

## Public Research Universities

### Outline

- Preamble
- What is the public research university?
- What are our challenges.
- Biggest challenge...
  - The challenge of change...

### Introduction

Perhaps the unique characteristic of higher education in America is the strong bond between the university and society. Historically our institutions have been shaped by, have drawn their agendas from, and have been responsible to the communities that founded them.

This unique partnership goes back over two centuries to that famous passage from the Northwest Ordinance, "Religion, morality, and knowledge being necessary to good government and the happiness of mankind, schools and the means of education shall forever be encouraged."

This laid the foundation for one of our nation's most remarkable social inventions, the American research university.

Because they added the activities of research and service to the traditional academic mission of teaching the young, these institutions created a continuing connection between theory and practice.

The result has been a powerfully creative engine for progress.

The American research university, through on-campus scholarship and off-campus extension activities, was first key to the agricultural development of America and then to the transition to an industrial society. WW II provided the incentive for even greater cooperation as the universities became important partners in the war effort, achieving scientific breakthroughs such as nuclear fission and radar.

The seminal report, *Science, the Endless Frontier*, produced by a post-war

study group chaired by Vannevar Bush, stressed the importance of this partnership by echoing the spirit of the Northwest Ordinance: "Since health, well-being, and security are proper concerns of government, scientific progress is, and must be, of vital interest to government."

The resulting partnership between the federal government and

the nation's universities has had an extraordinary impact. It has made America the world's leading source of fundamental scientific knowledge. It has also produced the well-trained scientists and engineers capable of applying this new knowledge.

Yet as important as research universities are today in our everyday lives, it seems increasingly clear that in the future they will play an even more critical role as they become the key players in providing the knowledge resources--knowledge itself and the educated citizens capable of applying it wisely--necessary for our prosperity, security, and social well-being.

As Erich Bloch, former Director of the National Science Foundation stated it

in Congressional testimony:

"The solution of virtually all the problems with which government is concerned: health, education, environment, energy, urban development, international relationships, space, economic competitiveness, and defense and national security, all depend on creating new knowledge--and hence upon the health of America's research universities."

## **Challenges**

The Good News...and the Bad News

The good news is that America's system of higher education is still widely acknowledged to be the strongest and most productive in the world. A couple of years ago a New York Times editorial referred to our nation's research universities as the "jewel in the crown" of our national economy. It went on to assert that university research "is the best investment taxpayers can ever make in America's future".

If the good news is that our research universities are the strongest in the world--at a time when the benefits from R&D investment have never been higher--the bad news is that the 1990s stand a good chance of being the worst for higher education since the 1930s. There is a frightening sense of crisis at many of our nation's most distinguished campuses.

Our universities are at serious risk on a number of fronts.

The signs of stress are everywhere:

1. The breakdown of mutual trust has led to increasingly adversarial relationships between universities and government, including Congress, the administration, and federal agencies, as manifested in recent skirmishes over matters such as indirect cost reimbursement, scientific misconduct, and pressures to restrict the flow of technical information.
2. The skepticism--indeed, hostility--exhibited by the media and government has badly eroded public trust and confidence in the university, as revealed by the recent deluge of attacks on the academy, e.g., those who suggest that "most scholarly activity is either the sterile product of requirements imposed by Philistine administrators or a form of private pleasure that selfish professors enjoy at the expense of their students."
3. Forces upon and within the universities, such as the rapidly escalating costs of research, are pushing toward a rebalancing of missions, away from research and more toward teaching and public service.
4. The morale of academic researchers has deteriorated significantly over the past decade, in part due to the pressures and time-consuming nature of the need to obtain and manage sponsored research funding and the disintegration of a "scholarly community" within the university. In a recent series of campus workshops sponsored jointly by the Government-University-Industry Research Roundtable and the National Science Foundation, a young faculty member described the modern university as "a holding company for research entrepreneurs."□

What is going on here? To some degree, we may be seeing evidence of the increasing estrangement of the American public--and their elected representatives--from science itself. The gap grows even wider between the omnipresent influence of science on modern society and the scientific literacy of the body politic.

We also may be experiencing the same forces of populism that rise from time to time to challenge many other aspects of our society--a widespread distrust of expertise, excellence, and privilege (the Forrest Gump syndrome). Unfortunately, many scientists, universities, and university administrators have made themselves easy targets by their arrogance and elitism.

But something else may be happening. Let me comment on several aspects of the current stresses on the academic research enterprise that may prove of critical importance in the years ahead.

#### The Political Economic Crisis

Universities are suffering the consequences of the structural flaws of national and state economies, the growing imbalance between

revenues and expenditures, that are undermining support for essential institutions as governments struggle to meet short-term demands at the expense of long-term needs. For too long the electorate has had the credo: "Eat dessert first. Life is uncertain. And by the way, just send the bill to the kids later--say in a decade or two." The fact is that education at all levels is feeling the effects of two decades of political failure to invest in our people and infrastructure--in our children's future.

