

A. ORGANIZATION

General meetings of the department were again held to a small number of special purpose gatherings for the purpose of information, discussion, and consensus decisions. However, many meetings of tenured faculty and other special subgroups were held for the purpose of decisions on promotion and tenure.

B. COLLOQUIA AND FACULTY SEMINARS

- Charles Megibbon, Vanderbilt University: "Abelian Groups."
Robert J. Wisner, NMSU: "Games in Geometry."
Ron Nunke, University of Washington: "Abelian Groups."
Henry Cheng, NMSU: "The Constructivism of Errett Bishop" and "Some Open Problems in Constructive Analysis."
Paul Hill, Florida State University: "On the Freeness of the Bounded Sequences of Integers and Other Groups."
Charles Swartz, NMSU: "Topics from Linear Operator Theory."
Joel L. Brenner, University of Arizona: "Covering Theorems for Finite Groups."
John Selfridge, University of Northern Illinois: "Factorization and Primality Testing."
Andy Magid, Columbia University: "Galois Theory of Commutative Rings."
L. Fuchs, Tulane University: "Abelian Groups."
R. E. Kalman, University of Florida: "Dronecker Invariants and Feedback."
Ray Mines, NMSU: "Constructive Analysis."
John Irwin, Wayne State University: "Abelian Groups."
Norma Hernandez, University of Texas at El Paso: "Mathematics for Bicultural Students."
D. S. Scott, Princeton University: " T_0 -Spaces Can be Interesting."
C. Y. Shen, Simon Fraser University: "The Exponential of a Measure Space and Its Application."
Glenadine E. Gibb, University of Texas at Austin: "Through the Eyes of Our Students."
Gordon Berg, NMSU: "An Elementary and Constructive Proof of the Jordan Curve Theorem."
Irvin Vance, NMSU: "Informal Geometry Via the Geoboard."
Richard Griego, University of New Mexico: "Probabilistic Solutions of Hyperbolic Differential Equations."
Harvey J. Greenberg, Southern Methodist University: "Continuity Properties of Mathematical Programs."

Seminars involving faculty and students were held regularly during the year on the following topics: Constructive Analysis, Topics in Analysis, Abelian Groups, Algebraic Topology, Sheaf Theory, Geometry, and Torsion Free Abelian Groups.

With partial support from the National Science Foundation, the ninth annual NMSU Holiday Symposium in Mathematics was held during

the period December 27-31. The featured lecturer was Professor Herman Chernoff of Stanford University. A total of 67 mathematicians representing 31 universities, including 26 special guest participants, attended.

C. UNDERGRADUATE SCHOLARSHIPS

Physical Science Laboratory	4
Department Funds	13

D. IMPROVEMENTS

Instruction

During the past year, most of the faculty and teaching assistants gathered student evaluations of their courses. Three evaluation forms were made available by the department, and the student responses offered evidence of general good teaching in mathematics.

Increased efforts were made to coordinate the various sections of service courses, and plans have been made to intensify these efforts in the coming year. In particular, teaching assistants will be provided even more careful guidance and supervision of their instruction in the 1972-73 academic year.

Communication with faculty of other colleges whose programs require mathematics was increased. A major accomplishment of the joint Engineering-Mathematics Calculus Committee was the careful selection of a new calculus text which promises to improve vastly the four-course calculus sequence. A joint Business-Mathematics Committee was formed and met frequently to discuss the content and instruction of the mathematical courses required of majors of the College of Business Administration and Economics.

Plans for teaching the mathematics course sequence for students in business and the behavioral sciences via a Mathematics Learning Center are nearly complete. This entire project, which is a major instructional innovation, has progressed very well during the year.

Curriculum

Although the entire mathematics curriculum is under constant review, several notable improvements include:

1. A new, graduate-level survey course in applied mathematics for majors in sciences and engineering--Math 470;
2. A new five-course sequence of mathematics courses tailored for the four-year engineering technology program;
3. An extensive offering of Interim courses;
4. A series of workshop-courses made available to teachers throughout the State;
5. Efforts in constructive mathematics on the graduate level.

Library

Keith Phillips and David Arnold continue to manage the departmental reading room. A total of 150 new books were ordered this past year, and approximately 10 new journals were added to the collection.

