Christopher Hunter, Massachusetts Institute of Technology: "The Rota-
tion and Angular Momentum of Galaxies."
Ethan Bolker, Bryn Mawr College: "Six Problems in Search of a Solution."
Alar Toomre, Massachusetts Institute of Technology: "Polar Wandering
of the Earth."

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

Constructive Analysis	Functional Analysis
Diophantine Equations	Homological Algebra
Computer Science	Point-Set Topology
Topics in Analysis	Ring Theory
Lie Algebras	Abelian Groups
Applied Mathematics	Algebraic Topology
K-Theory	Lie Theory

The seventh annual Holiday Symposium in Mathematics was held during the
period December 27-31. The featured lecturer was Professor George
Whitehead from the Massachusetts Institute of Technology. A total of
67 mathematicians registered for the symposium, some traveling from as
far away as York University in Toronto, Canada.

C. UNDERGRADUATE SCHOLARSHIPS

Physical Science Laboratory 5
Department funds 15

D. IMPROVEMENTS

As in past years, we have maintained a close vigil on our service courses
to make sure that they continue to meet the needs of the students.

We have formed a committee with members from the College of Engineering
to coordinate our service courses related to their fields.

Dr. McKean has been experimenting this past year with the concept of
self-paced learning in the sequence of courses for the behavioral sciences.

Dr. Wisner and Dr. Adams of the computer science department have cooper-
ated in offering an experimental computer-oriented calculus course using
the materials prepared by CRICISAM (Center for Research in College
Instruction in Science and Mathematics).

E. PROFESSIONAL SERVICE

The staff continues to be quite active in professional service. The
following list is not guaranteed to be complete.

Dr. Randolph is Associate Editor for the Operations Research Journal.

Dr. McKean is Associate Editor for Technometrics.

Drs. Thomas, Kist, DePree, Liebert, Mandelker, and Phillips serve as reviewers for Zentralblatt der Mathematik.

Drs. E. Walker, Swartz, Kist, DePree, Johnson, Kobayashi, Mandelker, Mines, and Phillips review for the Mathematical Reviews.

Drs. C. Walker, Johnson, Mandelker, Kist, and E. Walker serve as referees for professional journals such as Canadian Journal, Pacific Journal, Australian Journal, Transactions of the American Mathematical Society, etc.

Dr. E. Walker continues as a consultant for the Committee on the Under-graduate Program in Mathematics, visiting three colleges this past year in this capacity.

Dr. Wisner continues to contribute his services to many professional organizations, serving on the governing board of CRICISAM, and as an active contributor to NCTM (National Council of Teachers of Mathematics).

Drs. Gaughan and Wisner have participated as invited speakers at NCTM meetings in Albuquerque and San Antonio.

While most of the above are national services, every department of a state university has certain responsibilities of service to the state. In the 1969-70 academic year, the department of mathematical sciences has performed these responsibilities in several ways:

- -Two courses and a series of lectures offered by Professor Robert Wisner to students at Mayfield High school.

- -A series of visits by faculty members to high school classes throughout the state.

- -Honoring an outstanding New Mexico high school mathematics teacher (Carlton Evans) with a 1-year instructorship in the department of mathematical sciences.

- -Instituting a mathematics program of retraining junior high school teachers to alleviate the current shortage of capable and quali- fied high school mathematics teachers.

- -Supporting NMCTM and NCTM and MAA, especially by active participa- tion at meetings of this past year.

In the fall, Dr. Wisner offered a voluntary course in number theory to interested Mayfield High School students. The class met twice weekly at 7:30 a.m. at Mayfield High and carried no credit for the 35 students enrolled. In the spring, Dr. Wisner offered a course in probability and statistics under the same arrangements. In addition he gave about 20 talks to regular math classes at Mayfield High. None of these services were financially supported, although the students did give Dr. Wisner a shirt and a tie!

February through May five mathematics professors visited a total of 24 high schools in the state. In all, approximately 80 classes were visited. The purposes of these visits were to (1) spread an interest in mathematics, (2) meet high school math teachers and learn their problems, (3) inform high school teachers and students about NMSU, and (4) meet and recruit students for NMSU, especially in mathematics.

