THE RISKS OF EXCELLENCE:
THE ROLE OF RESEARCH AT MONTANA STATE UNIVERSITY

by

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PREFACE

The author became interested in the subject of this paper while employed at Montana State University in the Office of Publications and News Services. He served an internship, required of MPA students, in the Office of the Vice President for Research and helped to prepare the 1980 annual report on research activities. Most of the primary information in the paper was compiled during this period. Completion of the paper has been delayed by a career change, relocation to Colorado and family responsibilities. Therefore, it is possible that some elements of the research climate addressed in this paper may no longer exist at MSU. Nonetheless, the paper meets the requirements of demonstrating familiarity with a method of policy assessment as outlined in the professional paper guidelines.

The paper contains many generic prescriptions for developing a balanced research program at MSU. The following should be noted, however.

First, the author does not speak as a representative of the administration or any other part of the university and the paper should not be regarded as an internal planning or assessment document.

Second, the presence of recommendations is not meant to imply that the administration is unaware of problems nor that it has failed to address problems. These recommendations should be regarded as ongoing guidelines for balancing research with other commitments at MSU. The paper is meant to provoke thought and discussion among those parties responsible for ensuring that research is an integral part of university life. It is a timely reminder that the initial phase of the Montanans On a New Trac for Science (MONTS) program is nearing completion and a systematic review of its impact needs to be addressed, raising many of the questions posed in this paper.

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ABSTRACT

Many of the nation's colleges and universities are confronted with the problems of declining enrollment and dwindling resources, leaving these institutions with some hard choices to make about their individual futures. Changing conditions will undoubtedly force some institutions to close their doors, while others struggle to maintain their current levels of operations or selectively cut back programs. Still other institutions are expected to grow by restructuring their services and developing potential areas of growth in curriculum and research.

The challenge facing many institutions, including Montana State University, is how to prepare for a future for which there are no easy answers. The path to survival will vary among institutions, with MSU among those universities attempting to surmount steady-state conditions in part by expanding their research programs. MSU has established an ambitious set of research goals, but administrators must reckon with such factors and constraints as enrollment, economic climate, the legislature, faculty talent, and the need for more facilities and equipment.

A significantly expanded research program - if realized - could boost revenue, enhance institutional prestige and contribute to the benefit of society, but at a possible cost to the university's land-grant mission, ethics, programs, and faculty morale. MSU administrators, who operate under a hierarchical style of management, must continue to fully weigh the potential risks of emphasizing research in the hope of securing additional funds and building institutional prestige. By means of a literature search and analysis, this paper is intended to help alert university administrators and others to potential problems and obstacles in pursuing the current course.

It is the conclusion of this paper that MSU's move to enhance its research program is risky given the constraints on growth. If the university is set on this course, however, administrators should direct their efforts toward establishing areas of excellence through selective retrenchment and substitution. This should be undertaken with a continuing appreciation for and understanding of the land-grant mission of teaching, public service and research.

Chapter 1

INTRODUCTION

That these are not the best of times for colleges and universities is reflected by the number of institutions struggling to cope with the problems of a declining student population, declining financial resources and declining faculty morale. The promise of unending growth has been dashed by various realities, but none so striking as the realization that higher education has arrived at a critical juncture in its history and must begin responding to changing conditions with new strategies for survival. This paper explores these strategies as applied to the conduct of research at Montana State University, an institution whose style of prefectoral or hierarchical management helps explain its research productivity and the recent move to bolster the research program.

One can post a dichotomy between the hierarchical pattern of Montana State University and the collegial pattern of management at its sister University of Montana, as well as other models of governance at other institutions, to suggest that the type of model affects the mission of the university. This may be seen at Montana State University, where a strong, central administration is encouraging faculty members and administrators to acquire research grants and contracts to help secure additional funds during a period of uncertain resources in higher education. The potential ramifications of this emphasis on research at

MSU, which faces severe constraints in terms of competing for monies and becoming a center of research activity, will be discussed at length in this paper.

In many respects, the wonder is not so much that institutions of higher education are confronted with economic and enrollment problems, but that they failed to see them coming. Or, if they did, that they chose to believe that their institutions were impervious to them. Even a cursory examination of conditions and trends would have suggested that their faith in unabated growth was misplaced or, at best, required some tempering. Demographic studies clearly showed that the products of the post-World War II "baby boom" would pass through the school systems by the early 1980s, leaving colleges and universities with a smaller pool of the traditional college-bound group from which to draw. The decline in state, federal and private financial support was perhaps more difficult to foresee, but reason should have suggested that the golden era of the 1960s could not be sustained. Finally, it should surprise nobody that faculty morale would drop at institutions where sagging enrollments and financial resources have led to program cut-backs and the firing of professors.

To a large extent, the nation's 3,000 colleges and universities are caught in a dilemma of their own making. It is a dilemma stemming from the simple, unwavering belief that growth is good and the only real measure of success. Until recently, institutions had little reason to question that belief as they enjoyed the fruits of a steadily expanding economy and student enrollment. An expanding pie was divided among all participants within the university organization, a

practice which enabled administrations to keep most interest groups and clients satisfied or at least placated. Today's austere environment, however, is forcing a radical rethinking of that style of management and approach.

Colleges and universities have discovered to their dismay that the limits to growth may have been reached, but their exponential expectations remain. The 1960s, a decade when spiraling enrollments fueled an unprecedented building boom on campuses, has long since passed, leaving most institutions with some hard choices to make about their individual futures. Growing financial constraints and slipping enrollments have raised the issue of survival for some institutions and prompted others to re-examine their goals and priorities and the ways in which they are managed and financed.

Planning for decline has emerged as a major consideration among many colleges and universities in this new era of limits. In a sign of the times, the three "R's" are depicted by some observers as representing reduction, reallocation and retrenchment.[1] Indicative of this trend, a great deal is being written of late on planning and retrenchment, with various authors urging institutions to take stock of their positions and, perhaps, to revise their roles and missions.

While planning for decline is appropriate for some institutions, it may unnecessarily limit planning to questions about how to manage cutbacks and retrenchment. Other strategies, including expansion of selected programs, may warrant careful, studied consideration by at least some institutions, including Montana State University.

At Montana State University, a land-grant institution where enrollment continues to climb, the administration is preparing for modest but continued growth. MSU's position is not unique, but it is an enviable one at a time when some institutions are struggling for survival and others are striving to maintain stability. Among the broad areas targeted for growth at MSU is research, an emphasis that in part represents an attempt to find more resources. While it offers some promising possibilities, such a plan is fraught with dangers and questions more easily raised than answered. These questions embrace such key issues as ethics, university excellence and the level of responsibility to the state. They begin with: What kind of research program is consistent with the aims, responsibilities and potential capabilities of Montana State University?

Given MSU's apparent intention to strengthen its research program, a basis exists for exploring the problems and challenges facing the administration in rationally planning such a significant expansion in an uncertain environment. It is the basic thesis of this paper that an emphasis on research has significant implications for MSU. To understand these implications will provide us with an insight into the university as an organization and its characteristics, and it will help to alert the university to potential problems and obstacles in taking this path.

Specifically, the paper is arranged as follows: Chapter 1, an overview, begins with a look at the land-grant mission and briefly traces its history. The chapter also examines MSU's role as a land-grant institution and its evolving research programs. The expansion of

these programs raises philosophical questions about growth and service to the public. These questions and why universities undertake to conduct research are examined in Chapter 2. The problems of acquiring funding also are explored in this chapter, which suggests that there is little reason for most institutions to be unduly optimistic about gaining a larger share of federal support. Chapter 2 also takes a close look at the new relationship between university and industry in the area of research. While these burgeoning relationships are viewed as being of mutual benefit, questions are being raised about their effect on traditional academic values, institutional autonomy and the potential for abuse. These concerns are examined along with the apparent willingness of many universities to comply with industry guidelines that they would never adhere to if set down by the government.

The focus of Chapter 3 is on how the problems that administrators face in managing institutions are heightened by the nature of the university organization. The university organization differs from virtually every other organization, including those in the public sector. Four models of university organization are detailed in this chapter, with emphasis on MSU's hierarchical structure and the influence of this model on decision-making.

The problems that enrollment-driven institutions like MSU face in maintaining funding and planning ahead are outlined in Chapter 4. Also examined are the major constraints that MSU must grapple with in trying to build its research program. The growing popularity of strategic studies among universities attempting to plan ahead is also presented.

The importance of addressing questions of growth and quality in a university's programs are stressed in the conclusion to this paper. The strength and success of MSU's land-grant mission is reviewed as well as the need to adapt to changing times. The institution is cautioned that to base an overall survival strategy on an expanded research program is risky.

FOOTNOTES

[1] Kenneth P. Mortimer and Michael L. Tierney, The Three "R's" of the Eighties: Reduction, Reallocation and Retrenchment (Washington, D.C.: American Association for Higher Education-Clearinghouse on Higher Education Research Report No. 4, 1979), p. 1.

Chapter 2

MONTANA STATE UNIVERSITY AND THE LAND-GRANT MISSION

Introduction

Research and the land-grant university are virtually synonymous in America and for good reason. As will be discussed in this chapter, research is one of the major functions of land-grant schools and the schools have repeatedly proven their ability to search for new knowledge and disseminate that knowledge. Montana State University has built a commendable record in acquiring research dollars in recent years, but the renewed emphasis on research at MSU raises difficult questions about the impact on the institution's traditional goals of serving the student and state.

Historic Perspective

Because an understanding of the land-grant institution is central to any discussion of MSU and its future, it is useful to begin with a look at the land-grant mission and briefly trace its history. The 72 land-grant institutions in the 50 states and three territories represent a unique system of American higher education and owe their creation to the Morrill Act. The Act, which was passed in 1862 in the midst of the Civil War and over the opposition of some Western congressmen, was intended to help the states meet immediate and practical problems, especially in the area of agriculture.[1]

Reflecting on more than a century of progress among land-grant institutions, David Madsen observes:

> In a sense, the aims of the Morrill Act were clear enough. Colleges were to be created "where the leading object shall be . . . to teach such branches of learning as are related to agriculture and the mechanic arts . . . in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life.[2]

Another major contributing factor in the development of land-grant colleges was passage of the Hatch Act in 1887, which provided for the creation of experimental stations to perform agricultural research and service. Notes Madsen:

> The later success of the colleges was due in part, at least, to the activities engendered by the experiment stations with their well-equipped barns, their carefully nurtured fields, their laboratories and demonstration facilities, and to the services they provided through correspondence with persons seeking answers to questions having to do with agriculture.[3]

Clark Kerr, former president of the University of California, terms creation of the land-grant movement "one of the most seminal pieces of legislation ever enacted."[4] He credits the movement along with federal support for scientific research as having had the greatest impact in molding the modern American university system.[5] The land-grant movement opened the doors of higher education to all qualified comers in a democratization that now characterizes the college and university in America. The land-grant movement also championed the concept of applied research conducted to benefit not only the agricultural community, but all citizens. The movement also has been instrumental in fostering basic research, whose payoffs often are years or decades in the future. The practical nature of land-grant schools has tended to

reinforce the applied side of research, a position supported by many state officials and taxpayers who seek the biggest return on the dollar.

Responding to local and national needs and demands, the land-grant system has evolved over the years and today fulfills a significant role in the nation through its three-fold function of teaching, research and public service. With a focus on these three concepts, the most prestigious land-grant universities have taken their place among the nation's elite institutions of higher education. Leading land-grant universities include the University of California at Berkeley, Wisconsin, Cornell, Michigan State, Illinois, Minnesota, Purdue, Pennsylvania State, and Massachusetts Institute of Technology.

Montana State University: An Overview

Montana State University, with a 1983 fall enrollment of 11,447 and a solid research program, is a middle-tier institution with marked aspirations. Established as an agricultural college in Bozeman by legislative action in 1893, the university today offers programs in the liberal arts, the professional areas, agriculture, engineering, and the basic sciences. Instruction leading to bachelor's degrees is offered in 42 fields, with graduate instruction in 38 fields and 16 fields at the doctoral level.

Although research is among the least understood missions of the land-grant institution, it is a distinctive element that has expanded greatly since World War II. Montana State University's commitment to research begins with the recognition that, as a land-grant institution, it

has certain responsibilities in the area of agriculture as well as in striving to meet the changing economic and social needs of the state and nation.