Advisor-Advisee Relations

Although several members have continued to improve advising in the department, the most significant advising change was initiated by the College Curriculum Committee, with the full support of this department.

G. PROFESSIONAL SERVICE

David Arnold

High School Visitation Program.
Referee for Pacific Journal of Mathematics.
Referee for Proceedings of the American Mathematical Society.
Referee for Rocky Mountain Journal.

Richard Bagby

Supervisor, Putnam Examination, Mathematical Assoc. of America.

Eldon Boes

High School Visitation Program.
Calculus Committee.

Henry Cheng

Faculty Advisor, Chinese Students Association.

John DePree

Member, Board of Directors, Pacific Journal of Mathematics.
Referee for Pacific Journal.
Reviewer for Mathematical Reviews.
Reviewer for Zentralblatt fur Mathematik.

Edward Gaughan

Calculus Committee.
Las Cruces Public Schools Retread Program.

William Julian

Reviewer for Mathematical Reviews.
Workshops for Teachers.

Joseph Kist

Referee for National Science Foundation.
Referee for Pacific Journal of Mathematics.
Referee for Canadian Journal of Mathematics.
Referee for Australian Mathematics Society.
Referee for Mathematische Annalen.
Reviewer for Mathematical Reviews.
Reviewer for Zentralblatt fur Mathematik.

Warren Krueger

Las Cruces Public Schools Retread Program.
Reviewer for Zentralblatt fur Mathematik.

Wolfgang Liebert

Faculty Sponsor, Soccer Club.
Reviewer for Zentralblatt fur Mathematik.

Joaquin Loustaunau

Chairman, Advisory Board, Special Students Program.
Committee for Minority Training in Sciences (Physics Society).
Reviewer for Mathematical Reviews.

Mark Mandelker

Referee for Canadian Journal of Mathematics.
Referee for National Science Foundation.
Reviewer for Mathematical Reviews.
Reviewer for Zentralblatt fur Mathematik.

Ray Mines

Reviewer for Mathematical Reviews.
Member, Advisory Council for Chicano Coordinator.

Keith Phillips

Reviewer for Mathematical Reviews.
Reviewer for Zentralblatt fur Mathematik.
Reviewer for American Mathematical Society.
Reviewer for Studia Mathematica.

Paul Randolph

Associate Editor, Operations Research.
Referee for Journal of Mathematical Sociology.

Fred Richman

Referee for Pacific Journal of Mathematics.
Referee for Rocky Mountain Journal of Mathematics.

John D. Thomas

Reviewer for Zentralblatt fur Mathematik.

Irvin E. Vance

Ethnic Coordinator for NMSU.
Reviewer for The Mathematics Teacher.
Reviewer for The Journal on Research in Mathematics Education.

Carol Walker

Referee for Rocky Mountain Journal of Mathematics.
Referee for Pacific Journal of Mathematics.

Elbert Walker

Reviewer for Mathematical Reviews.
Reviewer for Zentralblatt fur Mathematik.
Editor, Rocky Mountain Mathematics Journal.
President and Member of Board of Governors, Rocky Mountain Mathematics Consortium.
CUPM Consultant.

John Werth

Faculty Advisor, Pi Mu Epsilon.
Reviewer for Mathematical Reviews.

Robert J. Wisner

Member, New Mexico Educational Coordinating Council.
Member, Commission on Pre-service Education of Teachers of Mathematics of The National Council of Teachers of Mathematics.
Member, National Evaluation Committee; Chairman, Mathematics Advisory Committee; Consultant, Mathematics Project for The University of Wisconsin Center for Research and Development in Cognitive Learning.
Consulting Editor, Contemporary Undergraduate Mathematics Series, Brooks/Cole Publishing Company.
Editorial Advisor, Scott-Foresman and Company.

Joseph D. Zund

Reviewer for Mathematical Reviews.
Reviewer for Zentralblatt fur Mathematik.
Referee for Australian Mathematical Society.
Referee for Rocky Mountain Journal of Mathematics.

Workshop Program

The department continued its program of offering workshops for in-service teachers at locations throughout the State. This year, 11 different workshops were offered in Farmington, Las Cruces, Hobbs, Grants, Santa Fe, Deming, and Espanola. In these, 202 teachers earned a total of 404 credit hours.

