

A. ORGANIZATION

Departmental meetings were kept to a minimum during the year, with no regular schedule for meetings. Departmental meetings could best be described as "special purpose meetings"--generally of short duration--for the purpose of discussion, information, and consensus decisions.

B. COLLOQUIA AND FACULTY SEMINARS

- Linda Hill, University of Rochester: "Converses to Certain Famous Theorems in Valuation Theory."
Edwin Oxford, New Mexico State University: "Radicals and Topologies on Abelian Groups."
Dwight B. Brock, Southern Methodist University: "Statistical Inference for Markov Renewal Processes."
Ann Griesel, University of California at Riverside: "Some Results in Approximation Theory."
Adriano Garsia, University of California at San Diego: "Smoothness of Functions Satisfying Certain Integral Inequalities."
Dick Emmons, Robertson High School, Las Vegas, New Mexico: "Individualized Instruction in High School Mathematics."
John D. Thomas, New Mexico State University: "How to Calculate: Some Examples of Algorithm Design."
Arthur Krener, University of California at Berkeley: "Optimal Control and/or Differential Geometry."
Stanley Steinberg, Purdue University: "Partial Differential Equations."
Peter Maserick, New Mexico State University: "BV Functions on Commutative Semi-Groups."
Bernard Epstein, University of New Mexico: "Some Applications of the Schwarz Inequality."
John Higgins, New Mexico State University: "Collectively Compact Sets of Linear Operators."
Stephen Gersten, Rice University: "The Quest of Higher K-groups."
Arthur Kruse, New Mexico State University: "On a Certain Mathematical Theorem."
Elliott Organick, University of Houston: "File Systems Structure in Multics."
G. Simmons, Rolamite, Inc., Albuquerque: "A New Topic in the Theory of Graphs."
Charles Stewart, Oklahoma State University: "Multiple Tests of Hypotheses and Some Simulation Techniques."
Anthony W. Hager, Wesleyan University: "A Class of Uniform Spaces, and Theorems of Stone-Weierstrass Type."
Julius Hlavaty, DeWitt Clinton High School, Past President of NCTM: "Problems in Mathematics Education Today."
Mitchell Taibleson, Washington University: "A.E. Convergence and Multipliers."
Patrick L. Odell, Texas Technological University: "The p-q Generalized Inverse and Minimum Variance Estimation."

Thomas J. Head, The University of Alaska: "Commutative Semi-Groups and their Tensor Products."
 Colin Clark, University of British Columbia: "On Rellich's Lemma."
 Satish Shirali, New Mexico State University: "Complex Involutory Banach Algebras."

Seminars involving faculty and students were held regularly during the year on the following topics:

Universal Algebra	Functional Analysis
Testing and Estimation	Ring Theory
Constructive Analysis	Abelian Groups
Topics in Analysis	Algebraic Topology
K-Theory	Point Set Topology

The eighth annual NMSU Holiday Symposium in Mathematics was held during the period December 27 to December 31. The featured lecturer was Professor Samuel Eilenberg of Columbia University. A total of 90 mathematicians registered for the symposium, a group representing more than 20 universities in 12 states.

C. UNDERGRADUATE SCHOLARSHIPS

Physical Science Laboratory 2
 Department funds13

D. IMPROVEMENTS

The department has long had a student evaluation form for use by faculty members who wish to gauge the judgment of students concerning their teaching. A new form is now in the making, and while no plans for the regulated use of these forms have been formulated, they are also in the making.

There have been renewed and various efforts to improve the teaching of service courses. In particular, there have been active and rewarding dialogues conducted with members of other departments who require from their students a segment of mathematics, and while there has been certain satisfaction resulting from these conversations, a greater emphasis on this area will be pursued during the coming year. The Department of Mathematical Sciences recognizes its duty to the university community to provide the scope, coverage, and depth of service course offerings with particular attention to the manner in which service courses are taught.