The 1974 report of the Montana Commission on Postsecondary Education details five specific missions for MSU. It recommends that MSU:

(1) "Should offer a broad range of undergraduate programs in the liberal arts and sciences, teacher training, agriculture, engineering and selective professional areas, as well as the associate degree.[6]

(2) "Should provide graduate instruction, research and public service.[7]

(3) "Should share with the University of Montana exclusive authority in public higher education to award the doctorate. However, doctoral programs should be offered in a limited number of carefully selected disciplines except for such specialized programs which may be retained at Montana College of Mineral Science and Technology.[8]

(4) "Should provide four-year and graduate programs in engineering and have exclusive jurisdiction over the Ph.D.[9]

(5) "Ph.D. and Master's programs should emphasize the special character of the land-grant university and the special needs of the state and region."[10]

The commission further recommended that the primary mission of each of Montana's six units of higher education be the education of undergraduate students.[11] It also recommended that the University of Montana and Montana State University "carry on with their heavy research emphasis and offer advanced graduate and professional degrees."[12]

By supporting six units of higher education and allowing both MSU and the University of Montana to "carry on with their heavy research emphasis,"[13] the commission reinforced the built-in conflict over scarce resources. The possibility of a center of excellence emerging at any of the institutions is reduced by the simple reality that a limited number of resources must be spread among six institutions, the smallest of which have had problems sustaining enrollment. Further, it becomes difficult for any one discipline or institution to flourish without doing so at the expense of others. The danger is that while all six units may survive, they do so at a less than desirable level in terms of enrollment, academic excellence and fiscal soundness.

Research Mission

Despite various obstacles in its path, Montana State University has become increasingly active in the area of research. The university's Agricultural Experiment Station boasts the main station on the Bozemen campus, three research farms and seven research centers spread across the state. The station's areas of research include crops, crop diseases, soils, livestock, livestock diseases, economics, range reclamation, insects, environment, wildlife, and people.[14] The university also operates such traditional land-grant programs as the Cooperative Extension Service and the Engineering Experiment Station, which utilizes the talents of the engineering faculty on problems requiring research not available from private firms.[15]

Virtually every department within MSU claims to have an interest or stake in performing research. In a recent report on research, Dr.

John W. Jutila, vice president for research, notes that nationally-recognized programs in immunobiology, surface physics, plant pathology, and coal technology have been developed at MSU, with some individual faculty members achieving world class stature.[16]

Although the earliest faculty members at MSU engaged in research at various levels, the first recorded sponsored research at the university began in 1947 with the award of a $13,000 grant from a private company.[17] Sponsored activity grew slowly and not until 1965 did the university generate $1 million in research expenditures.[18] Since then research activity has accelerated with funding from federal, state and private sources.

The last decade, in particular, represented a period of significant growth for MSU in terms of research funding and total sponsored program activity (Table 1). Research funding increased from $1.3 million in 1970 to $6.7 million in 1980, and $7.7 million in 1981. However, this dropped in 1982 to $6.8 million and again in 1983 to $6.75 million.[19] Total sponsored program activity grew from $3 million in 1970 to $9.7 million in 1980. It reached $11.25 million in 1981, but declined in 1982 to $10.12 million and in 1983 to $9.8 million.[20] Significantly, the decline accompanied a drop in federal support of program activity from 75 percent in 1980 to 65 percent in 1983.[21] The drop in research and program funding after years of steady growth is an ominous sign for MSU, which has set its sights high as outlined later in this chapter.

MSU has depended heavily on federal funding for its research, but

Table 1 Growth of research support and total sponsored programs at Montana State University (in millions).

Year	Research Support	Total Sponsored Programs
1970	$1,321	$ 3,056
1971	1,512	3,024
1972	1,712	3,481
1973	2,171	4,097
1974	2,248	3,880
1975	2,516	4,007
1976	4,742	6,204
1977	5,696	7,383
1978	5,539	7,086
1979	5,296	7,663
1980	6,664	9,707
1981	7,748	11,248
1982	6,800	10,120
1983	6,750	9,824

Source: Office of the Vice President for Research, Montana State University.

Jutila and others acknowledge that the outlook for sustaining these high levels of funding is bleak. He observes:

> During this policy and funding hiatus the university must seek to preserve the momentum and quality it has generated over the last decade. Federal sources, of course, will continue to be sought wherever possible, but the state must also be encouraged to accept its responsibility to support a high quality research effort that will, at the same time, complement and support economic development in the state. Funding opportunities will also be sought in the private sector and private fund-raising activities involving friends and alumni of the university will also be key to preserving the core of the research enterprise.[22]

Instrumental in attracting funding are such scientists as Dr. Gary Strobel, a plant pathologist whose research has included experiments to

control Dutch elm disease. MSU joined the Freshwater Biological Research Foundation and the Ortho Consumer Products Division of the Chevron Chemical Company in pursuing an exclusive, worldwide license agreement to develop the Dutch elm disease control product. Other researchers in the Department of Plant Pathology are credited by Jutila with helping to lead an international effort to improve the control of barley diseases.[23]

Researchers with the Agricultural Experiment Station often are cited for their work in developing top-performing crop varieties in Montana, and for developing vaccines for diseases that strike calves and sheep.[24]

Few programs on campus are more active in research than the Department of Physics, which has established a regional laboratory for surface science and submicron analysis with a $1.4 million grant from the National Science Foundation. The department also is active in research programs in relativity and astrophysics, atomic and solid state physics, and laser spectroscopy.[25]

Within the social sciences, faculty members have published books and articles in national publications within such disciplines as English, history, economics, sociology, philosophy, and political science.

Overseeing and extending support to these research efforts is the Office of the Vice President for Research, which was established in 1965. The office, while comparatively small, has grown administratively and includes or deals with the following units: Museum of the Rockies, Grants and Contracts Office, Agricultural Experiment Station, Engineering Experiment Station, Magnetohydrodynamics Research Office, Water

Resources Research Center, Center for Terrestrial and Atmospheric Systems Research, and Office for Research and Development. Other units include the Bureau of Education and Research Field Services, Center for Social Data Analysis, Electron Microscope Laboratory,[26] and the 49th Parallel Institute.

On the Threshold of a Dream

In light of this growth in research at MSU and various scientific and scholarly achievements which have drawn national and international recognition, the administration views the institution as standing on the threshold of becoming a first-class research university in the Rocky Mountain Region.[27] To what extent the university succeeds in realizing this vision will depend on a number of interrelated factors that include enrollment, economic climate, the legislature, facilities, faculty talent, and the acquisition of sophisticated instruments.

Planning and institutional evaluation are essential if Montana State University is intent on building its research program at a time when financial pressures have forced such western institutions as the University of Idaho, Idaho State University, Boise State University, University of Utah, Colorado State University, Washington State University, and the University of Washington to make budget cuts by eliminating staff positions and selected programs. Other institutions are de-emphasizing research in the face of stiff competition for federal dollars and the growing cost of conducting research. Some are delaying the purchase of new laboratory equipment or dropping research in certain fields of study.

While cognizant of funding trends and the pitfalls dotting the landscape, MSU officials were thinking expansion rather than retrenchment in setting out the following five-year research goals for the period 1980-1985:

(1) Grants and contracts income of $18 million by 1985. Total research and development expenditures of $28 million, which it is projected would rank MSU among the top 80 institutions in the United States in terms of expenditures.[28]

(2) Increased research space totalling 200,000 square feet. Proposed or planned facilities include an experimental animal facility, engineering research center, and biomedical/biological research center.[29]

(3) At least 100 new research professionals added to staff.[30]

(4) Nationally-recognized programs in water resources, food technology, reclamation science, surface physics, immunobiology, coal utilization, biofuels technology, and molecular mechanisms of disease.[31]

(5) Establishment of new institutes and centers to support research in transportation, natural resources, food technology, and solar energy.[32]

(6) Establishment of close ties with state agencies and the private sector to promote the use of better data and new technologies.[33]

These goals, which emphasize the natural sciences and engineering, reflect in many respects an evolving interpretation of the land-grant mission. In making a strong commitment to research, the administration has made it clear to faculty members that promotion, in

part, will require at least a modest performance in research.[34] Frequent verbal declarations of this commitment have been made by MSU President William Tietz with the reasoning that research is indeed part of the university's mission and important in helping to frame its image.[35]

Encouraging Research Activity

To encourage research activity, the university has undertaken various strategies to:

(1) Encourage professional or faculty development by offering "seed" grants to young faculty or to those who desire a fresh start in research.[36]

(2) Train selected faculty members in proposal preparation, develop channels for communications with funding agencies, and screen proposals to keep within institutional policies.[37]

(3) Establish a research information system to provide data on current research being performed at MSU and attempt to match faculty members' interests with funding opportunities.[38]

Given the administrative decisions to step-up research, one of the most difficult policy questions is likely to center around how much and what kind of research Montana State University will conduct. In light of current economic conditions, the institution may soon be faced with decisions about which disciplines to emphasize in terms of research and which to neglect for funding. The setting of the five-year goals directs the university toward the areas of natural sciences and engineering, leaving perhaps only the question of which programs and curriculums in these areas will flourish.

An unsparing appraisal of individual motives and institutional needs and responsibilities is necessary if MSU is determined to enhance its research program, possibly at the expense of other programs serving the state and students. It is legitimate to ask whether MSU, in pursuing a greater research role, is following a road that stymied other institutions during the "academic revolution"[39] of the 1960's. Gross and Brambsch note that the decision to emphasize research carries certain costs:

> There are definite and predictable sets of goals which characterize universities of high and low productivity. High productivity means focusing on research and graduate study and placing less emphasis upon traditional goals such as producing well-rounded students, loyalty to the local institution, or satisfying the needs of persons in the local areas.[40]

Concluding Comment

The aforementioned concerns surrounding an emphasis on research need to be regularly addressed by administrators at MSU. In this ongoing review of MSU's missions and priorities, President Tietz, faculty members and others can draw on the rich tradition of the land-grant university in serving the public through such avenues as instruction, research and the extension service. It is true, as G. Lester Anderson asserts, that "land-grant colleges and universities today bear only a modest resemblance to what they were seventy-five or even fifty years ago."[41] What remains unchanged are the concepts and values that comprise these institutions and continue to guide faculty and administrators. As a land-grant university, MSU's mission clearly encompasses teaching, research and public service. Striking a balance

between these missions, however, provides fertile ground for conflict both within and outside the university. Whether a changing university can achieve that balance without tearing the institutional fabric or turning its back on the needs of students and others deserves continued, thoughtful consideration.

FOOTNOTES

[1] Edward Danforth Eddy, Jr., Colleges for Our Land and Time (New York: Harper and Brothers, 1957), p. 35.

[2] David Madsen, "The Land-Grant University: Myth and Reality," Land-Grant Universities and Their Continuing Challenge, G. Lester Anderson, ed. (East Lansing, Mich.: Michigan State University Press, 1976), p. 34.

[3] Ibid, p. 38.

[4] Clark Kerr, The Uses of the University (Cambridge, Mass.: Harvard University Press, 1964), p. 46.

[5] Ibid.

[6] Final Report: Montana Commission on Postsecondary Education, by Ted James, Chairman (Helena, Mont.: Montana Commission on Postsecondary Education, May 1980), p. 58.

[7] Ibid.

[8] Ibid.

[9] Ibid.

[10] Ibid.

[11] Ibid, p. 51.

[12] Ibid, p. 52.

[13] Ibid.

[14] Greg Northcutt, Ag Research: Your Harvest of Dividends (Bozeman, Mont.: Montana Agricultural Experiment Station, 1980), p. 3.

[15] Office of the Vice President for Research, Montana State University, Self-Study Report of Montana State University to the Commission on on Colleges (Bozeman, Mont.: Montana State University, October 1980), p. 250.

[16] Office of the Vice President for Research, Montana State University, Report on Research 1980 (Bozeman, Mont.: Montana State University, 1981), p. 4.

[17] Ibid, p. 6.

[18] Based on a review of growth of total sponsored programs and research support at Montana State University. Data provided by Office of the Vice President for Research.

[19] Ibid.

[20] Ibid.

[21] Ibid.

[22] Office of the Vice President for Research, Montana State University, Report on Research 1981 (Bozeman, Mont.: Montana State University, 1982), p.3.

[23] Report on Research 1980, pp. 16-17.

[24] Report on Research 1981, pp. 9-12.

[25] Report on Research 1980, pp. 35-36.

[26] Self-Study Report, p. 225.

[27] Ibid, p. 224.

[28] John W. Jutila, "An Outline of Research Activities at MSU," a supplement to the 1980 Self-Study Report of Montana State University, Bozeman, Mont. May 1980.

[29] Ibid.

[30] Ibid.

[31] Ibid.

[32] Ibid.

[33] Ibid.

[34] Self-Study Report, p. 256.

[35] Ibid.

[36] Ibid, p. 257.

[37] Ibid.

[38] Ibid.

[39] Christopher Jencks and David Riesman, The Academic Revolution (New York: Doubleday, 1968).

[40] Edward Gross and Paul V. Grambsch, Changes in University Organization: 1964-71, p. 100, quoted in Bruce L.R. Smith and Joseph J. Karlesky, eds., The State of Academic Science: Background Papers (New York: Change Magazine Press, 1978), p. 52.

[41] G. Lester Anderson, ed., Land-Grant Universities and Their Continuing Challenge (East Lansing, Mich.: Michigan State University Press, 1965), p. 1.