At each school the visitors spoke to several math classes, usually at the junior or senior level. Approximately 40 minutes were devoted to some topic in mathematics; 5 or 10 minutes were reserved for a discussion of college plans, a description of NMSU programs, etc.

The department supported these visits by paying travel and per diem. The program was coordinated by Dr. Boes.

F. PROFESSIONAL MEETINGS ATTENDED BY FACULTY

Ader, Olin B.
Holiday Mathematics Symposium (national).

Arnold, David
74th and 76th annual meetings of the American Mathematical Society
  (national).
Holiday Mathematics Symposium (national).
Symposium on Representation Theory of Finite Groups, 674th meeting,
  American Mathematical Society (regional).
Southwestern Section, Mathematical Association of America (regional).

Bagby, Richard
76th annual meeting, American Mathematical Society (national).
671st meeting, American Mathematical Society (regional).

Berg, Gordon
76th annual meeting, American Mathematical Society (national).
Holiday Mathematics Symposium (national).
670th meeting, American Mathematical Society (regional).

Boes, Eldon
NCTM (regional).
Holiday Mathematics Symposium (national).

NMEA (regional).
Southwestern Section, Mathematical Association of America (regional).

Borges, Rudolf
124th and 125th meetings, Institute of Mathematical Statistics (regional).
Southwestern Section meeting, Mathematical Association of America
  (regional).

DePree, John D.
Functional Analysis Symposium (national).
Holiday Mathematics Symposium (national).

Evans, Carlton Lee
76th annual meeting, American Mathematical Society (national).
NCTM (regional).

Gaughan, Edward D.
76th annual meeting, American Mathematical Society (national).
NCTM meetings in Minneapolis, Washington, Albuquetque (national, regional).
124th meeting, Institute of Mathematical Statistics (regional).
Holiday Mathematics Symposium (national).

Giever, John B.
Holiday Mathematics Symposium (national).
NCTM (regional).

Johnson, Donald G.
76th annual meeting, American Mathematical Society (national).
673rd meeting, American Mathematical Society (regional).
Holiday Mathematics Symposium (national).

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

Kist, Joseph
76th annual meeting, American Mathematical Society (national).
673rd meeting, American Mathematical Society (regional).

Kobayashi, Edward T.
76th annual meeting, American Mathematical Soceity (national).
Holiday Mathematics Symposium (national).

Krueger, Warren M.
670th meeting, American Mathematical Society (regional).
NCTM (regional).
Holiday Mathematics Symposium (national).
NMEA, (regional).

Kruse, Arthur
76th annual meeting, American Mathematical Society (national).
Southwestern Section, Mathematical Association of America (regional).
Holiday Mathematics Symposium (national).

Liebert, Wolfgang
Algebra meeting, Germany (international).
76th annual meeting, American Mathematical Soceity (national).

Mandelker, Mark
76th annual meeting, American Mathematical Society (national).

McKean, Harlley
Conference on Epidemiology Coronary Heart Disease (national).
Pooling Project Subcommittee, New Orleans (regional).
AERA Post-Session Survey Research in Education (national).
Pooling Project professional meeting (regional).
Southwestern Conference on Improvement of University Teaching (regional).
NCTM (regional).
124th meeting, Institute of Mathematical Statistics (regional).
National Audio Visual Association (national).

Mines, Ray
76th annual meeting, American Mathematical Society (national).
Holiday Mathematics Symposium (national).
Southwestern Section, Mathematical Association of America (regional).

Phillips, Keith
Functional Analysis Symposium (national).

Randolph, Paul H.
37th session, International Statistical Institute, London (international).
36th national meeting, Operations Research Society of America (national).
37th national meeting, Operations Research Society of America (national).

Rogers, Gerald S.
124th meeting, Institute of Mathematical Statistics (regional).
Southwestern Section, Mathematical Association of America (regional).

Swartz, Charles
76th annual meeting, American Mathematical Society (national).
Southwestern Section, Mathematical Association of America (regional).