The curriculum in mathematics for students in business and social sciences has been revised under a \$108,000 grant from the National Science Foundation to Dr. Harlley McKean, principal investigator. The

offerings for these students are now being taught by a self-paced instructional technique being developed and tested by Dr. McKean and his several associates. In addition to this, more attention is being paid to the undergraduate curriculum, and there is no doubt that changes will occur in the near future. Since it is difficult to separate curriculum and teaching in many instances, it is noted here that there have been appointed course coordinators, whose job it is to keep in touch with various sections of a common course to see that the coverage is reasonably uniform and that the teaching is being conducted at a high level of competence. Since both curriculum and teaching are hardly subjects for quantification, no measures of the effects of these efforts are available, but in the judgment of those taking part in these coordinate activities, considerable progress has been made.

The departmental reading room holdings have been enlarged and improved. In the past year, the number of books increased from some 1,600 volumes to over 2,000. Bound volumes of research journals of widest use are available for ready reference, and the room boasts of current issues of 85 research journals. The Mathematical Reviews are now available in the reading room for every issue since 1940.

Advisor-advisee relations continues to be a perplexing subject for concern. The students seem increasingly desirous of making independent, individual judgments; a good many students eschew attempts by faculty advisors to guide them by the hand. It would seem this is an area where some university-wide changes in procedure should be instituted, and it is doubted that a piecemeal approach by individual departments will result in much of a pay-off for the university community as a whole.

E. PROFESSIONAL SERVICE

Listed here are the more important and outstanding professional services of the faculty. Since faculty members are asked quite frequently to review research papers for various professional journals, these and related activities are not included; however, they may be presumed to be a part of the professional life of department members in general. Among the more important related activities are contributions made by various members in terms of refereeing proposals for the National Science Foundation and for other government or private granting agencies, requests by commercial publishers for reviewing and refereeing manuscripts submitted to them for publication, service on ad hoc committees of professional organizations, etc.

Arnold, David M.

Workshops for Teachers.

Boes, Eldon C.

Speaker, High School Visitation Program.

Workshops for Teachers.

DePree, John D.

Reviewer for Mathematical Reviews.

Reviewer for Zentralblatt fur Mathematik.

Head, Thomas.

Workshops for Teachers.

Johnson, Donald G.

Workshops for Teachers.

Speaker, High School Visitation Program.

Kist, Joseph E.

Reviewer for Mathematical Reviews.

Reviewer for Zentralblatt fur Mathematik.

Krueger, Warren M.

Workshops for Teachers.

Loustaunau, Joaquin

Reviewer for Mathematical Reviews.

Mandelker, Mark

Visiting professor, Berbeck College, University of London, Summer 1970.

Reviewer for Mathematical Reviews and Zentralblatt fur Mathematik.

McKean, Harlley E.

Associate Editor of Technometrics.

Mines, Ray

Reviewer for Mathematical Reviews.

Phillips, Keith

Reviewer for Mathematical Reviews and for Zentralblatt fur Mathematik.

Richman, Fred

Associate chairman, Department of Mathematical Sciences.

Rogers, Gerald S.

Director, Holiday Mathematics Symposium.

Swartz, Charles

Reviewer for Mathematical Reviews.

Workshops for Teachers.

Thomas, John D.

Pi Mu Epsilon Faculty Sponsor.

Reviewer for Zentralblatt fur Mathematik.

Walker, Elbert A.

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

Werth, John

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

Wisner, Robert J.

Member of NMSU Committees: Annual Report Committee, Press Committee,
Teacher Education Council.
NCATE Evaluation Team.
Member, University of Wisconsin Research and Development Center for
Cognitive Learning (National Advisory Committee; chairman, Mathematics
Policy Review Board; Consultant to the Individually Guided Instruc-
tion Mathematics Program).
NCTM Commission on the Pre-graduate Training of Teachers of Mathematics.
Consulting Editor, Contemporary Undergraduate Mathematics Series,
Brooks/Cole Publishing Company.
Consultant and Advisor in Mathematics, Scott-Foresman Publishing Co.
Speaker in High School Visitation Program.
Workshops for Teachers.