Chapter 3

RATIONALE FOR UNDERTAKING RESEARCH AND UNANSWERED QUESTIONS

Introduction

While research is part of the land-grant mission, there are many reasons as to why Montana State University and other institutions of higher education undertake to do research. These reasons, which range from service to others to seeking personal and institutional recognition, are explored in this chapter along with an overview of the benefits and drawbacks of conducting research. The 1983 federal budget for research also will be presented with the argument that most colleges and universities benefit very little from federal expenditures for research and are unlikely to benefit from them in the future. In addition, the developing relationship between university and industry will be reviewed along with potential problems in the two institutions working together.

Reasons for Conducting Research

The university emerged from the 19th century as "the principal home of science"[1] in America and has continued to fulfill its role as an institution where research and development occur. That is not to suggest, however, that the value and direction of scientific work undertaken at universities - both within Montana and across the nation - command unanimous agreement. Support for and belief in the

value of research appears to vary widely among the public, their elected officials and within the educational establishment.

Discussing the university's need for a rationale for its research activities, Dael Wolfle suggests that such a rationale should be "both politically persuasive and intellectually honest."[2] Wolfle clearly recognizes the political realities of research and a partial erosion of the scientific community's credibility in stating its case for funding that never seems to stretch far enough.

Wolfle notes that there are three central reasons for conducting research: "to educate students, to maintain and enhance the scientific capabilities of the faculty, and to undergird the university's role as an informed and objective social critic."[3] That assessment is shared by many educators, as well as others, and is lofty and broad enough to encompass a wide range of activities and interests.

Wolfle's description of the three central functions of research apply to Montana State University. For example, it is generally recognized that students benefit when their professors are on the leading edges of their disciplines. A student who leaves the university with specialized skills and knowledge is of greater value to society and more employable. An apprenticeship, or even exposure to a professor doing research, certainly contributes to the growth of the student.

In the area of faculty competence, it is generally acknowledged that a professor's skills and abilities are maintained and enhanced if there is access to research facilities and a quality library. An outstanding research program can be expected to attract outstanding researchers, which contributes to an improved climate for learning.

Increased emphasis on research should not mean a de-emphasis of teaching, however. A department committed to both teaching and research may be in the position to formulate schedules which allow the researcher to spend extra time on scientific work and the teaching professor to spend more time in the classroom. This model has been adopted to some extent at MSU by the physics department, which boasts some outstanding researchers and teachers. Other departments on campus expect their faculty members to balance the responsibilities of teaching, research and public service.

Nationally, it is evident that many of the elite institutions emphasize the researcher role because they are able to attract dollars for research. At MSU, a middle-tier institution, faculty members fill a mixture of roles in teaching and research. With the increased emphasis on research, MSU faculty members could have reason to be concerned that they will be expected to shoulder their traditional responsibilities of teaching and, to a lesser extent, public service, while assuming greater responsibilities for research. The university has taken steps to lighten the teaching load by awarding grants to selected faculty members to give them additional time to pursue their research or creative projects. The program is scarcely comprehensive, however, nor are all faculty members at MSU or any other institution suited for or particularly interested in carrying out research.

The role of the university as critic is the last leg of the tripod supporting Wolfle's rationale for research.[4] In the fullest sense, this can be expanded to include the search for knowledge through basic research, which lays the foundation for later practical applications.

Because of its political and social ramifications, this is perhaps the hardest role to convince the public that a university should fill. But notes Wolfle:

> Society is ever at the mercy of the demagogue, the charlatan, the slick advertiser, or the unprincipled self-seeker. For its own protection, society needs the antidote of objectivity, the clear-headed analysis of trends and alternatives, and sometimes the unmasking of false claims.[5]

Selling the Value of Research

Robert Oppenheimer, posing the question of why scientists seek new knowledge, concludes that new knowledge is useful and its pursuit ennobling.[6] However, why taxpayers should support a scientist's ennobling experience - particularly if it is difficult to see any returns for society - is precisely the kind of question that can lead to public opposition to increased research. When taxpayers ask what their support of research is worth or has yielded, the response has been to cite such practical returns as hybrid seed corn, polio vaccine and the Pill. Such examples, especially the development of hybrid corn, "have been cited so often that they have lost much of their political influence."[7] Yet, these and other examples continue to be cited by universities and with proud justification.

In attempting to sell the value of research to Montanans, Montana State University has built much of its argument around the theme that research is a good investment, with returns that are better than stocks or savings accounts. A Montana Agricultural Experiment Station pamphlet states that "agricultural research has meant literally millions of extra dollars each year to Montana."[8] It quotes a USDA economist's estimate that each dollar invested in agricultural research can earn as

much as 25 to 50 cents.[9] While farmers and ranchers are the main recipients of this research, the underlying theme clearly is that all Montanans are better off for this research and that a rising sea of prosperity lifts all boats. This dollars-and-cents sales pitch is intellectually repugnant to more than a few MSU researchers, but it is an approach that recognizes the political and practical realities of selling reserach to the general public.

In its 1980 report on research, the Office of the Vice President for Research notes that a research investment of slightly over $1 million on the crops wheat, barley and potato has improved the production of these crops by an estimated $66 million over a ten-year period.[10] Vice President for Research John W. Jutila suggests in the report that:

> The ultimate applications of research are not always immediate or so readily apparent, but the cost-benefit analyses of medical and agricultural research speak to an important public policy issue: that of investing in the research and creative efforts of the universities of this country and the public good that derives from these humane and beneficial endeavors.[11]

Research as a Measure of Prestige

Prestige is another factor in attempts to strengthen or expand research programs at Montana State University and other institutions. Jutila, discussing the rationale for research, notes that, "It has been said that the quality of research conducted by the faculty is the most important factor contributing to the eminence of a University."[12]

That it is extremely difficult to gain that eminence and break into the inner circle of the nation's top research universities is reflected in a study sponsored by the ad hoc Conference Board of Associated Research Councils. The 1983 study revealed that the academic prestige of the nation's top research universities has changed little over the last

ten years. Virtually all of the graduate facilities rated in the top 20 continued to hold that honor, although some positions changed. The study, based on a polling of 5,000 faculty members at 228 colleges and universities, rated the University of California at Berkeley as the strongest across-the-board graduate institution. Other top institutions included Stanford, Harvard and MIT.[13]

A factor in the drive for prestige is the number of administrators and faculty members in colleges and universities who were educated at large research universities. This background is viewed as influencing their research goals and perceptions. Comments John D. Millett:

> Because they have often received their graduate education in leading research universities, many faculty members enter their academic careers enamored of research. Research has been a principal pathway to academic recognition in the past 30 years.[14]

Dr. William Tietz, president of MSU, received his doctorate from Purdue University while Jutila received his doctorate from the University of Washington, both major research universities. Furthermore, various department heads and deans at MSU received their doctorates from such institutions as Stanford, Purdue, Lehigh, Wisconsin, Illinois, Oregon, Oregon State, Ohio State, Texas, and Washington.[15] The linking of one's academic background to research goals may be an unfair characterization in the case of Tietz and Jutila, but the relationship has been commented on by so many observers in higher education that it appears to have some merit.

Financial Sides of Research

Other, more down-to-earth reasons exist for MSU to attempt to maintain and upgrade the conduct of research. Perhaps the most basic

reason from the standpoint of many is financial. Research monies can be used to help MSU improve the fiscal conditions of various departments and programs. Additional federal, state and private funding are viewed as vital if the university is to purchase new equipment in the sciences, and materials and time for faculty members in the humanities and social sciences.

Conversely, an intensified effort to acquire more research dollars can draw down the fiscal resources of departments, whose faculty members and staffs must devote greater amounts of time to preparing grant applications. The many hours that professors once spent preparing for classes or meeting with students is diverted toward trying to attract more money for projects that may hold little interest for anyone, including the researcher. Society may wind up paying for research that yields no real dividends while stealing time from students and from more legitimate research that brings in fewer dollars. If it is not careful, the university can find itself in the vicious circle of conducting research that is dictated solely by the kinds of research dollars available.

The process also can wind up as a zero sum game if recovered indirect costs are diverted to the state treasury or if they prompt lower proportional state funding. In either case, the university may find that it has to generate ever greater amounts of dollars in the hope of keeping just a share. In addition, the university runs the risk of becoming over-reliant on research monies at a time when a growing number of institutions are entering the competition for research funding. These institutions, like MSU, are looking for new sources of

funding and boast some promising and proven researchers. A background paper circulated to the Stanford University Board of Trustees notes that:

> The capacity to do good research is becoming more and more widespread in this country. This is due largely to the fact that graduate programs at the best institutions have been turning out people with doctorates faster than this same class of schools can absorb them as faculty members. The average quality of faculty at a broad spectrum of colleges and universities, both public and private, has been growing significantly in recent years. Principal investigators at relatively unknown institutions are becoming increasingly competitive for sponsored reasearch support.[16]

While increased competitiveness among institutions is a healthy sign of research capability, fewer than 100 colleges and universities out of 3,000 institutions receive the bulk of money for scientific research and development. MSU was ranked 113th in fiscal 1980 (the last year for which figures are available) in terms of R&D expenditures, well out of range of such elite institutions as Stanford, MIT and Harvard.[17]

Federal Funding

In its study, Scholars, Dollars, and Bureaucrats, the Brookings Institution observes that federal research managers seek out those universities that have the academic strength, commitment and facilities to conduct specialized research. More often than not, those universities are the elite research institutions which traditionally snare the lion's portion of grants and contracts.[18] Beyond that, the study notes:

> The R&D enterprise is the one area of federal higher education policy where old-fashioned meritocratic norms are still significant. Where is the ablest scholar or research team in the country that could undertake a particular inquiry? Which among ten applicants shows the greatest promise of making a valuable contribution to human knowledge in a stated field?[19]

The elite research institutions, as well as MSU, depend heavily on the federal government for research support. This support has grown dramatically since World War II, although universities have seen a drop in real increases in federal funding. Still, they have fared generally better than many other areas in recent budgets. Observes Robert M. Rosenzweig:

> A fair reading of the record will show that research and higher education had an unusually long run of governmental favor and that, in fact, they have not really fallen from favor so much as they have suffered from increased competition for it. To be precise, funding from academic research and development grew (in constant 1972 dollars) at an annual rate of 12 percent from 1953 to 1969, 14 percent from 1960 to 1968, zero percent from 1968 to 1974, and 4 percent from 1974 to 1978.
>
> Fifteen years of such high rates of growth is an extraordinary record of abundance, a record that made the drop to zero both shocking and unconscionable. The small real increases of recent years rank academic research and development as among the more favored of the discretionary objects of governmental patronage.[20]

Most observers agree that federal funding for research and development in fiscal 1983 was better than many had hoped. Congress approved an estimated $44.3 billion for research and development spending - about one percent less than the Reagan administration had initially asked for. Willis Shapley of the American Association for the Advancement of Science said the one percent change largely reflected a $1.8 billion cut in funds originally earmarked by the administration for defense programs.[21] Shapley remarked, "Our general assessment is that Congress really treated the (research and development) business and science very well. I don't think the R&D community could have expected anything better out of the budget than they got."[22]

Defense funding for 1983 increased 13 percent from fiscal 1982 and 35 percent from fiscal 1981. While large, that increase represents about 60 percent of what the administration had sought. Proportionately, nondefense programs fared less well, but they were up an average 7 percent. In terms of constant 1972 dollars, however, the nondefense share of the research budget fell more than 10 percent from fiscal 1981 to fiscal 1983.[23]

With the final determination of funding for fiscal year 1983, it is clear that colleges and universities face continued constraints in many areas of federal support. The Reagan administration expects the private sector to assume a greater percentage of support for research and development, and has moved to relax some government regulations and enact favorable tax changes for corporations.

Rosenzweig suggests that universities falsely expected to enjoy favored status from the federal government.[24]

> In the coldest and clearest view of the matter, research universities have no more claim to 'partnership' with the government than do farmers, merchant shippers, highway builders, or any other group that has established a claim on government patronage.[25]

Federal funding will continue to play a major role in the support of research and development. But middle-tier institutions like Montana State University need to guard against pinning too much of their trust in securing federal monies for research. The apparent shift in funding priorities and entry of similarly competitive colleges and universities into the research arena could undercut the efforts of a number of institutions. Rosenzweig and others urge universities to explore new ways to make business a more active participant in research and development.[26]

University-Industry Partnership

In fact, many of the nation's universities are rediscovering business and industry as potential sources of research funding. The developing relationships between university and industry are particularly evident in the areas of bioengineering and microelectronics, where the promise of rich dividends beckon. While such joint ventures are typically viewed as being of mutual benefit, the partnerships are raising questions about traditional academic values, institutional autonomy, the direction of research, and the potential for abuse within the scientific community. Further, university expectations that private funding sources can be substituted for lagging state and federal monies appear to be unrealistic.