Actually, the writing has been on the wall for almost a decade, since federal outlays for R&D have been falling in real terms since 1987. Today, in Washington, this slogan has been replaced by a new mantra, "Balance the Budget by the year 2000", that is being chanted over and over again as the way to deliverance. While the particular Tao, the path to deliverance, is still uncertain...whether via the Contract with America or Reinventing Government...the endpoint is clear. Discretionary domestic spending, research and education programs, and federal support of the research university, all are at great risk. (For example, basic research is proposed to decline by 30%, with even the National Science Foundation being cut up to 13% (\$440 M).) Indeed, leaders both in the federal government as well as in higher education have suggested that the next several months could well determine whether the research university will survive into the next century as a viable paradigm in American higher education.

The states are also in serious trouble. Cost shifting from the federal government through unfunded mandates such as Medicare, ADA, and OSHA, the commitment many states have made to funding K-12 education off-the-top, and massive investments in corrections have undermined their capacity to support higher education. In fact, in many states today, the appropriations for prisons has now surpassed the funding for higher education and shows no signs of slowing. Few, indeed, are those public universities that can expect even inflationary increases in state appropriations in the decade ahead.

Yet there is a certain irony here. During that same period, state support of our prison system has exploded and will pass the total dollars invested in higher education in the next year or so. David Adamany notes that 10 years ago we had 15 public universities and 8 prisons. Today we still have 15 universities...but 35 prisons. More to the point, this year the state will spend \$1.4 billion for the education of 250,000 college students, and

essentially the same amount (\$1.4 billion) for the incarceration of 40,000 inmates.

As a result, many public and private institutions are facing very serious financial difficulties today. While you read in the national press about the staggering budget deficits faced by relatively affluent institutions like Stanford, Yale, and the University of California, the situation is far more serious in those institutions that do not benefit from massive endowments or generous state support.

There is an additional challenge faced by the best of America's universities. Harold Shapiro, President of Princeton University, has identified what he calls the "1 percent problem" facing those institutions that compete to be the very best in teaching and scholarship. The decade of the 1980s experienced a trend in which the costs of achieving excellence in higher education rose roughly 1 percent per year more rapidly than the available resource base. (Some institutions such as Stanford found this mismatch to be 2 percent or higher.) Most studies project that this trend is likely to continue throughout the 1990s, driven in part by the expanding knowledge base and by the cost structures of quality research and teaching. While a given institution may be able to accommodate such an imbalance between costs and revenues over a short period, it is clear that over the long term, the "1 percent problem" will require a significant restructuring of the mission and activities of the university. □

#### The Inability to Comprehend the Modern University

There is another dilemma here, one perhaps best illustrated by the old parable of the blind men each feeling different parts of an elephant and arguing over just what the whole beast looks like. The modern research university is complex and multidimensional. People perceive it in vastly different ways, depending on their vantage point, their needs, and their expectations. Students and parents want high-quality, but low-cost, education. Business and industry seek high-quality products: graduates, research, and services. Patients of our hospitals seek high-quality and compassionate care. Federal, state, and local governments have complex and varied demands that both sustain and constrain us. And the public itself sometimes seems to have a love-hate relationship with higher education. They take pride in our quality, revel in our athletic accomplishments, but they also harbor deep suspicions about our costs, our integrity, and even our intellectual aspirations and commitments.

Beyond the classic triad of teaching, research, and service, society has assigned to the University over the past several decades an array of other roles:

- improving health care
- national security
- social mobility
- parenting
- big-time show biz (intercollegiate athletics)

It is now asking to us to assume additional roles such as:

- revitalizing K-12 education
- improving race relations in America
- rebuilding our cities
- securing economic competitiveness

Unfortunately, most people--and most components of state and federal government--can picture the university "elephant" only in terms of the part they can feel, e.g., research procurement, student financial aid, and political correctness. Few seem to see, understand, or appreciate the entirety of the university.

This is particularly true in Washington, where each element of the federal government attempts to optimize the procurement of the particular products or services they seek from our research universities. There seems to be little recognition that shifting federal priorities, policies, or support aimed at one objective will inevitably have an impact on other roles of our institutions.

Looking at the university from an economist's perspective, one would see as inputs our people--students, faculty, and staff--and our funding--tuition paid by students and families, gifts and income on endowments, and taxpayer dollars from state and federal governments. Our outputs are the value-added through the education of our students, the knowledge produced on our campuses, and through direct services to our society such as through agricultural extension services or teaching hospitals.