Young, Dennis

Consultant for Regional Office for the Deaf.

Zund, Joseph D.

Workshops for Teachers.

Retread Program

In the summer of 1970, the department embarked upon a program to improve the quality of junior high school mathematics teaching in the Las Cruces Schools. Although much attention has been paid to the mathematics training of elementary teachers and training of senior high school mathematics teachers, there is need for some special efforts in the junior high school. The program, funded by the Las Cruces Public Schools, is designed to offer experienced elementary and junior high school teachers an opportunity to become familiar with the modern junior high school mathematics curriculum and to study modern mathematics related to that curriculum. The course of study calls for eight semester hours credit in each of three summers and three semester hours credit in each of the academic years 1970-71 and 1971-72. Those who successfully complete the program will be qualified to be certified as junior high school mathematics teachers. At the present time, there are 11 participants in the program.

Branch Colleges

Professors Wisner and Boes visited each of the four branch colleges in the fall term, and while plans were made to make return visits in the spring term, circumstances prohibited such plans from being carried out. It is extremely important that the offerings at the branch colleges fit hand-in-glove with the corresponding offerings on the main campus, and to this end, efforts will be increased to work ever more closely with the mathematics staffs at the branch colleges.

Workshop Program

For several years, the Department of Mathematical Sciences has offered in-service courses for teachers on the Las Cruces campus. This program has included courses taught during the school year, as well as short courses taught during the summer. Beginning in the fall of 1970, a concerted effort was made (and continues to be made) to offer in-service instruction for teachers wherever and whenever (in New Mexico) interest warrants. To date, the course offerings under this program have taken the following forms: 12-week, 3-credit, one meeting per week courses during the school year; 2-week, 1-credit workshops during the interim session; and 2-week, 2-credit workshops during the summer.

Courses and/or workshops were given in the following New Mexico cities: Farmington (2), Los Alamos (1), Espanola (2), Santa Fe (2), Albuquerque (2), Hobbs (2), Deming (2), Las Cruces (3). In these, 189 teachers enrolled for a total of 382 credit hours, of which 305 were earned by elementary teachers and 77 were earned by secondary teachers.

Two features of the program warrant special mention. First, all courses are taught by regular faculty members of the Department of Mathematical Sciences. Second, the underlying philosophy of the program is to help the in-service teachers of New Mexico meet their mathematical needs as they actually exist. (For this reason, course content has usually been determined largely by the class members.)

Response to the program has been enthusiastic, and it appears each successful offering leads to further opportunities. For example, of this year's 16 offerings, three were in response to requests from local people: one from a director of secondary education for the school district, one from a group of teachers, and one from a local higher education official. All of these requests came in communities where the department had already offered one course or workshop. In all cases, course offerings were made only with the cooperation of local school officials.

It is apparent that our efforts have uncovered a real need for this service and that, if allowed to, this program will grow. It should be noted that nine members of the department were willing to donate the two weeks of the interim session to this activity, and that substantially

more than one-half of the members of this department have expressed willingness to participate.

High School Visitation Program

One of the several state service programs launched by the department during the past school year was the High School Visitation Program. While returning from a visit to Deming High School in the spring of 1970, Dr. Boes and Dr. Wisner dreamed aloud about giving talks to the mathematics classes in all of the other high schools of New Mexico in the upcoming academic year. A single clause summary of the success of the High School Visitation Program is easy to give: the dream has been fulfilled.

The goals of the High School Visitation Program are embodied in the term "state service." Briefly, through this program, the Department of Mathematical Sciences hoped to: (1) give to the high school students of New Mexico an excitement in and appreciation of mathematics, (2) meet the high school mathematics teachers of the state, (3) learn about the capabilities and shortcomings of the mathematics programs in New Mexico's high schools, and (4) learn how New Mexico State University might better serve the mathematics teachers in our high schools.