Response to this program (with its underlying philosophy of offering in-service training with a maximum of convenience to the teacher and with a genuine effort to respond to mathematical needs when, where, and as they actually exist) has been enthusiastic.

It is clear that our efforts have uncovered a real need for this service and that, if allowed to, this program will continue to grow. Certainly the kudos from workshop participants indicate satisfaction with the efforts. Comments from teachers and administrators have occurred regularly: inquiries about the availability of such workshops in subject areas other than mathematics, criticism of the Las Cruces campus summer schedule which forces in-service teachers into the (often over-crowded) second six-week session, and

administrative roadblocks concerning grades, credits, and transcripts. Apparently, NMSU could be of greater service to the teachers of the State it is designed to serve.

H. PROFESSIONAL MEETINGS ATTENDED

David Arnold

Association for Computing Machinery Conference (national).

Richard Bagby

78th Annual Meeting, American Mathematical Society (national).
Southwestern Section, Mathematical Association of America
(regional).

Gordon Berg

78th Annual Meeting, American Mathematical Society (national).
Southwestern Section, Mathematical Association of America
(regional).

Eldon Boes

NCTM Name of Site Meeting (regional).
Conference on Mathematics (regional).
Southwestern Section, Mathematical Association of America
(regional).
NMSU Holiday Mathematics Symposium (national).

Henry Cheng

78th Annual Meeting, American Mathematical Society (national).
Southwestern Section, Mathematical Association of America
(regional).
NMSU Holiday Mathematics Symposium (national).

John DePree

78th Annual Meeting, American Mathematical Society (national).
Pacific Journal Board of Governors (national).

Edward D. Gaughan

78th Annual Meeting, American Mathematical Society (national).
Southwestern Section, Mathematical Association of America
(regional).
NMSU Holiday Mathematics Symposium (national).

John B. Giever

NMSU Holiday Mathematics Symposium (national).

Linda Hill

78th Annual Meeting, American Mathematical Society (national).

Donald G. Johnson

Conference on Mathematics (regional).

American Mathematical Society; Mathematical Association of America
(regional).
Southwestern Section, Mathematical Association of America
(regional).
50th Annual Meeting, National Council of Teachers of Mathematics
(national).

William Julian

78th Annual Meeting, American Mathematical Society (national).
NMSU Holiday Mathematics Symposium (national).

Joseph Kist

78th Annual Meeting, American Mathematical Society (national).

Warren Krueger

NMSU Holiday Mathematics Symposium (national).

Arthur Kruse

78th Annual Meeting of the American Mathematical Society (national).
NMSU Holiday Mathematics Symposium (national).

Margarita Langlois

78th Annual Meeting, American Mathematical Society (national).
NCTM Name of Site Meeting (regional).
NMSU Holiday Mathematics Symposium (national).

Joaquin Loustaunau

Southwestern Section, Mathematical Association of America
(regional).
NMSU Holiday Mathematics Symposium (national).

Mark Mandelker

78th Annual Meeting, American Mathematical Society (national).
NMSU Holiday Mathematics Symposium (national).

Ray Mines

78th Annual Meeting, American Mathematical Society (national).
Southwestern Section, Mathematical Association of America
(regional).

Paul Randolph

78th Annual Meeting, American Mathematical Society (national).
Joint Conference on Major Systems-Operations Research (national).
NMSU Holiday Mathematics Symposium (national).

Fred Richman

NMSU Holiday Mathematics Symposium (national).

Gerald Rogers

American Statistical Association and Institute of Mathematical
Statistics (regional).
Conference on Mathematics (regional).
NMSU Holiday Mathematics Symposium (national).

Clarence Smith

NCTM Name of Site Meeting (regional).

John D. Thomas

78th Annual Meeting, American Mathematical Society (national).

Irvin E. Vance

78th Annual Meeting, American Mathematical Society (national).

Carol Walker

78th Annual Meeting, American Mathematical Society (national).

Elbert Walker

78th Annual Meeting, American Mathematical Society (national).
Southwestern Section, Mathematical Association of America
(regional).
NMSU Holiday Mathematics Symposium (national).

James Ward

78th Annual Meeting, American Mathematical Society (national).
NMSU Holiday Mathematics Symposium (national).

John Werth

Conference with National Science Foundation.
78th Annual Meeting, American Mathematical Society (national).
NMSU Holiday Mathematics Symposium (national).

