singular perturbations of non-linear systems of differential equations.*

G. J. Lieberman, Stanford, June, minor in industrial engineering, *Contributions to sampling inspection.*

W. D. Lindstrom, Iowa, August, *Some aspects of an arithmetic theory of algebraic differential equations of first order.*

V. Linis-Linins, McGill, May, *Analysis in nonarchimedean spaces.*

R. F. Link, Princeton, October, *Statistical techniques useful for estimating the mean life of a radioactive source.*

Oscar Litoff, Chicago, August, *The general linear group.*

E. F. Low, Jr., Florida, June, minor in engineering mechanics, *Vertical loading on a straight boundary of an orthotropic plate.*

B. H. McCandless, Indiana, February, minor in physics, *Test spaces for dimension n* .

J. H. McKay, Washington, Seattle, December, *Group extensions by left loops*.

J. D. McKnight, Purdue, January, minor in physics, *On the characterization of rings of functions*.

K. M. McMillin, Cincinnati, June, *Abel summability of the conjugate of the double Fourier series*.

R. W. MacDowell, Michigan, February, *On spaces and algebras of continuous functions*.

S. F. Mack, California, Berkeley, June, *Discontinuities of second derivatives of single-layer potentials*.

Arne Magnus, Washington, St. Louis, January, *Volume preserving transformations in several complex variables*.

Pauline C. Mann, Brown, June, *The interaction of an acoustic wave and an elastic spherical shell*.

Jean-Marie Maranda, McGill, May, *On P -adic integral representations of finite groups*.

J. M. Marr, Tennessee, August, *Continuous images of transfinite intervals*.

A. D. Martin, Washington, St. Louis, June, *Singular quadratic functionals and linear differential equations*.

G. W. Medlin, North Carolina, June, *Some new results on the characteristic roots of matrices*.

Leroy Meyers, Syracuse, June, *Certain transformations of Hermitian functionals*.

Luna Mishoe, New York, June, *On the expansion of an arbitrary function in terms of eigenfunctions of a non-selfadjoint differential systems*.

O. B. Moan, Purdue, May, minor in economics, *The simultaneous distribution of the mean and range in small samples*.

Mabel D. Montgomery, Buffalo, June, *Axioms of topology*.

C. B. Moore, Kentucky, June, *On regression for a compound bivariate surface*.

Marian A. Moore, Purdue, May, *Approximation of ϕ -integrals by Riemann and Darboux sums, and other contributions to the theory of ϕ -integrals in general spaces*.

R. A. Moore, Washington, St. Louis, June, *The behavior of solutions of linear self-adjoint differential equations of the second order*.

P. B. Moranda, Ohio State, June, *Estimation of parameters of the Ornstein-Uhlenbeck and related stochastic processes*.

G. W. Morganthaler, Chicago, June, *The central limit theorem for*

orthonormal systems—the Walsh functions.

W. P. Morse, Florida, August, minor in education, *An analysis of the development of celestial navigation.*

P. S. Mostert, Purdue, August, *Fiberable spaces.*

Shu-Teh S. Moy, Michigan, February, *Applications of conditional expectation.*

Leon Nemesever, New York, February, *On the convergence of finite difference approximations to the solution of systems of quasilinear hyperbolic partial differential equations with singular coefficients.*

J. A. Nohel, Massachusetts Institute of Technology, June, minor in physics, *Stability of perturbed periodic motions.*

Katsumi Nomizu, Chicago, June, *Invariant affine connections on homogeneous spaces.*

Bernard Noonan, McGill, May, *Induced representations of Lie algebras.*

E. S. Northam, Michigan State, June, *Topology in lattices.*

O. T. O'Meara, Princeton, June, *Quadratic forms over local fields.*

Steven Orey, Cornell, September, *Formal development of ordinal number theory and applications to proofs of consistency.*

James Pachares, North Carolina, August, *Distribution of quadratic forms.*

Emanuel Parzen, California, Berkeley, June, *On uniform convergence of families of sequences of random variables.*

Philip Parzen, New York, June, *Propagation of electromagnetic waves in electric beams.*

G. W. Peglar, Iowa, June, *Some results in the theory of multiply homogeneous polynomials.*

E. J. Pellicciaro, North Carolina, June, *A study of critical sets of functions.*

T. S. Pitcher, Massachusetts Institute of Technology, June, minor in humanities, *Sets of positive functions in H -systems.*

R. L. Plunkett, Virginia, June, *Representatives of homotopy classes of mappings into spheres.*

Joseph Putter, California, Berkeley, June, *Contributions to sampling theory and nonparametric hypothesis testing.*

F. D. Quigley, Chicago, December, *On Schubert's formula.*

G. N. Raney, Columbia, October, *Completely distributive complete lattices.*

D. B. Ray, Cornell, June, *Spectra of second order differential operators.*

John Riner, Notre Dame, June, *Topological groups associated with separated uniform and completely regular spaces.*

T. J. Rivlin, Harvard, February, *Overconvergent Taylor series and the zeros of related polynomials.*

R. K. Ritt, Columbia, May, *Spectral theory: rings of functions.*

Louis Robinson, Syracuse, June, *Extension of the Kneser inequality to complexes and a generalization of the degree of mapping.*

M. E. Rose, New York, February, *On the solution of hyperbolic equations by difference methods.*

Lawrence Rosenfeld, Harvard, March, *On distortion at the boundary of a conformal mapping.*