The arrangements for each visit were made by a telephone call from the department to the head mathematics teacher at the particular high school in question. The mathematics professor making the call would request permission to speak before the upper-level mathematics classes. Normally, the visiting professor would spend about 45 minutes of the class period discussing some particularly interesting topic in mathematics; the remainder of the period was reserved for answering questions about college mathematics. An attempt was made to spend at least 30 minutes visiting with the local high school mathematics teachers and learning about their problems. At almost every high school, the lecture and lecturer were very well received. In fact, after the first lecture at many of the high schools, the local mathematics teacher would request that the visitor stay and give several more lectures than had been arranged in advance. Two examples of this were Springer High School where Dr. Johnson talked to five different mathematics classes, and Albuquerque Academy where some students listened to Dr. Boes for four hours straight.

The High School Visitation Program was coordinated by Dr. Boes; the bulk of the visits were made by Dr. Boes (66 high schools) and Dr. Johnson (38 high schools). The entire department helped in the program by taking over the duties for the visitors during their absences. In all, approximately 7,337 students listened to a total of 330 lectures under this program.

The cost of the program was approximately \$3,230. It was possible to visit so many schools with such a small expenditure because the visitors

collected only as much as they spent on their trips, rather than collecting the full \$20 per diem allowed by the university, and seldom was the full 10¢ per mile allowance requested. Thus, the program was in fact partly subsidized by the participating faculty.

The major successes of the program are difficult to describe. They include such things as observing students excited about things they had never seen or understood before, or seeing high school administrators and teachers glowing with appreciation for the fact that some of the state's professors are interested in them and their work. Some visible effects have been noticed, however. The In-Service Teacher Workshop Program is at least partly an outgrowth of the High School Visitation Program. During the freshman orientation session held on June 21, approximately three-fourths of the new freshmen math majors in attendance had heard lectures by one of the visiting mathematics professors. Moreover, nearly every high school mathematics teacher in New Mexico is now known to the faculty of the Department of Mathematical Sciences.

Complaint Office

The department offers many service mathematics courses--courses in mathematics designed for students majoring in other disciplines. As is nearly always the case in such a situation, there are many complaints by students and faculty about these courses. Unfortunately, most of these complaints go to other faculty members, secretaries, deans, room-mates, etc. In the fall of 1970, the department established a Complaint Office to attempt to receive more of these complaints and suggestions about mathematics courses. The Complaint Office was run by Dr. Boes; it promised both anonymity and an objective appraisal of their objections to particular mathematics courses or mathematics instructors to students who complained.

In all, objections or suggestions from approximately 100-150 students on approximately 40-50 different occasions were received. Favorable comments about individual instructors were transmitted to the instructor. Objections to courses or instructors were discussed with the student objectors. In the majority of these latter cases, the students' objections were discussed with the individual instructor or with those faculty members responsible for the course. Some of the results include such things as giving overloaded instructors additional assistance, removing some instructors from courses which they were not particularly suited to teach, and, very often, making suggestions to instructors on how they might improve the problematic situation.

Although the Complaint Office did not receive nearly as many student responses as expected, its establishment seems to have been worthwhile. The Department of Mathematical Sciences plans to use the Complaint Office again in the upcoming year and to publicize its existence and function much more widely.

Free Tutoring Service

In order to offer more assistance to students enrolled in any of the numerous lower-level math courses, the department provided a free tutoring service which started in February. This assistance was available to any students in courses numbered below 400, between the hours of 1 and 5 p.m. daily in a seminar room in Walden Hall. The tutoring was performed by three graduate assistants as part of their teaching duties. Since fairly heavy use was made of this service during the spring semester, it will be continued.

F. PROFESSIONAL MEETINGS ATTENDED BY FACULTYAder, Olin B.

Holiday Mathematics Symposium (national).
Southwest Conference on Improvement of University Instruction (regional).

Arnold, David M.

Holiday Mathematics Symposium (national).
Utah Ring Theory Conference (national).

Bagby, Richard

Holiday Mathematics Symposium (national).
Southwest Conference on Improvement of University Instruction (regional).

Berg, Gordon O.

Holiday Mathematics Symposium (national).
Colloquium Series in Geometrical Topology (national).

Boes, Eldon C.