Renewing Old Ties

That many universities are turning to industry for new research funding (after years of oversight or even disdain for the private sector) has some historical justification. Up until World War II, the private sector provided much of the money to support research (excluding agriculture) at the university level. That changed dramatically with the outbreak of World War II as the nation poured money into defense research and "produced a dazzling array of new technologies - the atomic bomb, mass production of penicillin, radar, and long range missiles . . ."[27]

The renewed pursuit of private research support reflects the current state of government funding and the Reagan administration's attempts to shift more research and development funding to the private

sector. The research university is driven to the private sector now by its need for dollars to support research and upgrade scientific instrumentation for its laboratories. Such collaboration also "can bring important advantages to graduate students and young scientists, both in terms of support for graduate study and in postdegree employment."[28]

Explaining the motivations for universities to seek industry support for research, the presidents of five major research universities summed it up this way following a two-day conference on biotechnology in March, 1982:

> First, there is a genuine interest in facilitating the transfer of technology - from discovery to use - to contribute to the health and productivity of society; second, there is interest in ongoing dialogue between academic and industry which could improve the level of applied science by close association with industry applications; and, third, academic institutions and their faculty members are feeling particularly hard-pressed financially and see such cooperation with industry as a way of compensating for a small but important part of the support lost from federal sources.[29]

For its part, industry is looking to exploit knowledge for commercial gain - to improve productivity and bring out innovative products. By creating an alliance with research universities, industry gains access to students and professors as well as university facilities and technology. Such a relationship, particularly with a leading university, also may enhance a company's image or lend credence to a project. If nothing else, the distribution of $22 million in grants to educational institutions in 1982 is good public relations for a corporation like IBM.

Forging New Ties

The signs of an increased university-industry research connection are numerous. In recent years, multimillion-dollar research agreements have been struck between such institutions as Harvard and Monsanto (as well as Du Pont), MIT and Exxon, Washington University in St. Louis and Mallinckrodt Inc., and Westinghouse. Ongoing associations between university and industry have produced the prestigious Research Triangle Park in North Carolina and the Stanford Industrial Park. In addition, leading chemical companies have banded together to form a Council for Chemical Research to fund projects and the Semiconductor Industry Association has established a nonprofit subsidiary to encourage long-term semiconductor research between manufacturers and universities.[30]

Montana State University is among many institutions working to forge new relationships with industry. About one out of every five research dollars at MSU comes from such private sources as Monsanto, General Electric, Shell Development Corp., Conoco, Peabody Coal Co., Decker Coal, Great Western Sugar Co., Holly Sugar Corp., Continental Grain Co., International Harvester, Diamond Shamrock Chemical Corp., Dow Chemical Co., and Du Pont.[31] The sources of funding reflect MSU's land-grant orientation, with many of the private companies funding research in agriculture and engineering.

A Question of Balance

The increased cooperation between industry and university has prompted debate about traditional academic values and the role of professor and institution. Difficult and searching questions are being

asked about conflicts of interest, preserving the traditions of open research, the propriety of universities aggressively seeking patents and licenses, the impact of industry support on research priorities, and the ethics of universities holding stock in companies owned by faculty members.

The bio boom, as it has been called, illustrates perhaps more than any other recent development, the emergence of the professor who acts not only as researcher and project manager, but as business executive and stockholder. Biotechnology companies have offered stock and top positions to sought-after biologists, some of whom have formed their own companies while remaining employed by their university.[32] Stanford University President Donald Kennedy, whose own university relies heavily on research dollars, has sharply attacked the "appalling lack of restraint by some biomedical scientists in responding to commercial opportunities based on their research."[33]

Kennedy has warned that unless scientists firmly reject the temptation to commercially exploit their research, "the public will be perfectly entitled to conclude that the scientists are more interested in profits than results."[34] Newsweek magazine echoed that concern in a story on the commercialization of biology, asking, "Will the sound of the cash register drown out the clink of test tubes in university biology labs?"[35] The magazine noted that the commercial potential of biology was affecting research practice and priorities and creating conflicts of interest with professors leading double lives as researchers and businessmen.[36]

Critics and friends of the university may well question the morality of it all and ponder whether the institutions are morally strong enough to withstand the powerful - but not necessarily negative - influence of industry and reject grants or contracts that do not fit the university's mission. Will the utilitarian demands of industry increasingly divert university attention away from basic research and the sharing of results? How much control can universities expect to have over privately-funded research projects and the uses of those projects?

The bio boom has prompted some researchers to guard their research closely, refusing to share their information with colleagues. Concerns also have been raised about professors redirecting the work of graduate students in order to explore areas of commercial interest.[37] With patents and ideas at stake in this multimillion-dollar business, researchers and the companies backing them see a compelling interest in keeping their findings private. Time magazine notes that some observers are skeptical that "the pursuit of pure knowledge (can) be compatible with the pursuit of profit."[38]

> Most contract grants between business and universities allow the donor corporation to review findings before publication, ensure exclusive patent rights and sometimes keep key data secret so competitors will not get them. While many technological breakthroughs have resulted from purely theoretical research, corporations tend to be more interested in encouraging short-term solutions to specific problems or in developing products. Concedes Wilbert Ferguson, a Westinghouse engineering director, discussing his firm's arrangement with Carnegie-Mellon: "There may be an element of support for academic research, but we really are trying to get as much out of it as we can."[39]

MIT historian David Noble and others suggest that universities have permitted "corporate America" the kinds of privileges involving

scientific research that they would never yield to government. Noble notes that while university administrators and researchers rail against any kind of government inquiry into research, they have been slow to raise their voice against similar private questions or even control. Noble suggests that universities should be required to demand contracts that give the public some return for its investment with research that leads to somebody's profit.[40]

Balancing the Question

The problems that have developed in the relationships between universities and industry were explored in the conference on bio-technology mentioned earlier. The conference was attended by the presidents of five leading research universities: Donald Kennedy, Stanford; Marvin Goldberger, California Institute of Technology; David Saxon, University of California; Derek Bok, Harvard; and Paul Gray, Massachusetts Institute of Technology. Also attending the Pajaro Dunes, California conference were faculty scientists, industry representatives and other university administrators.[41]

Such issues as patent licensing and professorial conflict of interest were discussed and guidelines set out as part of an effort toward formulating policy at universities. A draft statement released by participants included the following highlights:

> 1) "Universities are a repository of public trust and, in many cases, of public funds as well, and they have an obligation to the public as well as to their students and faculty to ensure that they remain devoted to their primary goals of education and research, and that their resources be properly used in the pursuit of these goals.[42]

2) "It is important that universities and industries maintain basic academic values on their research agreements. Agreements should be constructed, for example, in ways that do not promote a secrecy that will harm the process of science, impair the education of students, interfere with the choice by faculty members of the scientific questions or lines of inquiry they pursue, or divert the energies of faculty members from their primary obligations to teaching and research.[43]

3) "The traditions for open research and prompt transmission of research results should govern all university research, including research sponsored by industry. Those traditions require that universities encourage open communication about research in progress and research results. However, as discussed below, it is appropriate for institutions to file for patent coverage for inventions and discoveries that result from university research. This action may require brief delays in publication or other public disclosure.[44]

4) "It is important that universities not influence the nature of the research proposed by professors, postdoctoral or fellow students by pressing them to do work of potential commercial importance or to become involved in other commercial activities. Professors may choose to delay the publication of research findings for a brief period to permit the timely filing of patent applications, but, absent a contractural obligation, universities should not try to prevent faculty members from publishing or disclosing their research findings in order to preserve the universities' patent rights.[45]

5) "Professors' relationships with commercial firms should not be allowed to interfere with their overriding obligation to the university to fulfill their primary responsibilities of teaching and research."[46]

Participants to the private conference stressed that they viewed this set of principles as a "contribution to further consideration" of those issues confronting the university-industry partnership. Each university should address the problems, participants said, suggesting that "(d)ifferent rules and procedures may well be appropriate to suit the special circumstances and traditions of different institutions."[47]

In other words, one might conclude, it's business as usual for universities which always can cite a special circumstance or tradition

(essentially saying "we've always done it that way") to justify a questionable practice. High-minded ideals can fall quickly when dollars are involved, even in the university world. Noble, among others, took issue with the fact that the meeting between university presidents and industry representatives was closed to the press and critics of the growing influence of business. "What right do universities, private citizens known as scientists, have to sell, to make deals with public resources," Noble said.[48]

Who Needs Whom?

While universities rightly boast of their "mindpower" and access to the "best people," industry is not dependent on universities for research and development. For the most part, the university needs industry more than industry needs the university. In most cases, industry does not look to the university for those technological breakthroughs that can be translated into profits. Still, most of the basic research carried on in this country is at the university, laying the groundwork for future applications of those discoveries.

Indicative of the relationship between industry and university is the comment by Herbert Fusfeld, director of the Center for Science and Technology Policy at New York University: "While industry is receptive, it is clear that the university is selling, not receiving."[49] The American Association for the Advancement of Science cites figures which show that despite recent well-publicized agreements between university and industry, there has been a small decline in real dollars spent by industry for university research and development.[50]

Table 2 R&D performed by universities and colleges, by source of funds* (in millions)

	1967 Actual	1972 Actual	1980 Actual	1981 Est.	1982 Est.
Current Dollars					
Federal government	$1409	$1795	$4093	$4400	$4600
Industry	48	74	235	260	275
Universities & colleges	345	574	1313	1490	1600
Other nonprofit	119	187	408	450	475
Total	$1921	$2630	$6049	$6600	$6950
Constant 1972 dollars					
Federal government	$1939	$1795	$2194	$2094	$2010
Industry	66	74	126	124	120
Universities & colleges	475	574	704	709	699
Other nonprofit	164	187	219	214	208
Total	$2643	$2630	$3242	$3142	$3037

Source: National Science Foundation, data for National Patterns of Science and Technology Resources: 1982. Conversion to constant 1972 dollars by authors based on OMB deflators.

*Amounts represent current operating costs, based on data by performers of R&D, and do not correspond exactly to the figures for R&D in the federal budget used in the text. Capital expenditures are generally excluded.

Reprinted from Research and Development AAAS Report VII: Federal Budget FY 1983 Impact and Challenge (Washington, D.C.: American Association for the Advancement of Science, 1982), p. 148.

A review of the table shows that the federal government provides about two-thirds of the money spent for research and development at universities and colleges. The institutions themselves provide the next largest amount followed by nonprofit organizations and then industry.[51] Clearly, the private sector cannot begin to provide the level of funding that universities have grown accustomed to receiving from the federal government. While the university's share of those private dollars could

grow, the institutions are left with the difficult, but not insoluable, problems of what type of research they will conduct and on what grounds.

Edward E. David Jr., president of the Exxon Research and Engineering Co., believes that the nation is entering a new era characterized by the growth of industry-supported research at the university level. Calling increased industry funding for research economically and socially desirable, David projects that industry's support will triple this decade to about $600 million a year. That would result in an increase from about four percent to 15 percent of the funding provided by the federal government, assuming government support remains constant in real dollars.[52]

If such growth is to take place, David suggests, then both company and campus will have to find ways to accommodate their cultural differences. Academic science must recognize that "the over-riding goal for industry is the delivery of goods and services to the public, governments, and other consuming institutions," he notes. Industry must recognize that educational values are important and that the primary aim of university researchers is the creation of knowledge, he adds.[53]

David is confident that industry and university can work together, noting that Exxon is involved in numerous ways with universities through programs and jobs for students and faculties, consultancies, contract research and faculty advisory groups. He suggests that both institutions explore the possibility of creating more research consortia similar to those at Carnegie-Mellon, University of Delaware, Cal Tech,

University of California at Berkeley, MIT, and Stanford.[54] The advantages of such a relationship are mutual, he contends:

> The research consortia is clearly popular with industry. It represents a low-cost, low-risk option for ensuring that basic research of importance to industry continues or expands. It also represents a low-cost, low-risk option for the universities, because it scarcely threatens their traditional concerns, values, and interests. With many companies involved, none is in a position to exert a strong influence on research directions. For similar reasons there are few problems with publishing results, though there can be delays to allow for patent filings. Industry participants are almost always willing to allow universities to hold the patents.[55]

David cautions, however, that it is not clear whether such consortia are making enough scientific progress and coming up with enough technological innovations to justify the millions of dollars being poured into them.[56] Industry appears willing to foot the bill for various educational programs and research, but it expects something in return. David echoes the view of other business leaders that the single most important activity of the university is producing a steady supply of well-educated, well-trained graduates. That is followed in terms of priority by an emphasis on "relevant basic science, and scientists able to offer fresh insights; and, sometimes, technological ideas and leads."[57]

Concluding Comment

If they are to become good partners, the university and industry must acknowledge basic differences in their priorities and interests, and work from there to strike a balance. It is the responsibility of the university to protect its integrity and ensure that its professors are

free of both internal and external pressures in their conduct of research. To even expect industry to act as the conscience for the university is unrealistic and unfair. The university must assert itself and be willing to turn down research funding, however needed, if that funding carries an unacceptable pricetag. In its pursuit of dollars, the university must guard against striking some sort of Faustian bargain that would place the campus under the indirect control of outside interests that have little regard for the public or institutional ethics. It is one of the prime responsibilities, after all, of the university to unmask false claims and rail against "unprincipled self-seekers." The bitter irony is that some universities could find themselves acting unprincipledly in the name of survival and at untold cost to institutional values and interests.