The problem is simple: Each stakeholder wants to minimize the input it provides and maximize the output it obtains from universities, but none of the funding contributors is looking at

the university as a whole, with diverse missions. More specifically, each party seems to want much more out than it is willing to put in, thereby leveraging other contributors.□

#### The Real Issue: Shifting Paradigms

Let me suggest that beyond the financial pressures, the cost-shifting trends, human resource concerns, and the difficulties in comprehending and balancing the many missions of the university, there is yet another important theme that we must consider, and that is change itself. Today we find ourselves in the midst of two simultaneous paradigm shifts: i) in the nature of the government-university research partnership and ii) in the character of the university itself. These shifts are being driven by the extraordinary nature and pace of change in the world today.

#### A Shift in National Priorities: From Guns to Butter...

For almost half a century, the driving force behind many of the major investments in our national infrastructure has been the concern for national security in the era of the Cold War. The evolution of the research university, the national laboratories, the interstate highway system, our telecommunications systems and airports, the space program, all were stimulated by concerns about the arms race and competing with the Communist Bloc. So too, much of the technology that we take for granted, from semiconductors to jet aircraft, from computers to composite materials, all were spin-offs of the defense industry.

Yet in the wake of the extraordinary events of the last five years--the disintegration of the Soviet Union and Eastern Europe, the reunification of Germany, and the major steps toward peace in the Middle East--the driving force of national security has disappeared, and along with it, much of the motivation for major public investment. Far from a "peace dividend" providing new resources in a post-Cold War world for investment in key areas such as education and research, instead the nation is drifting in search of new driving imperatives. While there are numerous societal concerns such as economic competitiveness, national health care, crime, and K-12 education, none of these has yet assumed an urgency sufficient to set new priorities for public investments.

Further, much of the existing intellectual infrastructure, developed to underpin national defense, is now at risk. The national laboratories are facing massive downsizing and necessarily searching for new missions. The burdens of the massive debts incurred in the buyout-merger mania of the late

1980s have forced corporate America to downsize research and development activities, including the shift of many of America's leading corporate research laboratories such as the Bell Laboratories and the IBM Research Laboratories from long-term research to short-term product development.

Equally serious are signs that the nation is no longer willing to invest in research performed by universities, at least at the same level and with a similar willingness to support understanding-driven basic research. Congress has made it clear that they will insist that universities focus increasingly on applied research, more directly related to national priorities (although many industrial leaders have tried in vain to explain that without "basic" research, there is nothing to "apply"). The federal government has yet to develop an successor to the government-university research partnership which served so well during the Cold War years.

Of course, it is certainly appropriate to seek to support "strategic" research, that is, both basic and applied research that has a high probability of contributing to national goals. And it is also the case that universities have responded to such national priorities in years past, ranging from national security to health care to agricultural or industrial development. Indeed, many of our land-grant public universities have such strategic research as an important part of their mission.

Hence the concern is not the renewed federal interest in strategic research, but rather the way that the federal government is approaching this effort. The American research enterprise triad, research universities, national laboratories, and industrial research laboratories, is generally approached through the institutional structure of Congress, where most committees and therefore budget decisions are organized around specific mission-oriented agencies (e.g., defense, energy, health, environment). While it certainly makes sense to attempt to redirect the entire American research enterprise to focus on new strategic objectives, to do so within a single committee or budget category could lead to a damaging distortion of our research capacity. □

#### A Change from Partnership to Procurement

As we have already noted, the basic structure of the academic research enterprise of the past half century was set out in Bush's study, *Science, the Endless Frontier*, almost fifty years ago. The

central theme of the document was that the nation's health, economy, and military security required continual deployment of new scientific knowledge and that the federal government was obligated to ensure basic scientific progress and the production of trained personnel in the national interest. It insisted that federal patronage was essential for the advancement of knowledge. It stressed a corollary principle--that the government had to preserve "freedom of inquiry," to recognize that scientific progress results from the "free play of free intellects, working on subjects of their own choice, in the manner dictated by their curiosity for explanation of the unknown."

Since--at least in the past--the government recognized that it did not have the capacity to manage effectively either the research itself or the universities, the relationship was essentially a partnership, in which the government provided relatively unrestricted grants to support a part of the research on campus, with the hope that "wonderful things would happen." And they did, as evidenced by the quality and impact of academic research.

Unfortunately, in recent years the basic principles of this extraordinarily productive research partnership have begun to unravel, so much so that today this relationship is rapidly changing from a partnership to a procurement process. The government is increasingly shifting from being a partner with the university--a patron of basic research--to becoming a procurer of research, just like other goods and services. In a similar fashion, the university is shifting to the status of a contractor, regarded no differently from other government contractors in the private sector. In a sense, today a grant has become viewed as a contract, subject to all of the regulation, oversight, and accountability of other federal contracts. This view has unleashed on the research university an army of government staff, accountants, and lawyers all claiming as their mission that of making certain that the university meets every detail of its agreements with the government.

To be sure, we must all be concerned about the proper expenditure of public funds. But we also must be concerned about restoring the mutual trust and confidence of a partnership and move away from the adversarial contractor/procurer relationship that we find today.