Holiday Mathematics Symposium (national).
Southwest Conference on Improvement of University Instruction (regional).
New Mexico Education Association (regional).
49th Annual Meeting, National Council of Teachers of Mathematics (national).
Southwestern Section, Mathematical Association of America (regional).

DePree, John D.

Differential Equations Symposium (national).
Board of Governors' Meeting, Pacific Journal of Mathematics (national).

Gaughan, Edward D.

Holiday Mathematics Symposium (national).
National Council of Teachers of Mathematics (national).

Head, Thomas

Holiday Mathematics Symposium (national).
Second Florida Symposium on Automata and Semigroups (national).

Johnson, Donald G.

49th Annual Meeting, National Council of Teachers of Mathematics
(national); Albuquerque Council of Teachers of Mathematics (regional).
New Mexico Education Association (regional).
75th Summer Meeting, American Mathematical Society (national).

Julian, William

American Astronomical Society (national).

Kist, Joseph E.

77th Annual Meeting, American Mathematical Society (national).

Knoebel, R. Arthur

Holiday Mathematics Symposium (national).

Kobayashi, Edward T.

New Brunswick Conference (national).

Krueger, Warren

Holiday Mathematics Symposium (national).

Liebert, Wolfgang

Holiday Mathematics Symposium (national).
New Mexico Council of Teachers of Mathematics (regional).

Mandelker, Mark

Holiday Mathematics Symposium (national).

Maserick, Peter

77th Annual Meeting, American Mathematical Society (national).

McKean, Harlley E.

Southwest Conference on Improvement of University Instruction (regional).
American Statistical Association (national).
Fourth Annual Symposium of Interface: Computer Science & Statistics
(national).
A.S.A. and Brom. Soc. Annual Meeting (national).

Mines, Ray

Holiday Mathematics Symposium (national).

Randolph, Paul H.

Annual Meeting, Operations Research Society of America (national).

Rogers, Gerald S.

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

Shirali, Satish

Holiday Mathematics Symposium (national).

Werth, John

Utah Ring Theory Conference (national).

Williams, Francis D.

Holiday Mathematics Symposium (national).

Walker, Elbert A.

Holiday Mathematics Symposium (national).

75th Summer Meeting and 77th Annual Meeting, American Mathematical Society (national).

University of Houston Meeting on Function Theory (national).

Walker, Carol

Holiday Mathematics Symposium (national).

77th Annual Meeting, American Mathematical Society (national).

University of Houston Meeting on Function Theory (national).

Wisner, Robert J.

Holiday Mathematics Symposium (national).

National Council of Teachers of Mathematics (national).

American Association for the Advancement of Science (national).

Mathematics Conference for Teachers and Administrators (regional).

Annual State Mathematics Conference (regional).

Southwest Section, Mathematical Association of America (regional).

Young, Dennis

Holiday Mathematics Symposium (national).

Western Regional, Institute of Mathematics Statistics (regional).

Southwest Conference on Improvement of University Instruction (regional).

Zund, Joseph D.

Holiday Mathematics Symposium (national).

G. RESEARCH PAPERS PUBLISHED BY FACULTY

Arnold, David M., "A Duality for Torsion Free Modules of Finite Rank Over a Discrete Valuation Ring," Proceedings of London Math. Society (March 1971).

Arnold, David M., "A Duality for Quotient Divisible Abelian Groups," Pacific Journal of Mathematics (April 1971).

Bagby, Richard, "A Difference Quotient Norm for Spaces of Quasi-Homogeneous Bessel Potentials," Studia Mathematica (June 1971).

Gaughan, Edward D., Intermediate Algebra, Brooks/Cole Publishing Co. (1970).

Gaughan, Edward D., Instructor's Manual for Intermediate Algebra, Brooks/Cole Publishing Co., (1970).