There are many good reasons for MSU to conduct and even expand its research program, thereby benefitting not only the institution, but students and the state. If MSU keeps the latter two interests uppermost in mind, it can justifiably argue that what is best for MSU is also in the best interests of Montana.

FOOTNOTES

[1] Dael Wolfle, The Home of Science: The Role of the University (New York: McGraw-Hill Book Co., 1972).

[2] Ibid, p. 131.

[3] Ibid, p. 134.

[4] Ibid, pp. 134-135.

[5] Ibid.

[6] Robert Oppenheimer, quoted in Dael Wolfle, The Home of Science, The Role of the University (New York: McGraw-Hill Book Co., 1972), p. 131.

[7] Ibid.

[8] Greg Northcutt, Ag Research: Your Harvest of Dividends (Bozeman, Mont.: Montana Agricultural Experiment Station, 1980)), p. 1.

[9] Ibid.

[10] Office of the Vice President for Research, Montana State University, Report on Research 1980 (Bozeman, Mont.: Montana State University, 1981), p. 4.

[11] Ibid.

[12] Ibid.

[13] "Study Shows Academic Prestige Hasn't Changed Much in Last Decade," Released by Associated Press, 1 January 1983.

[14] John D. Millett, Management, Governance and Leadership: A Guide for College and University Administrators (New York: AMACOM, 1980), pp. 65-66.

[15] Based on review of academic backgrounds of faculty as outlined in 1982 college catalog.

[16] "Private Universities Face Growing Competition for Research Funding," Stanford University News Service release, 2 February 1983.

[17] National Science Foundation, "R&D Funds Fiscal Year 1980," Surveys of Science Resources Series, NSF 82-300.

[18] Chester E. Finn, Jr., Scholars, Dollars and Bureaucrats (Washington, D.C.: The Brookings Institution, 1978), p. 112.

[19] Ibid.

[20] Robert M. Rosenzweig, Research Universities and Their Patrons (Berkeley: University of California Press, 1982), pp. 16-17.

[21] Willis H. Shapley, "Congress Tempered Reagan on '83 Federal Research Budget," Science News 123 (29 January 1983), p. 72.

[22] Ibid.

[23] Ibid.

[24] Rosenzweig, p. 19.

[25] Ibid.

[26] Ibid, p. 46.

[27] Colin Norman, Knowledge and Power: The Global Research and Development Budget (Washington, D.C.: Worldwatch Paper 31, July 1979) p. 15.

[28] Rosenzweig, p. 49.

[29] Draft statement by participants in the Pajaro Dunes conference. Released through Stanford University News Service, 29 March 1982.

[30] Lewis M. Branscomb, "America's Rising Research Alliance," Enterprise, August 1983, p. 5.

[31] Office of the Vice President for Research, Montana State University, 1983.

[32] Ivars Peterson, "Academic Questions: Campus and Company Partnerships," Science News 123 (29 January 1983), pp. 76-77.

[33] "Kennedy Urges Greater Self-Regulation Among Scientists, Scholars," Stanford University News Service release, 19 October 1982.

[34] Ibid.

[35] "The Big Bucks of Biology," Newsweek, 5 April 1982, p. 69.

[36] Ibid.

[37] Ibid, p. 70

[38] "Pure Knowledge vs. Pure Profit," Time, 28 September 1981, p. 63.

[39] Ibid.

[40] No title, Stanford University News Service release, 30 April 1982.

[41] Draft statement from Pajaro Dunes conference.

[42] Ibid.

[43] Ibid.

[44] Ibid.

[45] Ibid.

[46] Ibid.

[47] Ibid.

[48] Stanford University News Service release, 30 April 1982.

[49] Peterson, p. 77.

[50] Willis H. Shapley, Albert H. Teich, and Jill P. Weinberg, Research and Development AAAS Report VII: Federal Budget - FY 1983 Impact and Challenge (Washington, D.C.: American Association for the Advancement of Science, 1982), p. 148.

[51] Ibid.

[52] Edward E. David, Jr., "The Corporation on Campus - Supporting Research with a Commercial Mission," Change, (September 1982), p. 26.

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[54] Ibid, pp. 27-28.

[55] Ibid, p. 28.

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[57] Ibid, pp. 27-28.

Chapter 4

THE UNIVERSITY AS AN ORGANIZATION

Introduction

Many of the problems that administrators face in managing colleges and universities during this period of financial austerity and internal stress are heightened by the structural or functional makeup of the university. The type of organization in which administrators and faculty members work dictates to varying degrees how and what kinds of policies and decisions are made. This can be both a positive and negative experience for all parties involved as this chapter will examine in presenting four models of university governance. The tremendous impact of enrollment on public funding of the university also will be explored in terms of its effect on the decisions that are made about institutional survival.

Ambiguous and Complex Organizations

Colleges and universities are unique and complex organizations which have many goals, some defined and some assumed, and which serve a variety of interests. They differ in many respects from the business firm, government bureau and such Third Sector organizations as the hospital, foundation and service institution. Colleges and universities also differ among themselves in terms of public or private control, system of management, funding, clients, priorities, missions,

and needs. Some observers have gone so far as to suggest that colleges and universities do not know what they are doing, leading J. Victor Baldridge to observe: "If at times colleges and universities do not know clearly what they are trying to do, they often do not know how to do it either."[1]

Baldridge describes goal ambiguity as one of the chief characteristics of academic organizations. Questions about just what it is they're supposed to do are not a problem for most other organizations. The business firm, for example, is in the business of making a profit. Hospitals treat sick and injured people, deliver babies and - it could be argued - increasingly are in the business of making a profit. Government bureaus carry out their duties as prescribed by rules and regulations. Virtually alone among these organizations is the university, which "often tries to be all things to all people."[2]

As noted earlier, land-grant institutions like Montana State University have a three-fold mission of teaching, research and public service. But few academics would argue that the university's mission is limited to those three specific areas. In displaying an unwillingness to say "no" to any number of new responsibilities, universities have assumed such tasks as promoting the arts, managing institutes or scientific facilities and sponsoring a host of intercollegiate sports programs that, at the highest levels, turn a profit and attract more publicity than all research programs combined.

Not only are most university goals ambiguous, but they are carried out by faculty members who demand autonomy in their work and have split loyalties to the institution and their discipline and peers. Further,

faculty members chafe at the suggestion that anyone but their colleagues are qualified or knowledgeable enough to judge their research and teaching.[3] Their independence, which creates any number of problems for administrators, is strengthened through tenure and obtaining research grants. Richard Cyert observes:

> The faculty member not only has independence in the classroom but also gains additional independence because he is a source of revenue to the organization through his research efforts. By getting outside grants he pays for part of his salary and part of the overhead expense of the university. If indefinite tenure is added to the other elements of independence, it can be seen that the concept of "managing a faculty member" can be difficult.[4]

Colleges and universities also are vulnerable to an environment that includes government agencies, politicians and interest groups which can range from students to taxpayers. The influences or pressures that these groups can bring to bear on an institution can dramatically alter its goals, norms and curriculum. Comments Baldridge:

> Although colleges and universities are not entirely captured by their environments, they are steadily losing ground. As their vulnerability increases, their governance patterns change significantly.[5]

Universities, then, are complex organizations with ambiguous goals that serve a variety of interests. Although they sometimes seem isolated, they are subject to external pressures and the independence of their faculty members. When combined with fiscal constraints and shrinking enrollments, it becomes clear why managing a university is a difficult task that can wear down even the strongest president. Underpinning all of this is the structure of academic governance in place at a particular university. Four models of governance - bureaucratic, collegial, participatory democracy and organized anarchy - will

be examined in the following pages with an assessment of their strengths and weaknesses.

Bureaucratic Model. Max Weber's classic model of bureaucracy, with its power and authority situated at the apex, is a familiar starting point for any discussion of the college as a complex organizational system. Typical characteristics of bureaucracies include a chain of command, division of labor, specialized responsibilities for trained experts, governance by a consistent set of rules and regulations, and employees hired for their knowledge and who are politically neutral.

Suggesting that university governance could be more fully understood by applying the bureaucratic model, Herbert Stroup notes that some characteristics of the academic organization fit Weber's description of a bureaucracy. They include:

1. "Competence is the criterion used for appointment.[6]

2. "Officials are appointed, not elected.[7]

3. "Salaries are fixed and paid directly by the organization, rather than determined in "free-fee" style.[8]

4. "Rank is recognized and respected.[9]

5. "The career is exclusive; no other work is done.[10]

6. "The style of life of the organization's members centers on the organization.[11]

7. "Security is present in a tenure system.[12]

8. "Personal and organizational property are separated."[13]

Expanding on those observations, Baldridge notes that the university operates under state charter, like most other bureaucracies; that the university has a formal hierarchy that includes not only

presidents and deans, but professors, instructors and research assistants; that formal channels of communication exist; that there are bureaucratic authority relations with some officials exercising authority over others; that formal policies and rules that govern much of the institution's work exist; and that routine decisions often involve bureaucratic decision-making processes.[14]

While acknowledging these characteristics, Baldridge maintains that there are weaknesses in the bureaucratic model, especially as applied to decision-making processes.

> First, the bureaucratic model tells us much about authority - that is, legitimate, formalized power - but not much about informal types of power and influence, which may take the form of mass movements or appeals to emotion and sentiment. Second, it explains much about the organization's formal structure but little about dynamic processes that characterize the organization in action. Third, it describes the formal structure at one particular time, but it does not explain changes over time. Fourth, it explains how policies may be carried out most efficiently, but it says little about the critical processs by which policy is established in the first place. Finally, it also ignores political issues, such as the struggles of various groups within the university.[15]

For the most part, academicians reject the bureaucratic model as an accurate description of university governance, but acknowledge that many of its elements can be found in the university. There is little question that a bureaucracy is at work when students are admitted to college by the admissions office; arrange to live in a residence hall through the housing office; schedule classes through the registrar; and pay their bills to the business office. Further, faculty members must deal with formal policies and rules, budget guidelines, and various administrators in a hierarchy of departments, colleges, senate and enough committees that a Committee on Committees exists at Montana

State University. The bureaucratic structure is an affront to many professors who, priding themselves on their professionalism and individuality, chafe at a formal hierarchy. Still, it is the contention of this paper that no model comes closer than the bureaucratic pattern to reflecting the system of governance at MSU. The university operates under a strong central management with faculty members more or less accepting that role to the extent that they are nonunionized and relatively content in carrying out their research and teaching.

Collegial Model. On a national basis, many faculty members clearly prefer the collegial decision-making model. While this model exists in varying degrees, it would be a mistake to embrace its apparent attractions or ideals as reality. The collegial model, which has been associated with the University of Montana, is also called the "community of scholars" model. The model encompasses three themes: decision-making by consensus, the professional authority of faculty members, and the call for more humane education.[16]

> This approach argues that academic decision-making should not be like the hierarchical process in a bureaucracy. Instead there should be full participation of the academic community, especially the faculty. Under this concept the community of scholars would administer its own affairs, and bureaucratic officials would have little influence.[17]

The collegial model is viewed as an alternative to the impersonal bureaucracy and places authority with professionals who value their autonomy, are self-motivated and resent organizational oversight. John Millett, a proponent of a strong faculty role in governance, believes faculty members should play a major role in "formulating purposes, policies, programs and budgets relating to instruction, research, and public service . . ."[18]

As the university has grown and become an increasingly complex operation, the collegial model has been supplanted by more practical models. Faculty members at the nation's larger institutions, those with 20,000 or more students, can scarcely expect to resolve issues in a town meeting atmosphere. We live in an era of specialists and experts and there is little room for the professor to dabble in management. Even at smaller institutions like MSU and the University of Montana, the problem still remains one of too many voices with little chance of reaching a sweeping consensus on most issues. At some point, decisions and policies must be hammered out and orders given. Burton R. Clark, discussing the shift away from the "community of scholars," notes:

> The professor retains a few interests in common with all others, such as higher salaries, but he has an increasing number of interests that diverge. Even salary is a matter on which interests may diverge, as men bargain for themselves, as departments compete for funds, as scientists are paid more, through various devices, than the men of the humanities.
>
> The modern campus can no longer be coordinated across its length and breadth by informal interaction and by the coming together of the whole. Campuswide coordination increasingly moves toward the means normal to the large-scale organization, to bureaucratic means.[19]

Political Model. The third model that experts identify is the political, which asserts that conflict is a very real part in the debate over university issues. This model suggests there are "interest group dymanics and conflicts similar to those in cities, states, or other political entities."[20]

Baldridge notes that the political model focuses on policy-forming processes, which largely determine an organization's goals and sets

strategies for reaching those goals. The political model is characterized by the inactivity of many participants, with policy making often left to administrators. Interest groups such as faculty, students or citizens may mobilize on a particular issue, with decisions often made based on the actions of the most persistent groups.[21]

While one can apply the political model to certain processes, many decisions are the result of routine bureaucratic processes. "Many, perhaps most, decisions are made not in the heat of political controversy but according to standard operating procedures," Baldridge notes.[22] The political model, like the others, offers a way at looking how decisions are made, and is not all-encompassing.