Unfortunately, even the procurement model may be only a transitional stage, since in recent months there have been signs

that the paradigm is continuing to shift still further to the same cost-control--or more correctly, federal cost-shifting--patterns characterizing health care. Can you imagine a system of DRG cost-reimbursement rules for basic research?

Surely the most ominous warning signs for academic research are the erosion, even breakdown, in the extraordinarily productive fifty-year partnership uniting government and universities. Scientists and universities are questioning whether they can depend on the stable and solid relationship they had come to trust and that has paid such enormous dividends in initiative, innovation, and creativity. It is truly perverse that the partnership that has been in large measure responsible for our long undisputed national prosperity and security should be threatened at very moment when it has become most critical for our future. □

Note: If the feds are going to procure knowledge services, then the concept of cost-sharing is no longer relevant. Procurement means paying all the costs, folks...

### The Changing Paradigm of the Research University

There is an even more profound transformation occurring: that involving the paradigm of the research university itself. As one of civilization's most enduring institutions, the university has been extraordinary in its capacity to change and adapt to serve society. Far from being immutable, the university has changed over time and continues to do so today. A simple glance at the remarkable diversity of institutions comprising higher education in America demonstrates this evolution of the species.

The challenges and changes facing higher education in the 1990s are comparable in significance to two other periods of great change for American higher education: the period in the late-nineteenth century, when the comprehensive public university first appeared, and the years following World War II, when the research university evolved to serve the needs of postwar America. Today, many are concerned about the rapidly increasing costs of quality education and research during a period of limited resources, the erosion of public trust and confidence in higher education, and the deterioration in the partnership between the research university and the federal government. However, our institutions will be affected even more profoundly by the powerful changes driving transformations in our society, including the increasing ethnic and cultural diversity of our people; the growing interdependence of nations;

and the degree to which knowledge itself has become the key driving force in determining economic prosperity, national security, and social well-being.

One frequently hears the primary missions of the university referred to in terms of teaching, research, and service. But these roles can also be regarded as simply the twentieth century manifestations of the more fundamental roles of creating, preserving, integrating, transmitting, and applying knowledge. From this more abstract viewpoint, it is clear that while these fundamental roles of the university do not change over time, the particular realization of these roles do change--and change quite dramatically, in fact. Consider, for example, the role of "teaching," that is, transmitting knowledge. While we generally think of this role in terms of a professor teaching a class of students, who, in turn, respond by reading assigned texts, writing papers, solving problems or performing experiments, and taking examinations, we should also recognize that classroom instruction is a relatively recent form of pedagogy. Throughout the last millennium, the more common form of learning was through apprenticeship. Both the neophyte scholar and craftsman learned by working as apprentices to a master. While this type of one-on-one learning still occurs today, in skilled professions such as medicine and in advanced education programs such as the Ph.D. dissertation, it is simply too labor-intensive for the mass educational needs of modern society.

The classroom itself may soon be replaced by more appropriate and efficient learning experiences. Indeed, such a paradigm shift may be forced upon the faculty by the students themselves. Today's students are members of the "digital" generation. They have spent their early lives surrounded by robust, visual, electronic media--Sesame Street, MTV, home computers, video games, cyberspace networks, and virtual reality. They approach learning as a "plug-and-play" experience, unaccustomed and unwilling to learn sequentially--to read the manual--and rather inclined to plunge in and learn through participation and experimentation. While this type of learning is far different from the sequential, pyramid approach of the traditional university curriculum, it may be far more effective for this generation, particularly when provided through a media-rich environment.

Hence, it could well be that faculty members of the twentieth-first century university will be asked to set aside their roles as teachers and instead become designers of learning experiences, processes, and environments. Further, tomorrow's

faculty may have to discard the present style of solitary learning experiences, in which students tend to learn primarily on their own through reading, writing, and problem solving. Instead they may be asked to develop collective learning experiences in which students work together and learn together with the faculty member becoming more of a consultant or a coach than a teacher.

One can easily identify other similarly profound changes occurring in the other roles of the university. The process of creating new knowledge--of research and scholarship--is also evolving rapidly away from the solitary scholar to teams of scholars, perhaps spread over a number of disciplines. Indeed, is the concept of the disciplinary specialist really necessary--or even relevant--in a future in which the most interesting and significant problems will require "big think" rather than "small think"? Who needs such specialists when intelligent software agents will soon be available to roam far and wide through robust networks containing the knowledge of the world, instantly and effortlessly extracting whatever a person wishes to know?

So, too, there is increasing pressure to draw research topics more directly from worldly experience rather than predominantly from the curiosity of scholars. Even the nature of knowledge creation is shifting somewhat away from the analysis of what has been to the creation of what has never been--drawing more on the experience of the artist than upon analytical skills of the scientist.