Taneja, Vidya
76th annual meeting, American Mathematical Society (national).
124th meeting, Institute of Mathematical Statistics (regional).
Institute of Mathematical Statistics (regional).

Thomas, John D.
76th annual meeting, American Mathematical Society (national).
Holiday Mathematics Symposium (national).

Walker, Carol
76th annual meeting, American Mathematical Society (national).
Ring Theory Conference (national).
Holiday Mathematics Symposium (national).

Walker, Elbert A.
76th annual meeting, American Mathematical Society (national).
Ring Theory Conference (national).
Holiday Mathematics Symposium (national).
Southwestern Section, Mathematical Association of America (regional).

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

Williams, Francis D.
Holiday Mathematics Symposium (national).
673rd meeting, American Mathematical Society (regional).

Wisner, Robert J.
76th annual Meeting, American Mathematical Society (national)
NCTM (two national, one regional).
124th meeting, Institute of Mathematical Statistics, (regional).
Committee on School Mathematics, University of Illinois (national).
670th meeting, American Mathematical Society (regional).
NMEA (regional).
Holiday Mathematics Symposium (national).

G. RESEARCH PAPERS PUBLISHED BY FACULTY

Borges, Rudolf, "Eine Approximation der Binomialverteilung durch die Normalverteilung der Ordnung 1/n," Z. Wahrscheinlichkeitstheorie verw. Geb. 14, 189-199 (1970).

Julian, William, "Overstability of Thin Stellar Systems," Astrophysical Journal, 155, 117 (1969).

Julian, William, "Pulsar Electrodynamics," Astrophysical Journal, 157, 869 (1969), (with P. Goldreich).

Kobayashi, Edward T., "On the Subgroups of the Centers of Simply Connected Lie Groups-Classification of Simple Lie Groups in the Large," Osaka J. Math. (1970), (with Morikuni Goto).

Kruse, Arthur, Localization and Iteration of Axiomatic Set Theory, Wayne State University Press, Detroit, Michigan (1969).

Mandelker, Mark, "Relative Annihilators in Lattice," Duke Mathematical Journal (June 1970).

McKean, Harlley E., "Crude, Partial Crude, and Net Probabilities: Another Look," Statistical Laboratory, Technical Report Series No. 14 (April 1970).

McKean, Harlley E., "Bernoulli Incidence in the Case of Competitive Risks in Prospective Studies," Statistical Laboratory, Technical Report Series No. 15 (May 1970).

Randolph, Paul H., "The Discrete Max-Min Problem" <u>Naval Research Logistics Quarterly</u> 16: 309-314 (1969).

Randolph, Paul H., "Stopping Rules for Sequencing Problems with Applications to Missile Range Scheduling," <u>Statistical Laboratory, Technical Report Series No. 11</u> (1969).

Rogers, Gerald S., "On Impact Comparisons (WSMR)," <u>Statistical Laboratory, Technical Report</u> (January 1970).

Rogers, Gerald S. "On Testing Compatability of Wind (WSMR)," <u>Statistical Laboratory, Technical Report</u> (January 1970).

Rogers, Gerald S., "On Ordered Families and MLR," <u>Statistical Laboratory, Technical Report</u> (January 1970).

Thomas, John D., "The Theory of Velocity Distributions Associated with Bounded Quiescent Plasmas," <u>Proc. of the Internat. Conf. on Physics of Quiescent Plasmas</u>, Paris (1969).

Thomas, John D., "Cech Homology and the Completion of a Uniform Space," <u>Notices Amer. Math. Soc.</u> Vol. 17 (1970) (with M. Bahauddin).

Wisner, Robert J., <u>A Panorama of Numbers</u>, Scott-Foresman Book Company, Chicago, Illinois (1969).

H. <u>RESEARCH PAPERS PRESENTED BY FACULTY</u>

Arnold, David M., "Symmetric Bilinear Forms," Southwestern Section, Mathematical Association of America (regional).

Boes, Eldon C., "Mathematics Research in the Classrooms," Southwestern Section, Mathematical Association of America (regional).