- Gaughan, Edward D., Instructor's Manual for Introduction to Analysis, Brooks/Cole Publishing Co., (1970).
- Kist, Joseph, "A Class of Topological Semigroups," Math. Ann. 188 (1970), 206-213 (with Sanford Leestma).
- Knoebel, R. Arthur, "Primal Extensions of Universal Algebras," Math. Zeitschrift (July 1970).
- Knoebel, R. Arthur, "Simplicity vis-a-vis Functional Completeness," Math. Ann. (December 1970).
- Knoebel, R. Arthur, "Criteria for Primality-in-the-small," Notices AMS (October 1970).
- Knoebel, R. Arthur, "Criteria for Primality ... ($k = 1, 2$)," Notices AMS (January 1971).
- Randolph, Paul, "A Model for Allocating Interceptors from Overlapping Batteries: A Method of Nonlinear Programming," Operations Research 19:182-193 (1971) (with G. Swinson, B. Dunn, M. Walker, and B. Williams).
- Richman, Fred, Number Theory: An Introduction to Algebra, Brooks/Cole Publishing Company (May 1971).
- Richman, Fred, "Extensions of p -bounded groups," Archiv der Math. (December 1970).
- Swartz, Charles, "Laplace Transformable Distributions," Port. Math. (August 1970).
- Swartz, Charles, "Nuclearity of Certain $K(M_p)$ Spaces," Math. Nach. (October 1970).
- Williams, Francis D., "Higher Homotopy Commutativity and Extension of Maps," Proceedings AMS (December 1970) 35 pp. 664-670.
- Williams, Francis D., "A Theorem About Homotopy Commutativity," Michigan Math Journal 18 (1971).
- Wisner, Robert J., "Mathematics," Chapter 4, Section 9, The Teacher's Handbook, Ed. by Dwight W. Allen and Eli Seifman, Scott-Foresman Pub. Co., 382-389 (April 1971).
- Walker, Elbert A., "Ulm Invariants," Proceedings of the Rice University Algebra Colloquia (1970).
- Walker, Elbert A., "Abelian Groups That are Injective Over Their Endomorphism Ring," Proceedings of Utah Ring Theory Symposium (March 1971) (with F. Richman).
- Young, Dennis L., "On the Exact Distribution of Hotelling's Generalized T^2 ," Journal of Multivariate Analysis, Vol. 1 (1971) pp. 90-107 (with K \bar{O} C. S. Pillai).
- Zund, Joseph D., "A Spinor Approach to Some Problems in Lorentzian Geometry," Tensor N.S. 21 (1970) pp. 70-74 (with W. F. Maher, Jr.).
- Zund, Joseph D., "The Euler-Poincare and Pontrjagin Characteristic Classes of Pseudo-Riemannian Manifolds," Tensor N. S. 21 (1970) pp. 250-254 (with Jack Levine).
- Zund, Joseph D., "A Note on the Bel-Robinson Spinor," Tensor N. S. 21 (1970) pp. 354-358.
- Zund, Joseph D., "The Euler-Poincare Characteristic and Pontrjagin Number of Einstein-Lorentzian Manifolds," Acc. Naz. dei Lincei, Cl. Sci. Fis. Mat. e Nat. Roma 69 (1970) pp. 47-51.

H. PAPERS PRESENTED BY FACULTY

- Boes, Eldon C., "Report on High School Visitation Program," Southwestern Section, Mathematical Association of America (regional).
- Boes, Eldon C., "Secondary Mathematics Teachers," Trans-Pecos Education Association (regional).
- Smith, Clarence, "Partner Learning," Southwestern Section, Mathematical Association of America (regional).
- Swartz, Charles, "Convolution in Certain Spaces of Generalized Functions," 75th Summer Meeting, American Mathematical Society (national).
- Walker, Carol, "Relative Homological Algebra and Abelian Groups," Rice University Algebra Colloquium (national).
- Wisner, Robert J., "Remarks on the Teaching of High School Mathematics," Michigan State University (regional).
- Wisner, Robert J., "Counting Without Counting," National Council of Teachers of Mathematics (Boulder, national; Southern Section, California Mathematics Council, regional; National Council of Teachers of Mathematics, Anaheim, national).
- Wisner, Robert J., "Contradictions in Public Education," Alpha Delta Kappa (San Antonio, regional).
- Wisner, Robert J., "The Capricious Primes," National Council of Teachers of Mathematics (Montreal, national; Houston Council of Teachers of Mathematics, regional).
- Wisner, Robert J., "Games in Mathematics," Spring Branch Council of Teachers of Mathematics (regional).
- Wisner, Robert J., "Changing Base and Stealing Third," National Council of Teachers of Mathematics (national).
- Wisner, Robert J., "Primes and Decimals," University of Texas at El Paso (regional).