Organized Anarchy. While each of the three models - bureaucratic, collegial and political - can be found within the university, Cohen and March, among others, contend that none satisfactorily conveys the character of the college organization. In their view, the academic organization is an "organized anarchy" with little central coordination or control.[23] They believe the college and university exhibit the following properties:

> It does not know what it is doing. Its goals are either vague or in dispute. Its technology is familiar but not understood. Its major participants wander in and out of the organization. These factors do not make a university a bad organization or a disorganized one; but they do make it a problem to describe, understand, and lead.[24]

Baldridge responds that the term "organized anarchy" is probably exaggerated and that it suggests more confusion than actually exists. Still, he acknowledges, it serves to challenge existing conceptions and describes a looser kind of organization than many administrators might admit.[25]

> The organized anarchy differs radically from the well-organized bureaucracy or the consensus-bound collegium. It is an organization in which generous resources allow people to go in different directions without coordination by a central authority, leaders are relatively weak and decisions are made by individual action. Since the organization's goals are ambiguous, decisions are often by-products of unintended and unplanned activity. In such fluid circumstances, presidents and other institutional leaders serve primarily as catalysts or facilitators of an ongoing process. They do not so much lead the institutions as channel its activities in subtle ways.[26]

Role of President

The characteristics of the bureaucratic, collegial and political models of governance are perhaps best exemplified by the role of the university president in each. Under the bureaucratic model, the president stands at the apex of power and holds much of the organization's power. He is expected to bring problem-solving skills and technical ability to his office. Baldridge suggests that he is looked to as the hero, but that this image is out of context in an organization whose power is more diffuse than in business organizations.[27]

Under the collegial model, the president is viewed as "first among equals" in a community of scholars. He is expected to treat faculty members as valued colleagues and peers, not employees. He listens, rather than commands, and hopes to reach decisions through negotiation and compromise.[28]

Under the political model, a president must pull various groups together to achieve change. He is a statesman who relies on a "cabinet" form of administration and negotiates between power blocs.[29]

Clearly, the college and university embody a mixture of these three models and the organized anarchy model, with presidents called upon to lead, cajole, negotiate and mediate. A good president will seek

input and advice from others, including his cabinet, faculty members, students, alumni, legislators, and others, depending on the issue. Assessing the elements of these approaches, one may argue that they're all found at MSU: the rational problem solving of the bureaucratic model, the political model's emphasis on mediation, the collegial model's compromise, and the fluidness of organized anarchy.

But it is the bureaucratic model that perhaps best fits the style of governance at MSU, as evidenced by the decision to emphasize research. This decision clearly was made at the top, undoubtedly with input from leading researchers who understandably would like additional assistance and recognition. The question of research was not viewed as an issue for debate, with town hall-like meetings to discuss the ramifications of increased research on such areas as the budget and staff time. Most faculty members at land-grant institutions appreciate and value the role of research, but certainly they also prize the missions of teaching and public service. Upon becoming president of Montana State University, William Tietz apparently believed that the mission of research at MSU had slipped and that this imbalance between the three traditional missions could best be addressed by moving decisively to encourage and reward research.[30]

Presidential Power and Research

It is interesting to note that some academic observers believe that a push for increased research and dollars can lead to a shift in power from the administration to the faculty. Kenneth P. Mortimer and T.R. McConnel suggest that "faculty recipients of large research grants have greater status in the academic community than presidents and other

administrative officers and resist administrative 'domination.'"[31] Cohen and March contend that where the research reputation is strong, universities tend to have presidents who are weak and relatively minor figures.[32] They note:

> Outstanding faculty at major institutions control substantial resources directly through research grants; they can and do use that control and the threat of departure (with consequent loss of funds and reputation as a device for influencing the allocation of other resources). In recent years at major universities the teaching load in physics has very rarely been as great as the teaching load in French.[33]

Conversely, greater budgetary control generally would flow to most presidents in times of financial constraint or duress. At an institution like MSU, the president enjoys great latitude in deciding questions of finance and allocation of resources. One of Tietz's early moves was to help bring about the formation of three programs designed to enhance faculty excellence in three areas: research, teaching and creativity. A total of $285,000 was disseminated by faculty committees under the three programs. Convinced that MSU must do more to fulfill its land-grant commitment to research, Tietz also re-emphasized the importance of research as the university moved to fill various vacant administrative positions.[34]

Concluding Comment

The actions of Tietz reflect the range of powers that presidents in a bureaucratic model enjoy and can utilize to realize their goals and priorities, sometimes to the consternation of some faculty members. In times such as these, a president may argue, the university which acts and speaks with one voice can protect its position and perhaps gain a step on its competition. The danger, of course, is that in moving too

swiftly internal cries of dissent or simple questions may be ignored or never heard. And that can lead to the creation of unrest and turmoil among faculty members which even a president with broad powers may not be able to quell without destroying his own base.

FOOTNOTES

[1] J. Victor Baldridge et al., "Alternative Models of Governance in Higher Education," in Governing Academic Organizations: New Problems, New Perspectives, eds. Gary L. Riley and J. Victor Baldridge (Berkeley, Calif.: McCutchan Publishing Corp., 1977), p. 4.

[2] Ibid, p. 3.

[3] Ibid, p. 4-5.

[4] Richard M. Cyert, "The Management of Universities of Constant or Decreasing Size," Public Administration Review, 38 (July/August 1978), p. 344.

[5] Baldridge, p. 6.

[6] Herbert Stroup, Bureaucracy In Higher Education (N.Y. Free Press, 1966), quoted in Baldridge, p. 9.

[7] Ibid, p. 10.

[8] Ibid.

[9] Ibid.

[10] Ibid.

[11] Ibid.

[12] Ibid.

[13] Ibid.

[14] Ibid, p. 14.

[15] Ibid, p. 11.

[16] Ibid, p. 15.

[17] Ibid, p. 11.

[18] John D. Millett, Management, Governance and Leadership: A Guide for College and University Administrators (New York: AMACOM, 1980), p. 154.

[19] Burton R. Clark, "Faculty Organization and Authority," in Governing Academic Organizations: New Problems, New Perspectives, eds. Gary L. Riley and J. Victor Baldridge (Berkeley, Calif.: McCutchan Publishing Corp., 1977), pp. 70-71.

[20] Baldridge, p. 14.

[21] Ibid, p. 14-15.

[22] Ibid, p. 18.

[23] Michael D. Cohen and James G. March, Leadership and Ambiguity (New York: McGraw-Hill Book Co., 1974), p. 2.

[24] Ibid, p. 3.

[25] Baldridge, p. 25.

[26] Ibid, p. 8.

[27] Ibid, p. 21.

[28] Ibid, pp. 21-22.

[29] Ibid, pp. 22-23.

[30] Lauren McKinsey interview with Montana State University President William Tietz for Montanans On a New Trac for Science report, Bozeman, Mont., 6 September 1979.

[31] Kenneth P. Mortimer and T.R. McConnel, Sharing Authority Effectively (San Francisco: Jossey-Bass Inc., Publishers, 1978), p. 159.

[32] Cohen and March, p. 100.

[33] Ibid.

[34] Interview with Montana State University President William Tietz, Bozeman, Mont., 5 April 1984.

Chapter 5

OBSTACLES AND STRATEGIES FOR EXCELLENCE

Introduction

Planning at the university level characteristically has been marked by preparation for ever growing enrollments, but this is changing with the decline in the college-age population. Shrinking enrollments are creating severe problems for institutions whose budgets are tied to enrollment, forcing them to explore such alternative sources of funding as research grants and contracts. The pursuit of research monies is explored in this chapter along with the constraints on research at MSU, questions surrounding planning and what appears to be the growing popularity of launching strategic planning efforts to forestall cutbacks that may be inevitable.

Research Expansion

Montana State University's plan to expand research at a time when the national focus is on contraction in higher education may be viewed as falling somewhere between vision and delusion. At the worst, a university president who appears to emphasize research above such responsibilities as teaching and public service risks antagonizing faculty members and his own governing board. That may or may not be happening at MSU. It should be remembered that the path to survival will vary among institutions. A growing number, for example, are

turning away from research in an attempt to focus their efforts on holding their share of a shrinking 18-year-old college student population. A second target for these institutions is attracting an older, less traditional clientele. Other institutions, meanwhile, are shifting their sights toward attracting research funds in the hope of offsetting the loss of students and the money they bring. Under this scenario, an institution can't help but become a little more of a research institute and a little less of a university.

Implications of Declining Enrollment

The root of the problem for many institutions is the simple passing of the last of the baby boom from the nation's high schools. Under an enrollment-driven system, a decline in enrollment can easily result in loss of funding and a cutback of faculty members and services. From there it is an easy jump to closure or yielding to temptation to lower admission standards to try and keep enrollment up.

The Carnegie Council on Policy Studies in Higher Education notes that:

> Such a system (the student-driven funding model) works better in a period of expansion than of contraction: and we now face a time of contraction. In a period of expansion, among other things, money can be more easily siphoned off to support academic guild interests. Declining costs per additional student help this with state financing based upon higher average costs, with a resultant gain for the institution in between. In contraction, costs climb back up the steeper marginal cost curve, as fixed overhead is spread over fewer students, and put on pressure to cut into nonessentials - nonessentials in attracting and holding students.[1]

In its report, the council projects a decline in undergraduate enrollment ranging from 5 to 15 percent from 1978 to 1997.[2] Others

predict a decline as steep as 40 to 50 percent, a plunge that would sweep almost all institutions into trouble.[3] Montana State University continues to buck national projections of declining enrollment. However, the university is projecting a moderate decline in the number of students starting in 1984. The Office of Institutional Research projected an enrollment of 11,359 for 1983 (which was on target with the 1983 fall enrollment hitting 11,447) as well as the following: 1984, 11,241; 1985, 11,029; 1986, 10,717; and 1987, 10,702.[4]

While enrollment has been healthy at MSU and officials do not foresee the sharp drops in enrollment predicted for other institutions, the Montana Legislature continues to refuse to fully fund enrollments at MSU - or any other unit of the university system, for that matter. This has placed the institution in the position of having to stretch its budget and reallocate resources. The university, in effect, is penalized for its success in attracting students to Bozeman. Since the institution must accept Montana high school graduates virtually regardless of their academic standing, it is all but impossible to hold freshmen enrollments down. Rigorous academic programs, however, are used to "weed out" students in certain areas.

Constraints on Research

Given the tight fiscal situation it operates under, MSU is pressing for other sources of revenue and has identified research as an area that can both enhance and enrich the university. This emphasis on research has brought into sharp focus the constraints that MSU and its researchers face. Major constraints or those on the horizon include: a

period of dwindling resources, uncertain enrollments, the state's reluctance to fund basic research, geographic isolation, dilution of resources within the state with the six units of higher education, federal budget cuts, and the state's interest in funding full-time teachers, not researchers.

A 1979 report on the National Science Foundation faculty development program Montanans on a New Trac for Science (MONTS) described a perception that "research at Montana State University is in pretty good shape considering the external constraints in operation."[5] It went on to note:

> The physical isolation of Montana will always stand as a real barrier, costly to break down. Montana State University will probably never grow out of middle-size status, falling short of the critical mass necessary to achieve a major research reputation; research excellence will have to be selectively developed. The Montana social climate and political culture is unlikely to change from its emphasis on training Montanans for jobs and solving Montana related problems: basic research will have to be supported largely by the never-ending search for extramural funding.[6]

The university, in formulating its goals, must acknowledge that the cost of operating a research-oriented institution is high. Such universities need high-caliber libraries, laboratories, equipment, technical support personnel, and graduate students. An increasingly austere funding environment and the political and social climate of Montana raise some unavoidable questions for MSU if the institution is determined to expand and upgrade research.

The underlying question clearly remains: Should MSU attempt to emulate the major research universities by focusing more resources on laboratories and graduate programs? Or should it remain a service-oriented institution whose applied research program and history of

training students for careers principally within Montana is well-documented? The MONTS report, written by MSU political scientist Dr. Lauren McKinsey, outlined the liabilities of blindly pursuing grants and contracts and opts for selective research excellence and retrenchment.[7] That assessment, or perhaps a far more narrow sentiment, probably would still be found among most Montanans.