The preservation of knowledge is one of the most rapidly changing functions of the university. The computer--or more precisely, the "digital convergence" of various media from print to graphics to sound to sensory experiences through virtual reality--has already moved beyond the printing press in its impact on knowledge. Throughout the centuries the intellectual focal point of the university has been its library, its collection of written works preserving the knowledge of civilization. Yet today, such knowledge exists in many forms--as text, graphics, sound, algorithms, virtual reality simulations--and it exists almost literally in the ether, distributed in digital representations over worldwide networks, accessible by anyone, and certainly not the prerogative of the privileged few in academe.

Finally, it is also clear that societal needs will continue to dictate great changes in the applications of knowledge it excepts from universities. Over the past several decades,

universities have been asked to play the lead in applying knowledge across a wide array of activities, from providing health care, to protecting the environment, from rebuilding our cities to entertaining the public at large (although it is sometimes hard to understand how intercollegiate athletics represents knowledge application).

This abstract definition of the roles of the university have existed throughout the long history of the university and will certainly continue to exist as long as these remarkable social institutions survive. But the particular realization of the fundamental roles of knowledge creation, preservation, integration, transmission, and application will continue to change in profound ways, as they have so often in the past. And hence, the challenge of change, of transformation, is, in part, a necessity simply to sustain our traditional roles in society.

There is an increasing sense among leaders of American higher education and on the part of our various constituencies that the 1990s will represent a period of significant change on the part of our universities if we are to respond to the challenges, opportunities, and responsibilities before us. A key element will be efforts to provide universities with the capacity to transform themselves into entirely new paradigms that are better able to serve a rapidly changing society and a profoundly changed world. □

### **What is the modern research university?**

What are we?

Public, student, faculty views

Very few people, on our campus or off, know what the modern research university has become.

The public thinks of us in a very traditional way, with an image of students sitting in a large classroom listening to some dottering faculty

member lecturing from yellowed notes on Shakespeare.

It is almost a high school image of the university.

The faculty think of ourselves as Oxbridge, themselves as dons and

their students as serious scholars.

The federal government thinks of us as just another R&D contractor or

health provider, a supplicant for the public purse.

Multiple Missions

The reality is something quite different, as a brief analysis of our mission will indicate.

While our missions all derive from the classic triad of teaching, research,

and service, the various forms these general missions branch into stretch on and on.

Give some examples here:

Education: Who?

UG, Grad, Prof

Oncampus, Extension, Cont Ed, Nontrad

Education

UG

HS grads, Transfer students, non trad

Michigan res, U.S., world, alumni kids

Grad

College grads, Phds

Professional

College grads, postbacc

Postdoctoral, faculty

Continuing ed

Certification, retooling, exec ed, lifetmiem ed, sports camps

K-12, preschool

“Parenting adolescents” (“Transforming savages into gentlemen”)

Additional Education Missions

Alumni: lifelong learning and enrichment

Faculty, administrators as students

Public service education (a la Kennedy School)

Study abroad, overseas campuses

International students

Cooperative education

Research: What Kind?

Basic, Applied, Testing

Social, Health, Defense, Space

Intellectual Products

Research

Creative activities: performing arts, fine arts

Policy development: thinktanks, policy institutes

Testing: clinical trials

Preserving and transmitting civilization

Entrepreneurial activities: startups, spinoffs

Teaching and learning

Service: To Whom

University, state, nation, world

Knowledge, health care, tech trans, econ dev

Service:

Health Care: Hospitals, health education, networking  
Economic development: tech trans, attract comp, spending  
Entertainment: Athletics, cultural, campus nonsense  
Public Service: Community, state, nation, world  
Triggering Social change: racial justice, poverty, Earth Day  
Student services: Housing, feeding, counseling, career plan  
Campus comm: parking, safety, transportation, childcare  
Alumni: Travel bureau (UM AA), networking, reunions  
Public Info: Pub, broadcasting, media rel, pub rel, library serv  
Major strategic issues  
    (state): K-12, Bus, Pub Pol, Flint, Detroit  
    (nation): K-12, defense, environ, energy networking  
    (world): global change, int dev, int rel  
    (cosmic): Is universe lumpy? Is Santa a Dem; God a Rep

## Reality

Let me suggest a different image of the modern research university:  
    that of a very complex, international conglomerate of highly diverse businesses. Consider, for example, an organizational diagram of "the U of M, Inc":  
The U of M Inc., with an annual budget of over \$2.7 billion per year, would rank roughly 200th on the Fortune 500 list.  
We have several campuses where we educate about 50,000 students at any one time, about an \$1.2 B dollar a year operation.  
We're a very major federal R&D laboratory, over \$400 million dollars a year worth of grants and contracts.  
We run a massive health care company.  
Our medical center treated over 800,000 patients last year. We have a managed care operation with 70,000 "managed lives".  
In December we will form a nonprofit corporation, the Michigan Health Corporation, which will allow us to make equity investments

in joint ventures to build a statewide integrated health care system

building to roughly 1,500,000 subscribers, which is the size of a

population we believe necessary to keep our tertiary hospitals afloat (which unfortunately we own).