S. L. Ross, Boston, June, *The Cauchy problem for a fourth order parabolic equation by difference methods.*

Hanan Rubin, New York, February, *The dock of finite extent.*

M. F. Ruchte, Wisconsin, January, *Number theoretic properties of the measure density.*

T. L. Saaty, Yale, June, *On the Bessel-Tricomi equation.*

H. E. Salzer, Columbia, February, *A generalization of divided differences with applications.*

D. E. Sanderson, Wisconsin, August, *Isotopic deformations in 3-manifolds.*

R. L. SanSoucie, Wisconsin, May, *Right alternative division rings of characteristic two.*

Anne E. Scheerer, Pennsylvania, June, *Brownian motion and the Green's function—the plane case.*

Harry Schiff, McGill, May, *Theoretical calculations of electron capture cross sections.*

Seymour Shuster, Pennsylvania State, June, *Pencils of polarities in projective space.*

Sol Schwartzman, Yale, June, *On transformation groups.*

R. G. Selfridge, Oregon, June, *Generalized Walsh transforms.*

D. H. Shaffer, Carnegie, June, *Two applications of Bessel functions.*

L. S. Shapley, Princeton, June, *Additive and non-additive set functions.*

R. T. Sharp, McGill, May, *On the diamagnetism of graphite.*

K. S. Shih, Illinois, June, minor in philosophy, *Cohomology of associative algebras and spectral sequences.*

J. R. Shoenfield, Michigan, February, *Models of formal systems.*

J. W. Siry, Maryland, June, minors in electrical engineering and physics, *Chromatic polynomials of large maps.*

Rosedith Sitgreaves, Columbia, March, *Contribution to the problem of classification.*

H. T. Slaby, Wisconsin, October, *Central nilpotency of commutative*

Moufang loops.

J. M. Slye, Texas, May, minor in physics, *Flat spaces for which the Jordan curve theorem holds true.*

W. K. Smith, Michigan, June, *The Banach algebras of continuous mappings from a compact Hausdorff space to a Banach algebra.*

P. N. Somerville, North Carolina, June, *A topic in the sequential design of experiments.*

G. L. Spencer, Michigan, June, *The compressible flow about a pointed body of revolution of curved profile with attached shock wave.*

F. L. Spitzer, Michigan, February, *On the theory of stochastic processes which appear in the description of two dimensional Brownian motion by polar coordinates.*

H. D. Sprinkle, Florida, January, minor in philosophy, *Topology in B-metric spaces.*

V. R. Staknis, Boston, June, *A theorem on rings of continuous functions.*

R. D. Stalley, Oregon, June, *A modified Schnirelmann density.*

S. K. B. Stein, Columbia, January, *The homology of the two-fold symmetric product.*

P. H. Sterbenz, Ohio State, June, *Some topics in cohomology theory.*

E. J. Stewart, Rice, June, *Some properties of a harmonic function in the neighborhood of an isolated singularity.*

F. D. Stockton, Brown, June, *Experimental evidence on non-linearity in plastic stress-strain relations.*

W. E. Strimling, Minnesota, August, minors in chemistry and electrical engineering, *Solution of a linear, second order, partial differential equation in three variables by Weiner integration.*

Irving Sussman, California, Berkeley, June, *Theory of associate rings.*

G. L. Thompson, Michigan, June, *Projective relations in modular lattices.*

R. N. Tompson, Brown, June, *Areas of k dimensional non-parametric surfaces in $k+1$ space.*

B. B. Townsend, Texas, May, minor in chemistry, *Certain metric extensors.*

R. G. Van Nostrand, North Carolina, August, minor in geology, *The theory of direct current prospecting in the presence of curved boundary surfaces.*

Lila P. Walker, North Carolina, August, *The reduction of a matrix to a rational canonical form.*

A. J. Wang, Brown, June, *Plastic flow in a deeply notched bar.*

C. Y. Wang, Minnesota, June, I. *Polynomial approximations to*

solutions of variational problems in the complex domain. II. On the mean convergence of mapping functions in conformal mapping of regions bounded by nearly smooth curves.

L. E. Ward, Jr., Tulane, June, *Partially ordered spaces.*

F. C. Warner, Buffalo, June, *Operations research applied to some problems in education.*

W. H. Warner, Carnegie, June, *Plastic flow laws and their effects on structural stability.*

Edwin Weiss, Massachusetts Institute of Technology, June, minor in humanities, *Bounded topological rings.*

Lionel Weiss, Columbia, January, *On the use of moments in approximation distribution function and expectations.*

Mortimer Weitz, New York, February, *Reflection of water waves.*

Chien Wenjen, California, Los Angeles, August, *A generalization of certain properties of Banach algebras.*

D. G. Wertheim, Toronto, November, *The forms of the linear, continuous functional on certain abstract spaces.*

J. R. Wesson, Vanderbilt, June, minor in physics, *Finite plane projective geometries.*

A. B. Willcox, Yale, June, *Some structure theorems for a class of Banach algebras.*

R. J. Wisner, Washington, Seattle, June, *Rings with given module*

W. D. Wood, Purdue, January, *On functions defined by certain infinite series which converge in a half-plane.*

D. H. Wright, George Washington, April, *Survival probability.*

F. B. Wright, Jr., Chicago, December, *Ideals in operator algebras.*

F. M. Wright, Northwestern, August, *On the backward extension of moment sequences.*

W. S. Wunch, Stanford, June, *The reproduction of an arbitrary function of time by discontinuous control.*

John Zickel, Brown, June, *Pretwisted beams and columns.*

R. E. Zink, Minnesota, August, minor in physics, *Direct unions of measure spaces.*

Michael Yanowitch, New York, February, *Nonlinear buckling of circular elastic plates.*

Aboulghassem Zirakzadeh, Oklahoma A and M, June, *A mapping of Euclidean N -space on the plane.*

The following doctorate was conferred in 1952, but was not included in the list in the preceding volume of this Bulletin (vol. 59, pp. 286–296):

D. D. Strebe, Buffalo, June, *Certain applications of irreducibility to connected Hausdorff spaces.*