It would be safe to venture that few Montanans have aspirations to build Montana State University into an institution that ranks among the top research universities. Basic research is generally viewed as being outside the university's sphere of responsibilites - or, if included, it is considered the funding responsibility of the federal government and private business. The university, while perhaps representative of the state's conservative and practical outlook, does not inspire the kind of cherished support that Nebraskans, for instance, bestow on the University of Nebraska in Lincoln. The issue goes far beyond athletics as a statewide review of daily newspaper and television coverage of the University of Nebraska indicates. The University of Nebraska's chancellors and presidents are virtually household names in that state and are regularly honored by various organizations. The state's leading newspaper, the Omaha World-Herald, regularly carries stories on Nebraska's research programs and professors. The university's governing board holds its meetings at sites around the state and those meetings are covered by the media as major news events. When Nebraska professor John Janovy pens a best-selling and critically-acclaimed book, the story is featured on the cover of the World-Herald's

Sunday Magazine and Nebraskans seem to share a sense of accomplishment.[8] For their part, Montanans seem to expect MSU to educate students first and focus research on "seeking solutions to the immediate problems of Montana's citizens."[9] It may well be that Montanans, as independent a group as any in the nation, do not rely on any of their universities for a sense of identity as Nebraskans seem to do.

Selective Excellence and General Conflict

The MONTS report raised the issue of selective research excellence, recognizing that a comprehensive program in all major sciences will be difficult, if not impossible, to attain at MSU.[10] Which major fields will be encouraged and on the basis of what criteria? Those departments that bring in the greatest amount of grants contend - with some justification - that their productivity merits continued and even increased university support. The "have-nots" argue that if they are to become more competitive in the pursuit of research monies, they will need help to upgrade equipment, purchase computer time and generally improve their research capabilities.

Obviously, there is a real potential for a growing rift between the "haves" and "have-nots" in a time of selective retrenchment. The potential for conflict also exists among faculty members within the colleges and departments of the university organization. Richard I. Miller suggests that "large land-grant universities have a built-in contradiction between those who manage or manipulate the internal rewards system and those who mold the institution's image for its external constituents."[11] Miller perceives an emphasis on research in the rewards system of faculty committees that make the recommendations

on tenure and promotion. Such committees are typically "dominated by comparatively conservative senior faculty members, who hold on to a research bias even if they themselves have not been particularly good examples of its practice."[12]

Miller suggests that two factors may be changing this pattern. First, he contends, the decreasing mobility resulting from austere fiscal conditions has given younger professors a greater voice in personnel decisions, although one could certainly argue that the reverse is true. It would seem young faculty members have few places to turn if they disagree with the internal politics of a university. Miller also contends that a declining student pool has forced faculty members to place a greater importance on teaching in order to retain students.[13] That argument carries greater weight, but in many cases - as suggested in this paper - that has accompanied greater emphasis on obtaining research monies.

Miller believes that from the standpoint of land-grant university presidents and their board members, the most obvious evidence of a successful university to state legislators is one which provides effective public service and teaching. Legislators are more apt to reward public service and teaching than successful research with payoffs that may be diffuse and long-term. Miller aligns the president with board members in emphasizing public service and teaching in order to continue levels of funding.[14] It is worth speculating that under this scenario, a president who emphasizes research above other responsibilities risks the possibility of alienating his own governing board and jeopardizing funding. That is, unless the president can successfully attract outside funding or conduct research with immediate payoffs for the state.

One temptation in pursuing research grants is to accept research that should not be done at the university because it threatens the integrity of the institution. The MONTS report warned:

> Preoccupation with dollar awards can lead to prostitution of both the individual researcher and the university itself. A shift from basic research to applied, program or targeted research in areas such as agriculture, energy and the environment can signal collusion with forces which conceivably could dramatically alter the way of life in Montana. More money is not the answer if it means selling the soul of the University to either the prevailing dominant forces of production in this nation or the growing regulatory machine of the federal government. Let it not be pretended that research dollars are somehow neutral.[15]

In order to keep the university on the right track, a president and his cabinet have a responsibility to chart the direction the university should head. As noted earlier, the president should act in conjunction with faculty members and others in planning and determining policy. Faced with an enrollment shortfall and looming financial problems, a growing number of colleges and universities are turning to strategic studies. The basic principles of this approach appear to have been adapted from warfare.

Strategic Decision-Making

One can almost hear the fanfare of trumpets in George Keller's call to universities "to embrace the new form of strategic decision-making." Keller, a senior vice president of a Maryland institutional, marketing and communications firm, reports that:

> An "almost revolutionary" new managerial strategy is being introduced into American higher education. The new management for higher education is being hammered out blow by blow under the duress of financial deficits, cutbacks, enrollment declines, and the demands of the paying clients.

> Clearly, the simplistic, highly rational plans and the lethargic, highly political incrementalism of the past are not appropriate for higher education today.[16]

Carole Frances, chief economist of the American Council on Education, is among the strongest proponents of strategic planning. Frances advances a model based on strategic planning and contingency budgeting, describing it as a broad and flexible approach to the planning process. Suggesting that the "debate on the best way to prepare for the 1980s is polarizing into two sharply different approaches," Frances contends that strategic planning - which numbers retrenchment among possible outcomes - "cuts the risk - and cost - of being wrong."[17]

Frances describes the alternative approach as "apocalyptic" planning, with supporters of that approach resigned to drops in enrollment and calling for the management of decline.[18] She contends:

> The management of decline approach looks at the future and determines that almost the only possible outcome is large enrollment contractions and then sets out to manage that contraction in a way which transforms the most probable outcome into the only possible outcome. If you plan, manage, and budget for decline, that is precisely what you will get. You may get that result in any event, but with this approach, you make sure you will.[19]

A strong element of hope appears to underlie Frances' interpretation of strategic planning, with the institution urged to consider not only what is, but what might be if everything fell into place. That is a less than realistic approach during a time of financial constraint and retrenchment.

The University of Maryland, a land-grant institution, is among the colleges and universities that have undertaken long-range strategic studies. Maryland is using its 295-page study as a guide toward

realizing its goal of becoming one of the nation's ten best state universities. While planning, or at least talk of it, has been in vogue for years in higher education, Maryland administrators are convinced that "strategic planning" is of the utmost importance if their institution is to evolve as a university second to none.[20] Explains University President John S. Toll:

> We believe planning may well be the most important activity in higher education in the 1980s. Except for several dozen of the most prestigious colleges and universities, any institution that does not look ahead, analyze the new environment and new clienteles, and prepare for academic shifts and new fiscal realities, may have a rocky ride through the decade. Quite a few colleges may not survive.[21]

Toll goes on to define strategic planning as:

> [A] departure from previous planning in that it concentrates on the changing environment surrounding one's institution as much as it pays attention to internal hopes and needs. ..It analyzes the threats and opportunities from the emerging demography, technology, economic and financial trends, political and legal developments, international conditions, and the concerns for changing values and quality of life. It matches department and collegiate wish lists with the probable realities of the society that universities hope to serve.[22]

Future Scenarios

The authors of Three Thousand Futures echo Frances' contention that policies based on current perceptions or views can affect the future for better or worse. The fears include a drop in the college-age cohort (18-21) of up to 50 percent; a deteriorating financial situation caused by tax limitation movements, inflation and a decline in endowment; an erosion in public confidence spurred by false advertising and easy academic credits; growing rigidity among an aging and tenured faculty; students exerting a greater influence simply by choice of where

and in what they enroll; greater public intervention in university affairs; campus governance turning to one of competition and mistrust; and the impairment of research "because young scientists are no longer hired and older scientists tend to become less productive."[23]

At the other extreme, the more optimistic outlooks include: a possible rise in enrollment of up to 40 percent as older persons and foreign students take the place of the traditional college-age cohort; increased student financial aid and unemployment keep youths in college; the end of expansion forces institutions to concentrate on improving the quality of education; faculty members place the long-term welfare of their institutions above private interests; trustees work harder to raise more private funds; students are intelligent consumers who will choose the best institutions and programs, thus ensuring the survival of the fittest; government will exercise self-restraint and allow the institutions autonomy; and federal support of research will be stepped up.[24]

Whose scenario is the most realistic? Even the most optimistic would be hard pressed to defend many of the hopeful outlooks given the economic environment, human nature and current trends. It is likely that aspects of both scenarios are realistic, leaving administrators with the task of selecting (or guessing) which are most pertinent to their institutions. Not to be overlooked are the elements of chance and circumstance which invariably throw the best-made plans awry.

Principle of Substitution

Up to this point, the concepts of planning and selective retrenchment have been stressed. Related to this is the principle of substitution, with the university abandoning or trimming back programs where applicable. Peter Drucker notes that abandonment is difficult because universities and other service institutions are not want-oriented, but "are concerned with good works and with social or moral contributions."[25] The results or products of a university are not easily measured, although one can point to the number of students graduated, research dollars generated and papers published in discussing a university's contributions to society. Not so easily translated to the public is the interaction in a classroom between professor and student or scientific experiments whose payoffs may be years off.

Drucker suggests that the manager of a service institution - the president of a university - must constantly ask:

> "Knowing what we now know, would we get into this activity, this service, this effort if we were not already in it? If the answer is 'no,' one does not say, 'Let's make another study.' One says, 'How can we get out or at least stop throwing additional resources in?'"[26]

Such an approach requires flexibility and the ability to move faculty members to areas of growth that remain true to the ideal of the university. It means trimming programs where necessary, rather than allowing the sheer weight of faculty members in a discipline to dictate curriculum simply on the basis of tenure. While that assessment is not shared by most faculty members, it is difficult to see how a university can expect to survive at public expense when student interests and

societal needs are shifting. This is not to suggest that faculty members should not have as strong a say in the direction of their institution as the administration or various constituencies. It is to suggest that rare is the faculty member who will voluntarily step down for what might be considered the good of the institution - if such a consensus could be reached among all interested parties.

Clashes Over Priorities

Recent incidents at several universities illustrate what can happen when faculties and administrations clash over priorities. The opening of a computer science department at Sonoma State University drew angry protests from laid-off professors, including a former physical education teacher who lamented, "The faculty is supposed to control the curriculum. The curriculum isn't supposed to control the faculty."[27]

A computer sciences department also figured in an incident at Colorado State University, where a report recommended that the department be moved from the Natural Sciences College and placed in the Engineering College. The report was attacked as a "waste of money and time" by the chairman of the computer sciences department,[28] who can be viewed as at least partly protecting his turf in what is a familiar stance even in times of expansion. The report, drawn up by faculty members, students and staff members, also recommended eliminating two colleges through merger and trimming seven of the 57 departments to help streamline the operation.[29]

The third example of faculty in-fighting over priorities is Auburn University, where the faculty is being torn apart in a bitter fight over

whether the university is moving from offering a "comprehensive" education to a focus on engineering and agriculture.[30] Similarly, at MSU there is a possibility that faculty members in the humanities and social sciences could view any strong emphasis on the hard sciences as evidence of an administrative prejudice against the liberal arts.

It is not the intention of this paper to suggest areas which MSU might abandon, but to suggest that selective retrenchment and substitution are important options that can trigger disruption. The entire campus community should be involved in any discussions and studies of possible areas to cut. Guiding any self-assessment should be Drucker's admonition that an institution like MSU "has to be the right size for its market, its economy, and its technology; and the right size is whatever produces the optimal yield from productive resources."[31]

The potential elimination or merging of programs raises fundamental questions about the purpose of a university. For example, is MSU deluding itself by maintaining a small theatre arts department? Or is such a department a necessary part of university life and an important contributor to the university's reputation? The College of Business has shown significant growth in the last several years, reflecting a nation-wide trend. Should faculty positions be pulled from the humanities and reallocated to the business college? One could justify the move in terms of numbers and increase the student-professor ratio in the humanities. While the liberal arts are an integral part of the land-grant university, they often are seen as not being accorded equal status with the professional schools, which university budgeting tends to benefit.

Need for Organizational Fluidity

Increasingly, the emphasis in planning for institutional survival is on flexibility to respond to various enrollment and funding shifts. Flexibility is needed if institutions expect to place themselves in a position to shift resources, trim programs and attract new sources of revenue in order to respond to a changing environment. All of this, it might be said, while paying homage to that traditional trinity of research, teaching and public service.