We're already too big to buy insurance, so we have our own captive

insurance company (\$200 M)

We've become actively involved in providing a wide array of knowledge

services, from degree programs offered in Hong Kong, Seoul, and

Paris, cyberspace-based products such as managing part of the

Internet.

And of course, we're involved in entertainment--the Michigan Wolverines.

That \$250 million million you see under the Michigan Wolverines is

not our athletic budget--thank God--but when you represent licensing and everything else we do, that's about the magnitude of

it.

In fact, last week we became the first university to sign a university wide shoe contract, with NIKE in an effort to pull in all of

our various coaches contracts. Perhaps we should change our

school slogan from GO BLUE, to JUST DO IT.

This "corporate" organization chart would be quite similar for many of

the large research universities across the nation.

What are we?

We have all become conglomerates because of the interests and efforts

of our faculty.

We're all prime examples of "loosely coupled, adaptive systems" that

grow in complexity as their various components respond to

changes in environment, with each of those components pursuing

its own particular goals.

We are a learning organization, to use the business term.

Beyond that we're also a holding company for thousands

of faculty entrepreneurs.

One of my colleagues referred to leading a large university

as akin to pushing a wheelbarrow full of frogs...

...if you push too fast, they tend to hop out on you...

This character has given us a very resilient capacity to respond to change.

We've evolved over the years, driven by the creativity, efforts, and

energy of individual faculty and those units they identify with, to

excel, and by a transactional culture, in which everything is up for negotiation.

It is "let's make a deal", writ large.

And this character and this culture has lead to the U. of M. Inc.

UM: a loosely-coupled, adaptive system of growing complexity as it responds to a changing environment  
... a learning organization  
... a holding company of 3,000 entrepreneurs...



The U of M, Inc.

- On-campus education
- Research
- Health Care
- HMOs
- Extension Services
- Veritas
- Entertainment ("M")
- ...

Natural evolution characterized by  
...a transactional culture  
...decentralization with optimization at level of individual units  
...little attention to core mission or fundamental values

Concerns with U of M, Inc.  
...dilution of "core businesses"  
...so complex that few understand UM  
...unable to eliminate outmoded and obsolete activities  
...our best people are hindered by outdated policies, procedures, practices

## Challenges

Indeed, part of our challenge is simply to understand the nature of the contemporary comprehensive university

and the forces which currently drive its evolution.  
In many ways, the university today is like a corporate conglomerate, comprised of many business lines, some nonprofit, some publicly regulated, and some operating in intensely competitive marketplaces.  
We teach students; we conduct R&D for various clients; we provide health care; we engage in economic development; and we provide mass entertainment (...athletics...).

In systems terminology, the modern university is a loosely-coupled, adaptive system, with a growing complexity as its various components respond to changes in its environment.

In a very real sense, the university of today is a holding company of faculty entrepreneurs, who drive the evolution of the university to fulfill their individual goals. Many would contend that we have diluted our core businesses, particularly undergraduate education, with a host of entrepreneurial activities.

We have become so complex that few--including our own faculty--understand what we have become. And today, unlike much of the recent past, we face serious constraints on resources which will no longer allow us to be all things to all people.

And we have become sufficiently encumbered with processes, policies, procedures, and practices of the past that our very best and creative people no longer determine the direction of our institution.

To respond to the challenges and opportunities of the future, the modern university must engage in a far more strategic process of change.

While the natural evolution of a learning organization may still be the best model of change, it must be augmented by constraints to preserve our fundamental values and mission.

And we must find ways to free our most creative people to enable them to drive the future of our institutions.

### **What to do?**

There is an increasing sense among leaders of American higher education and on the part of our various constituencies that the 1990s will represent a period of significant change on the part of our universities if we are to respond to the challenges, opportunities, and responsibilities

before us.

A key element will be efforts to provide universities with the capacity to transform themselves into entirely new paradigms that are better able to

serve a rapidly changing society and a profoundly changed world

We must seek to remove the constraints that prevent our institutions from

responding to the needs of a rapidly changing society, to remove unnecessary processes and administrative structures, to question existing premises and arrangements, and to challenge, excite, and embolden the members of our university communities to embark on this great adventure.

Our challenge is to work together to provide an environment in which such change is regarded not as threatening but rather as an exhilarating opportunity to engage in the primary activity of a university, learning, in all its many forms, to better serve our world.

In summary, our objective for the next several years is to provide our universities with the capacity to transform themselves into institutions more capable of serving our states, our nation, and the world.

As I said at the outset, the remarkable resilience of institutions of higher education, the capacity to adapt to change in the past has occurred because in many ways they are intensely entrepreneurial, transactional cultures..

We have provided our faculty the freedom, the encouragement and the incentives, to move toward their personal goals in highly flexible ways, and they have done so through good times and bad. Unfortunately their efforts have all too frequently today led to organizations that have become far comprehensive, complex, and detached from their core mission of learning.