Borges, Rudolf, "On the Principle of Inclusion and Exclusion," 125th meeting, Institute of Mathematical Statistics (regional).

Borges, Rudolf, "An Approximation of the Poisson Distribution by the Normal Distribution of the Order 1/m," 124th meeting, Institute of Mathematical Statistics (regional).

Borges, Rudolf, "Valuations and Modiuf Functions," Southwestern Section, Mathematical Association of America (regional).

Liebert, Wolfgang, "Endomorphism Rings of Reduced Torsion-free Modules Over Complete Discrete Valuation Rings," 76th annual meeting, American Mathematical Society (national).

McKean, Harlley E., "Coronary Sudden Death and Total Coronary Death," Pooling Project Professional meeting (regional).

McKean, Harlley E., "A Self-Paced Mathematics and Statistics Service Sequence," Southwest Conference on the Improvement of University Teaching (regional).

McKean, Harlley E., "Some Preliminary Results in the Epidemiology of Coronary Heart Disease," Southwestern Technical Writers Conference (regional).

Randolph, Paul H., "Nonlinear Programming Through Optimal Stopping Rules," 37th Session, International Statistical Institute, London, (international).

Randolph, Paul H. "Optimal Stopping Rules for Sequencing Problems," 36th national meeting, Operations Research Society of America (national).

Rogers, Gerals S., "Some Mathematical Overkill," Southwestern Section,

Mathematical Association of America (regional).

Rogers, Gerals S., "On Ordered Families and Order Statistics," 124th meeting, Institute of Mathematical Statistics (regional).

Taneja, Vidya," Sequential Procedures for a Multivariate Slippage Problem," 124th meeting, Institute of Mathematical Statistics (regional).

Walker, Elbert A., "Morita Invariance," "The Gabriel-Popesco Theorem," "Quasi-Frobenius Rings," Ring Theory Conference (national).

Walker, Elbert A., "Divisible Quotients of Reduced Groups," Southwestern Section, Mathematical Association of America (regional).

Werth, John, "x^2 = x for Every x $\in$ R implies R is Commutative, and Generalizations," Southwestern Section, Mathematical Association of America (regional).

Williams, Francis D., "Two Notices of Whitehead Produce Degree of a Space are Equivalent," 673rd meeting, American Mathematical Society (regional).

I. PUBLICATIONS OF FORMER GRADUATE STUDENTS

Bahauddin, Mohammed, "The Homology of Uniform Spaces," Transactions of the American Mathematical Society, to appear (with J. Thomas).

Ensey, Ronald J., "Isomorphism Invariants for Abelian Groups Modulo Bounded Groups," Pacific Journal of Mathematics, Volume 24, No. 1.

Ensey, Ronald J., "Primary Abelian Groups Modulo Finite Groups," Pacific Journal of Mathematics, Volume 29, No. 1.

Howard, Ed, "A Note on Second Category Topological Groups," American Mathematical Monthly.

Lacey, H. Elton, "On Injective Envelopes of Banach Spaces," Journal of Functional Analysis, August 1969, pp. 11-30.

Mader, Adolf, "The Group of Extensions of a Torsion Group by a Torsion Free Group," Arch. d. Math. 20 (1969) 126-131.

Mader, Adolf, "The Fully Invariant Subgroups of Algebraically Compact Groups," Publ. Math. Debrecen (to appear).

Mitchell, A. R., An Introduction to Modern Algebra, Brooks/Cole Publishing Company, Belmont, California (1970) (with R. W. Mitchell).

Porter, Jack, "Fixed Point Theorems for Condensing Multifunctions," Proc. Amer. Math. Soc. 23 (1969), 635-641 (with C. J. Himmelberg and F. S. Van Vleck).

Porter, Jack, "On Locally H-closed Spaces," Proc. Lond. Math. Soc., (3), 20 (1970), 193-204.

Sember, John J., "The Associative Part of a Convergence Domain is Invariant," Can. Math. Bull. 13, (1), (1970).

Sember, John J., "Summability Matrices as Compact-like Operators," J. London Math. Soc. (2), 2, (1970).