In their study of successful management in the private sector, Thomas J. Peters and Robert H. Waterman, Jr. determined that America's best-run companies are marked by organizational fluidity.[32] They note:

> We have observed few, if any, bold new company directions that have come from goal precision or rational analysis. While it is true that the good companies have superb analytic skills, we believe that their major decisions are shaped more by their values than by their dexterity with numbers. The top performers create a broad, uplifting, shared culture, a coherent framework within which charged-up people search for appropriate adaptations. Their ability to extract extraordinary contributions from very large numbers of people turns on the ability to create a sense of highly valued purpose. Such purpose invariably emanates from love of product, providing top-quality services, and honoring innovation and contribution from all.[33]

The university, as noted earlier, admittedly is a different organization than those found in the private sector. But, if Peters and Waterman are correct, surely some of their findings about what makes an organization successful in the private sector also apply to the university. Certainly, the academic community shares a sense of "highly valued purpose" and history. Generally speaking, however, it is unclear whether the university organization is either willing to allow

or equipped to provide the flexibility in planning that this and coming decades will require. The values, attitudes and structures that are so much a part of the university organization seem to virtually ensure myriad problems for an administration or faculty bent on fostering change. Administrators are faced not only with the university's ambiguous organizational character, but an institutional inertia that makes change difficult even in the best of times. That these are not the best of times is evidenced by budget shortfalls and other problems that have forced the University of Washington, University of Colorado, and University of Northern Colorado, among others, to review their tenure policies and, at UNC, to fire 47 tenured faculty members.

Concluding Comment

Conflict is inherent within any organization and should be viewed as a potential source of ideas to be carefully considered. Those ideas and many other elements make up strategic decision-making, which admittedly may be little more than traditional planning with a formal title. Whether it really represents a "revolution" or not, strategic studies have forced more universities to consider and begin facing up to a changing world in which students and funding are no longer so plentiful. A selective growth strategy coupled with organization fluidity appear to offer institutions the best hope for coping with a changing environment. Within this environment, the university that holds to its fundamental goals and missions while adapting to change will stand the best chance of emerging with an enhanced program.

FOOTNOTES

[1] Carnegie Council on Policy Studies in Higher Education. Three Thousand Futures: The Next Twenty Years ofr Higher Education (San Francisco: Jossey-Bass Inc., Publishers, 1980), p. 30.

[2] Ibid, p. 34.

[3] Ibid.

[4] Information drawn from enrollment projection model by the Office of Institutional Research at Montana State University, April 1983.

[5] Lauren McKinsey, Perceptions of Science Research at Montana State University: A Component of the Montanans On a New Trac for Science (MONTS) Project (Bozeman, Mont.: Montana State University, October 1979), p. 28.

[6] Ibid.

[7] Ibid, pp. 35-36.

[8] Observations based on working for a daily newspaper in Nebraska, 1975-78, and periodic travel through the state.

[9] McKinsey, p. 2.

[10] Ibid, pp. 35-36.

[11] Richard I. Miller, The Assessment of College Performance (San Francisco: Jossey-Bass Inc., Publishers, 1979), p. 14.

[12] Ibid.

[13] Ibid.

[14] Ibid.

[15] McKinsey, p. 35.

[16] George Keller, "The View from Four Colleges," Change, March 1983, pp. 34-35.

[17] Carol Frances, "Apocalyptic vs. Strategic Planning," Change, July/August 1980, p. 19.

[18] Ibid.

[19] Ibid, p. 39.

[20] The Post-Land Grant University: The University of Maryland Report, by Malcolm Moos, Director (Adelphi, Maryland: The University of Maryland, 1981).

[21] John S. Toll, "Strategic Planning: An Increasing Priority for Colleges and Universities," Change, May/June 1982, p. 36.

[22] Ibid, p. 37.

[23] Three Thousand Futures, pp. 2-3.

[24] Ibid, pp. 4-5.

[25] Peter F. Drucker, The Changing World of the Executive (New York: Truman Talley Books, 1982), p. 100.

[26] Ibid, p. 111.

[27] "Getting Off the Tenure Track," Newsweek, 31 January 1983, p. 50.

[28] "'Hit list' Revealed for CSU," The Denver Post, 3 February 1983, p. 1-B.

[29] Ibid.

[30] "Auburn U. in Turmoil Over President," USA Today, 18 February 1983, p. 7-A.

[31] Drucker, p. 87.

[32] Thomas J. Peters and Robert H. Waterman, Jr., In Search of Excellence: Lessons from America's Best-Run Companies (New York: Harper and Row, Publishers, 1982), p. 51.

[33] Ibid.

Chapter 6

CONCLUSION: LOOKING BACK AND BEYOND

The selection and development of a survival strategy by institutions of higher education will play a large part in determining the roles they play through the remainder of the century. Some institutions will not survive, falling victim to shifts in enrollment and a changing world. Others will emerge with new mandates or missions, with some of the more desperate institutions catering to the whims of students and becoming essentially vocational schools. Still others will emerge with relatively strong programs, having selected certain areas of promise and accomplishment in which to devote some of their resources while continuing to fulfill their responsibilities as colleges and universities. There is no reason that Montana State University cannot be part of this last group, promoting areas of excellence and carrying out its threefold mission of teaching, research and public service.

One of the strongest things that MSU has going for it during this time of uncertainty is its land-grant values. These values of service to others through teaching, research and extension programs have served both the institution and state well, and should continue to do so for many more years. It is no small tribute to the land-grant institution that many other colleges and universities have adopted much of the land-grant mission and undertaken to provide similar services. The

land-grant institution can take great pride in having opened the doors of education to all qualified students and in championing the concept of applied research.

In charting its research program and future, MSU would be well-advised to follow Drucker's suggestion that an institution "has to be the right size for its market, its economy, and its technology; and the right size is whatever produces the optimal yield from productive resources."[1] Call it a strategic study, or just simple planning and evaluation, but MSU faculty members and administrators need to periodically step back and assess what is central to them and what aspirations are feasible for the university.

MSU must regularly address the questions of growth, of quality and of size. There must be a constant realization that size - measured solely in terms of research dollars, enrollment and buildings - is not the only measure of a university. A university exists to educate and graduate students who will contribute to society as citizens and leaders; to support intellectual and artistic creativity; to ensure educational justice; and "to provide ever more constructive evaluation for national self-renewal."[2]

A major part of planning is the development of goals and objectives that go beyond nebulous platitudes or diversionary tactics. Goal-forming is an appealing exercise in academia, where the temptation often is to delve into time-consuming details, failing to grasp the overall picture. At the other extreme exists a tendency to develop a set of goals so bland as to be acceptable to all and to be just as ineffective. Suffice it to say that goals can be reworked or altered to fit any number of perceived needs. MSU's traditional land-grant goals are so

broad as to be virtually all-encompassing. Within reason, a university working within those parameters can recommend almost any course of action and argue that it is meeting its mandate.

Yet regardless of MSU's internal plans and goals, students may well have the last say as to what kind of institution MSU and others will be in the 1980s and 1990s. In their book The Academic Revolution,[3] Christopher Jencks and David Riesman described how the values of research-oriented professors shaped the college and university world. In a recent followup to that book, Riesman notes that this faculty dominance has waned under the weight of a new student consumerism in which institutions court a dwindling number of students.[4] The students, who increasingly are career-oriented, are opting for programs in law, medicine and business, and rejecting the humanities. One conclusion is that students and faculty members will increasingly find themselves at odds over which programs and degrees will be offered. Administrators will undoubtedly find themselves caught between the two factions, torn between meeting the perceived needs of students, faculty members and the institution. In some cases, the issue could come down to choosing between institutional survival or remaining faithful to traditional academic values at the risk of closure. If the choice is between prostitution and closure, the institution can only opt for the latter out of respect for its values.

Fortunately, MSU is not faced with this kind of choice and has shown a strong willingness to remain in command of its programs of study and curriculum. MSU is facing enrollment pressures in business

and engineering. Nonetheless, within this consumer climate the university has recently adopted the general education curriculum model for, at least, the College of Letters and Science. That same balanced commitment needs to be maintained in the area of research, where any questionable offers that threaten the integrity of the professor and institution should be spurned. The university must guard against sacrificing its responsibility to conduct basic research in order to meet the more practical-oriented demands of the state and industry.

The path to an expanded research program is strewn with obstacles ranging from the university's geographical isolation to the state's reluctance to fund basic research. These problems are addressed in the MONTS report with a number of sound suggestions offered by its author. MSU also is confronted with an increasingly competitive environment in which not only the traditional research universities, but middle-tier institutions are aggressively pursuing more research grants and contracts. While the major research universities remain as powerful as ever, other institutions are improving their programs by bringing in young, talented professors who have been forced by market conditions to consider working for institutions that they would have ignored in the past. MSU could find itself in the position of having to improve its research efforts to simply stand its ground, let alone striving to surge ahead.

MSU administrators maintain that their approach to strengthen research ought not to be considered as a conscious survival strategy as the term is used in this paper. Certainly, it would be extremely risky

for MSU to base its strategic planning on an expanded research program that would be expected to attract increasing amounts of monies. Beyond the constraints that MSU faces in building its research program, it seems virtually certain that enrollment will remain the key element in funding for MSU as well as most of the nation's colleges and universities. Michael Cohen and James March estimate that only one percent of the colleges and universities depend on institutional and research reputations - not enrollment - to develop their budgets. Mostly these are the prestigious private universities that rank among the nation's leading institutions. A third category encompasses those major public universities and some private institutions which rely on both the enrollment cycle and research reputation for funding, a strategy MSU administrators are weighing heavily. The last budgeting type is the prestigious, small (often liberal arts) college that depends on enrollment and on institutional support and endowment.[5]

One of the keys to MSU's continuing health and prosperity is enrollment, which should remain comparatively strong with possibly a leveling off at around 10,500 to 10,700 by the end of the decade. A "steady state" enrollment would provide MSU officials the opportunity to plan their budgets without having to cope with the heavy increases of enrollment of recent years. Officials might want to consider ways of changing state laws to revise admissions standards in order to reduce the large freshmen classes that have drained university resources. Such a policy would divert some students to other state institutions, improving their slumping enrollments. Many of those students who

attended other institutions could enroll at MSU their junior year, arriving more mature and prepared to undertake college-level work. While I have stressed throughout this paper the importance of serving students, the institution also has a responsiblity to itself to ensure that the quality of its program steadily improves. This is difficult to accomplish when the institution is burdened with large numbers of students at the freshman and sophomore levels.

With enrollment holding steady, administrators would have additional time to concentrate on designs to selectively expand and upgrade the research program. Research is a healthy and productive responsibility for a university to assume. The concern is that by striving to enhance its research program, MSU could wind up doing so at the expense of all levels of instruction and public service. In an era of fiscal restraint, it is probably impossible to emphasize one land-grant mission without upsetting the balance among all three missions. As Clark Kerr notes, there seems to be a "point of no return" after which research becomes so absorbing that faculty members can no longer concentrate their attention on undergraduate instruction.[6]

Another potential key to MSU's ability to avoid painful retrenchment is its hierarchical system of management, which can allow the university to move more swiftly than is often possible at collegial institutions. Administrative moves are less likely to be challenged by the faculty at MSU, where professors are generally more conservative by nature and willing to grant the administration greater responsibility. Too, the relationship seems to work as faculty members have enjoyed job security and, in many cases, drawn at least adequate research

funding. Faculty members have maintained a generally high standard of teaching and performed research of a quality ranging from satisfactory to exemplary.

While MSU's hierarchical system allows the university to forge ahead when other institutions might still be debating the issue, it is reasonable to question how much input faculty members had in the administrative decision to place more emphasis on research and the reasons for doing so. The administration does not appear to have the full support of all professors in this endeavor but, it can be argued, few moves of any scale or consequence ever do. Much of the faculty appears to welcome some sort of increased emphasis on research within reason and with pursuant rewards. The situation could become more competitive than many expect, however, if faculty members are virtually forced to compete for monies and time to carry out the increased workload they are now expected to assume.

The administration needs to ensure that it maintains a dialogue with faculty members and provides for their participation in the formulation of policy. That policy-making should be undertaken with the firm conviction that MSU performs a valuable role in the state through its missions of teaching, research and public service. These missions have evolved over the years and will continue to do so for the foreseeable future. It must be realized that just as the American farm family, which once epitomized life here, has changed with the times, so must the land-grant university continue to adapt while remaining faithful to its roots. Those roots, I am convinced, are deep enough to allow Montana State University to pursue new directions while taking care to maintain its institutional integrity.

FOOTNOTES

[1] Peter F. Drucker, The Changing World of the Executive (New York: Truman Talley Books, 1982), p. 87.

[2] Carnegie Council on Policy Studies in Higher Education, Three Thousand Futures: The Next Twenty Years for Higher Education (San Francisco: Jossey-Bass Inc., Publishers, 1980), p. 94.

[3] Christopher Jencks and David Riesman, The Academic Revolution (New York: Doubleday, 1968).

[4] David Riesman, On Higher Education: The Academic Enterprise in an Era of Rising Student Consumerism (San Francisco: Jossey-Bass Inc. Publishers, 1980).

[5] Michael D. Cohen and James G. March, Leadership and Ambiguity (New York: McGraw-Hill Book Co., 1974), p. 101.

[6] Clark Kerr, The Uses of the University (Cambridge, Mass.: Harvard University Press, 1964), p. 65.

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