Our challenge is to tap this great source of creativity and energy associated with entrepreneurial activity, but in a way that preserves our fundamental mission our fundamental values.

In a sense we need to continue to encourage our tradition of natural evolution so successful in responding to a changing world, but to do so with greater strategic intent.

That is, rather than continuing to evolve as an unconstrained transactional entrepreneurial culture, we need to guide this process in such a way as to preserve our core missions, characteristics, and values.

Furthermore, we must develop greater capacity to redirect our resources toward our highest priorities.

While we are facing a period of more constrained resources,

I believe that most of our institutions will continue to grow. After all, the knowledge business is a "growth industry". Yet, to use a gardening analogy, we need to develop the capacity to prune and shape this growth so that it is more strategic. In summary, I share the sense and among most of my colleagues as presidents of universities that the 1990s will see extraordinary changes in the nature of higher education and the nature of our institutions.

A key element will be to provide ourselves with the flexibility, the capacity to change, to serve a changing society.

But to change in such a way that we preserve fundamental aspects of our characters and our values.

Our challenges as institutions, as complex communities will be to learn how to work together to provide environments in which such change is regarded not as threatening, but rather as an exhilarating opportunity to engage in the primary activity of the university which of course, is learning.

This capacity for change, for renewal I think is the key objective that we have to strive for in the years ahead.

A capacity that will allow us to transform ourselves once again as the university has done so many times in the past to become a structure, an institution capable of serving a changing society and a changing world.

Unconstrained evolution

Growth, complexity, adaptivity

Serving marketplace

But becoming less and less "a university"

(...a place for learning...)

and more and more a business

Back to basics

Mission shedding

The first question concerns focusing and refining our activities to bring them more in line with our core mission of learning.

It seems clear that we need to learn the art of "mission shedding".

That is, we have to develop the capacity to shed some of the missions that we've taken on through the interest of our faculty in the past. Let me use an example.

Like many institutions with large academic health centers, at Michigan we are building what will be a multi-billion dollar health care system.

Do we really need this size of operation to support our teaching and research mission? Of course not.

But we do need a health care system this large to provide sufficient referrals to keep our massive tertiary and quaternary care hospitals afloat.

Here we have an example of a mission that has probably outgrown our institution and needs to be spun off.

#### Focusing

That's right and we've made plenty of mistakes--although we usually don't let the papers get word of this up to East Lansing.

I think we made some big mistakes during the early 1980's when we tried to put into place a very public mechanism capable of discontinuing academic programs.

Actually at that time we tried to discontinue three schools, number of subprograms and at the end, didn't really discontinue anything.

We did cut them down at the cost of great trauma.

But we learned that a public lynching in the town square just did not work.

We're now trying to learn how to prune in different ways.

What we're learning is that, at least in a highly public institution governed by strong sunshine laws, we really have to accomplish the pruning by finesse, by reorganizing units and hoping that in the process of units just disappear.

This sounds somewhat Machiavellian but that may be the only way to do it.

For example, we've just gone through a process of eliminating for

the second time our Population Planning Department.

It was eliminated during the late 1970's, but it grew back in the 1980s.

When we tried to eliminate it again using a public process, we found that we just couldn't do it.

So what we finally ended up doing is re-structuring the parent body,

our school of Public Health by re-organizing it from eight departments into four departments.

In the process, we magically lost population planning, but in an acceptable fashion. So I suppose sleight of hand may be a good approach.

But I... don't look at Michigan as a good model for such efforts.

I understand that UCLA is going through a similar pruning process

again using re-organization as the mechanism to restructure and eliminate.

#### Clearing out the underbrush

Part of the challenge is to clear the underbrush cluttering our institutions.

Like your institutions, we have a thicket of policies and

procedures and practices, along with the anarchy of committee and consensus decision making--which is an oxymoron in itself.

Committees don't make decisions.

Our best people now feel quite constrained by the University as it is currently defined, constrained by their colleagues, constrained by the "administration", but beyond that, even as we remove those constraints, there have to be some mechanisms in place to guide the institution in a strategic way.

That will be done in different ways by different institutions. In our institution, our Provost is leading the difficult process of moving us to responsibility center management.

We've had a highly decentralized institution for many years which has been operated according to centralized fund-accounting.

There have been few direct incentives to generate incentives or control costs at the unit level.

We hope that responsibility center management will accomplish three things: It provides very strong incentives for the units to generate resources. It provides strong incentives to use those resources wisely. And because it will provide significant resources under central control, much of which will return as conscious subsidies, it will give us much more capacity to guide the institution. It strengthens the tiller a bit. We may be somewhat unique in that because we are already highly decentralized in management right now.

To move strategically, we're may to have to centralize a bit more control over resources.

That does not go down easily with many of our deans who resist such budgeting changes. □

#### Flexibility

I think the key feature that all institutions in our society are driving for is flexibility, increased flexibility to deal with a rapidly changing world.