Walden, W. E., "A Control Program for Computer Assisted Instruction on a General Purpose Computer," Proc. of the ACM, National Conference and Exposition (1969).

Walden, W. E., "An Instruction System for Computer Assisted Instruction on a General Purpose Computer," Educational Technology, (April 1970).

Whitley, Robert, "Some P_λ Banach Spaces," to appear in the Proceedings of the Conference on Projections.

Whitley, Robert, "Local and Global Subordination Theorems for Vector-
Valued Analytic Functions, _Trans. of the AMS_, 114 (1969) (with
M. Finkelstein).

Whitley, Robert, "A Characterization of Regular Maximal Ideals," _Pacific
J. of Math._ 29 (1969) 277-281 (with C. R. Warner).

J. GRANTS IN FORCE DURING REPORTING PERIOD

H. S. Bear	$ 33,100
J. D. DePree	12,600
L. Solomon	29,700
J. D. Thomas	43,290
Francis D. Williams	10,600
Robert J. Wisner	7,500
E. A. Walker	35,900

Grants Pending

D. G. Johnson	$ 52,480
Harlley E. McKean	38,064
Edward T. Kobayashi	21,395
Robert J. Wisner	7,338

K. CRITICAL ANALYSIS

In contrast with last year, the department has not experienced any serious
staff losses. Appointments include Dr. Joseph Zund from Virginia Poly-
technic Institute, an accomplished and active researcher, and Dr. Dennis
Young from Purdue University, a young statistician. Mr. Clarence Smith
of Gadsden High School has been appointed as Visiting Assistant Professor
to work with prospective teachers, both elementary and secondary. Dr.
Borges, who has been a Visiting Associate Professor this past year, has
been asked to stay another year and he will accept that position if he
can extend his leave of absence from Justus Liebig University.

The new appointments made this past year, Drs. Julian and Mandelker,
have proved to be valuable additions; in fact, both are being promoted
this fall.

Effective July 1 Dr. Robert Wisner will become the new head of the
department. The department looks forward to his leadership to add new
vigor to mathematics at NMSU.

The Holiday Symposium, one of the first sponsored by the Conference Board
of the Mathematical Sciences, was a great success in spite of the diffi-
culties in making the physical arrangements. Another such symposium has
been proposed for next December with Professor Samuel Eilenberg of
Columbia University as the featured speaker. It is sincerely hoped that
it will be possible to continue to hold the meetings on campus.

This past year a very promising young man, Dr. Ernest Shult, was interviewed, but he went to the University of Florida at a salary of $22,000. Competition such as that is difficult to meet, but efforts should continue to reach competitive salary levels. It should be noted that Dr. Shult received his Ph.D. in 1964.

One of the more puzzling moves this past year was the creation of a new department of experimental statistics. In theory, an agreement has been reached on a division of courses and responsibilities so that duplication of effort is reduced to a minimum. The paradox that should be noted is the question of competition for staff. Because of the attempts to avoid duplication of effort, it does not seem that the two departments, mathematical sciences and experimental statistics, should both be attempting to recruit the same man. On the other hand, one wonders about the quality of statisticians with no interest at all in the mathematical underpinning of statistics. An obvious solution is joint appointments, but that was attempted several years ago. Dr. Finkner was offered a joint appointment in mathematical sciences, but he refused it. In addition, it has been discouraging to some of the struggling departments who desperately need new staff to see a new department created and immediately given a new faculty position.

There has been some concern about the creation of new departments. Hopefully, some procedures can be developed whereby interested and concerned parties can have a chance to speak before such decisions are made in the future.

The coming year will be a critical one in terms of finances. Since 1966, a significant portion of the departmental budget has been NSF funds. In essence, the NSF has subsidized the normal growth of the department, allowing the university to allot the released funds to other departments. As the grant runs out, the university must prepare to meet its obligations to the department as promised to the Foundation.

In conclusion, it is fitting to pay tribute to Dr. Roger Corbett, our retiring president. The growth and development of this department and the university during his tenure is a matter of record and attests to his contribution to higher education in New Mexico. May the next 15 years be as productive for New Mexico State University.