Robert J. Wisner

New Mexico Coordinating Council of Secondary Schools and Colleges
(regional).
Conference with National Science Foundation.
78th Annual Meeting, American Mathematical Society (national).
NCTM Name of Site Meetings (regional).
Conference on Mathematics (regional).
50th Annual Meeting, National Council of Teachers of Mathematics
(national).
NMSU Holiday Mathematics Symposium (national).
Southwestern Section, Mathematical Association of America
(regional).

Dennis Young

Third International Symposium on Multivariate Analysis
(international).
NMSU Holiday Mathematics Symposium (national).

I. RESEARCH PAPERS PUBLISHED

- Bagby, Richard, "Lebesgue Spaces of Parabolic Potentials," Illinois Journal of Mathematics.
- Cheng, Henry, "Constructive Measure Theory," (with E. Bishop) American Mathematical Society Memoir 116.
- Cheng, Henry, "A Constructive Riemann Mapping Theorem," Pacific Journal of Mathematics.
- Gaughan, Edward D., Introduccion al Analisis, Editorial Alhambra, S.A., Madrid, Spain.
- Johnson, Donald G., "Rings of Quotients of ϕ -Algebras," Pacific Journal of Mathematics.
- Johnson, Donald G., "Separating Chains in Topological Spaces," (with Mark Mandelker) Transactions of the London Mathematical Society.
- Kist, Joseph, "Functions of Bounded Variation on Semi-Lattices," (with P. Maserick) Pacific Journal of Mathematics.
- Krueger, Warren, "Higher Order Homology Operations and the Adams Spectral Sequence," Proceedings of the American Mathematical Society.
- Liebert, Wolfgang, "Characteristics of Endomorphism Rings of Modules Over Complete Valuation Rings," Pacific Journal of Mathematics.
- Mandelker, Mark, "Supports of Continuous Functions," Transactions of the American Mathematical Society.
- Rogers, Gerald S., "On Ordered Functions," (with R. Borges).
- Swartz, Charles, "Convergence of Convolution Operators," Studia Mathematica.
- Swartz, Charles, "Random Functions on $K\{M_p\}$ Spaces," (with D. E. Myers) Studia Mathematica.
- Vance, Irvin E., "Geometry (Recent Trends in the United States and Some Recommendations for Grades K-12)," Reports of the U.S.-Japan Seminar on Mathematics Education.
- Walker, Carol, "Relative Homological Algebras for Abelian Groups," Proceedings of the 1971 Rice University Algebra Colloquium Series.
- Walker, Elbert, "Divisible Quotient Groups of Reduced Abelian Groups," Rocky Mountain Mathematics Journal.
- Williams, Francis D., "Certain Exotic Multiplications on Generalized Eilenberg-MacLane Spaces," Quarterly Journal of Mathematics.
- Young, Dennis, "Approximate TO Distributions of Largest Root," (with K. C. S. Pillai) Annals of the Institute of Statistical Mathematics.
- Zund, Joseph D., "The Theory of Bivectors," (with E. A. Brown) Tensor New Series.
- Zund, Joseph D., "A Note on the Classification of Electromagnetic Fields," (with G. C. Debney) Tensor New Series.
- Zund, Joseph D., "On the Euler-Poincare Characteristic of Conformally Related Riemannian Manifolds," Rendiconti del Circolo Matematico di Palermo.
- Zund, Joseph D., "A Special Class of States of Total Pure Radiation in General Relativity," Tensor New Series.