I. PUBLICATIONS OF ALUMNI

- Cutler, D. O., "A Generalization of Final Rank of Primary Abelian Groups," Can. J. Math. Vol. XXII, No. 16 (1970), 1118-1122 (with Paul F. Dubois).
- Cutler, D. O., "Completions of Topological Abelian p-groups," Acta Mathematica, Budapest, Vol. XXII (1971).
- Cutler, D. O., "On the Structure of Primary Abelian Groups of Countable Ulm Type," Transactions of the American Math. Soc., Vol. 152 (December 1970), 503-518.
- Lacey, Elton, "A Note Concerning $A^* = L_1(u)$," Proc. Amer. Math. Soc. (1971).
- Lacey, Elton, "On the Existence of Banach Spaces Whose Duals are Abstract L Spaces," Pacific J. Math. (May 1971) (with J. L. Bednar).
- Lacey, Elton, "Separable Quotients of Banach Spaces," Brazil Academy of Science (April 1971).
- Lacey, Elton, "On Certain Classes of Banach Spaces Whose Duals are Abstract L-spaces," J. Functional Analysis (May 1971).

Mitchell, Roger W. and Mitchell, Richard A., An Introduction to Abstract Algebra, Brooks/Cole Publishing Company (August 1970).
 Porter, Jack, "Not All Semiregular Urysohn-closed Spaces are Katetov-Urysohn," Proc. Amer. Math. Soc. 25 (1970), 518-520.
 Porter, Jack, "Minimal First Countable Spaces," Bull. Aust. Math. Soc. 3 (1970), 55-64.
 Porter, Jack, "A Survey of Minimal Topological Spaces, General Topology and Its Relations to Modern Analysis and Algebra," II, Proc. Kanpur Top. Conf. 1968, Academic Press 1970, 93-114.
 Sember, John J., "Variational FK Spaces and Two-norm Convergence," Math. Z. 119 (1971) 153-159.

J. PROPOSALS AND GRANTS

Proposals Pending

- DePree, John D. (1)
- Liebert, Wolfgang (1)
- Rogers, Gerald S (1)
- Walker, Elbert A. and Walker, Carol (1)
- Walker, Elbert A; Walker, Carol; Richman, Fred; Liebert, Wolfgang; and Mines, Ray (1)
- Wisner, Robert J. (2)

Grants

DePree, John D.	\$ 12,600
Julian, William	575
Loustaunau, Joaquin	80,000
Mandelker, Mark	10,818
McKean, Harlley E.	108,000
Walker, Elbert A. (and others)	39,000
Williams, Francis D.	14,600
Wisner, Robert J.	4,011

K. CRITICAL ANALYSIS

This past year has begun an era of "consolidation of gains" which were achieved during the period of support from the National Science Foundation under a departmental development grant--gains accomplished through the very hard work of the departmental staff and previous chairmen. The necessary leveling off period had to come sometime, and while the consolidation efforts will continue, there will and can be no less emphasis on individual and collective growth toward excellence. It should be noted that while there has been a major downward trend in national support for mathematics, this department has fared quite well and can be expected to continue in this vein for the foreseeable future. We must and will continue to strengthen our interest in and emphasis on service, both internal to the university's needs and external to the

State of New Mexico, while not relaxing the demand for creative activity in research. Departmental funds remain for this department, as with every other department on the campus, woefully inadequate to meet the reasonable needs and demands required for first-rate participation in teaching, research, and professional and public service.