J. RESEARCH PAPERS PRESENTED

- Boes, Eldon C., "The Game of Hex," 50th Annual Meeting, NCTM (national).
- Gaughan, Edward D., "Applications Before the Fact," 50th Annual Meeting, NCTM (national).
- Knoebel, Arthur, "The Composition of Threshold Functions," American Mathematical Society (regional).
- Randolph, Paul, "A Scheduling Problem," University of Texas (regional).
- Randolph, Paul, "Ballistic Missile Defense Model," Operations Research Society of America (national).
- Randolph, Paul, "Multinomial Stopping Rules," Louisiana State University (regional).
- Randolph, Paul, "Improving Monte Carlo," 18th Conference of Army Mathematicians (national).
- Smith, Clarence, "Partner Learning," Panel on Research in Mathematics Education, 50th Annual Meeting, NCTM (national).
- Williams, Francis, "Quasi-Commutativity of H-Spaces," American Mathematical Society (regional).
- Vance, Irvin E., "Geometry," National Council of Teachers of Mathematics (regional).
- Vance, Irvin E., "Accentuating the Inductive in Geometry," New Mexico Council of Teachers of Mathematics (regional).
- Vance, Irvin E., "Geometry: For What," National Council of Teachers of Mathematics (regional).
- Vance, Irvin E., "The Circular Functions Via Wood and String," 50th Annual Meeting, NCTM (national).
- Wisner, Robert J., "The Capricious Primes," National Council of Teachers of Mathematics (regional).
- Wisner, Robert J., "The Jack S. Haines Memorial Lecture," Southwestern Section, Mathematical Association of America (regional).
- Wisner, Robert J., "Capricious Primes," National Council of Teachers of Mathematics (Ft. Lauderdale) (regional).
- Wisner, Robert J., "Fractions and Primes," National Council of Teachers of Mathematics (Beaumont) (regional).
- Wisner, Robert J., "Geometry and Numbers," National Council of Teachers of Mathematics (Columbus) (regional).
- Wisner, Robert J., "Numbers and Nonsense," North Carolina Council of Teachers of Mathematics (regional).

K. PUBLICATIONS OF ALUMNI

- Alexander, George, "Banach Spaces Possessing a Radon-Nikodym Property," Review Roumanian Mathematics Pure & Applied.
- Bertholf, Dennis, "Commutative Rings for Which Each Proper Homomorphic Image is a Multiplication Ring," (with C. Wood) Hiroshima Mathematics Journal.
- Cook, Donald, "The Text: Is It There or Is It There," 10th Northwest Mathematics Conference.

Horner, Donald, Introductory Calculus, Holt, Rinehart and Winston.
 Horner, Donald, Trigonometry: A Study of Certain Real Functions,
 D. J. Publishing Company.
 Peake, E. James, "Extension of Algebraic Theories," (with Galen
 Peters) Proceedings of the American Mathematical Society.
 Sember, John J., "Sections of Sequences in Matrix Domains," (with
 G. Bennett and A. Wilansky), Transactions of New York Academy
 of Sciences.
 Walden, William E., "On-line Computer Control," Educational Media.
 Walden, William E., "A Computer Assisted Study of GO on M X N
 Boards," (with E. Thorp) Information Sciences.
 Walden, William E., "A System Structure and Data Structure for an
 Interactive On-line Thesaurus," (with Rickman) Proceedings of
 the 1972 Joint Computer Conference.
 Whitley, Robert J., "Poincare's Conjecture and the Distribution of
 Digits in Tables," (with E. Thorp) Compositio Mathematica.
 Whitley, Robert J., "Partially Bounded Sets of Infinite Width,"
 (with E. Thorp), Journal fur die reine und angewande
 Mathematik.
 Whitley, Robert J., "Oscillation of an Operator," Transactions of
 the American Mathematical Society.

M. PROPOSALS AND GRANTS

Proposals Pending

Henry Cheng
 Gerald Rogers
 Elbert Walker (and others)
 Joseph Zund
 Paul Randolph

Grants

Mark Mandelker	\$ 10,800
Elbert Walker (and others)	27,700
Gerald Rogers	7,500
Robert Wisner	108,000
Francis D. Williams	10,600

N. CRITICAL ANALYSIS

This academic year was the final year of the National Science Foundation Departmental Development Grant. As stated in the final report which will be submitted to the National Science Foundation, the department has not yet achieved the growth envisioned in the proposal which led to the grant. However, in light of available resources and changes in societal and university goals, the achievements of the department have amounted to a reasonable approximation to the goals envisioned. Be that as it may, there remains the considerable task of consolidating the gains made under the development grant while continuing to strengthen the department. A

departmental statement of long-range goals was developed and adopted by the department during the year as a guide to follow in developing new strengths in research, service, and teaching. Although our attention to the students and to the citizenry of the State has increased, continued public service efforts are necessary because support is derived from tax dollars. The university administration has signalled its determination to see a continuation of mathematical excellence, and the department must respond by meeting the needs of the educational enterprise that is New Mexico State University.