Those institutions that are not capable of achieving flexibility are going to decline and perhaps disappear.

They're going to be swept aside.

In the corporate sector, they've achieved more flexibility by decreasing the number of permanent long-term employees

and making far more use of part-time flexible employees to deal with certain missions.

This is also clearly happening in higher education.

Most of our institutions are making far more use of flexible staff--lecturers, research scientists, clinical faculty--rather than tenure-track faculty.

This creates a very serious personnel problem, of course.

But I suspect that universities will follow courses quit similar to those pursued in other sectors.

We will inevitably be driven toward a smaller and smaller core of permanent individuals, whether it be faculty or staff, using more and more in the way of people that come in for limited periods of time to address various missions that tend to change.

That is the nature of the times in which we live, and I think that if we don't move towards that we're going to become so ponderous and resistant to change that our viability is going to be very threatened.

It would be great if changes swirling about higher education were on a slower time scale than in the rest of our society, but this simply isn't the case.

It always amazes me how rapidly companies are able to respond when the alternative is Chapter 11.

Both complex decisions and complex execution can occur on the time scale of weeks or even days.

The glacial time scales characterizing the university decision process are simply no longer acceptable.

We simply cannot survive in this time of change unless we ourselves are capable of far more dramatic and rapid change.

#### Spin-offs

Examples:

Internet

Willow Run

UM Clinical Delivery System

#### Strategically Constrained Evolution

How to protect basic mission and values?

Constraints

Questions

#### The Challenge of Change

It depends enormously on the institution.

The University of Michigan has not been in crisis.

We had a scare in the early '80s, but we certainly don't have a crisis now.

And yet, I worry whether you can achieve the degree of change that you need without some degree of anxiety or even fear.  
I worry about that.  
I would like to think that opportunity and hope and excitement can motivate people to change.  
But sometimes it takes a wolf at the door to get their attention. What happens if you don't have a convenient wolf nearby? Do you have to create one? I don't know.  
We're trying lots of things, but whether we can achieve the degree of change we need without the wolf at the door, but we continue to have doubts.,

### **Back to the Future...**

For the past half-century, the Bush paradigm of federal patronage of investigator-driven research has determined the nature of the research university. Only 125 of the 3,600 institutions of higher education are research universities, but these are just the institutions at most risk as the federal science and technology budget shrinks in the years ahead. Don Langenberg, Chancellor of the University of Maryland goes even further: "It is probably about as safe to assume that the dominate higher education institutions of the 21st century will stem from this small but powerful group of present day institutions as it would have been to assume that today's dominate life form on Earth would stem from Tyrannosaures Rex."

There are some obvious responses to this precarious situation:

1. Clearly universities must shift from the public to the private sector for support to accommodate the erosion in state support. Beyond seeking corporate support for R&D, they will need to more aggressively market educational service and put in place most realistic prices structures (e.g., tuition and fees) that accurate reflect costs.
2. They must also shift rom "faculty centered" to "student-centered" activities...that is, from "provider-centered" to "customer-market".
3. And, finally, there are growing signs that there will be a shift from "elitism" and "excellence" to the provision of cost-competitive, high quality services--from "prestige-driven" to "market-driven" philosophies.

Let me focus a bit on this third issue. It seems clear that a shift is now occurring in public attitudes toward research universities. For the past half-century, the Bush paradigm characterizing the government-university research partnership has been one built upon

the concept of relatively unconstrained patronage. That is, the government would provide faculty with the resources to do the research they felt was important, in the hopes that at some future point, this research would benefit society. Since the quality of the faculty, the programs, and the institution was felt to be the best determinant of long term impact, academic excellence and prestige were valued.

Yet, today the public seems reluctant to make such a long term investment. Rather, it seems interested in seeking short term services from universities, of high quality, to be sure, but with cost as a consideration. In a sense, it seeks low-cost, quality services rather than prestige.

Perhaps rather than moving ahead to a new paradigm, we are in reality returning to the paradigm that dominated the early half of the 20th century...the "land-grant university" model. In fact, perhaps what is needed is to create a contemporary land grant university paradigm.

When the Morrill Act was adopted in 1862, it was aimed at establishing programs in agriculture, mining, and the mechanic arts--the forerunner of today's schools of engineering. That we were successful is obvious. The vast natural resources of our country produced immense wealth for some and a higher standard of living for most. The agricultural experiment stations and cooperative programs were enormously successful. In the last century our universities, particularly land grant institutions, created and applied knowledge, and provided human resources needed to address critical national problems.

A land grant university for the next century could be designed to develop the most important resource for our future--not our natural resources, but rather our human resources, as its top priority. The field stations and cooperative extension programs could be directed to the needs and the development of the people. While traditional professional fields would continue to have major educational and service roles and responsibilities, increasingly, new interdisciplinary fields should be developed to provide the necessary knowledge and associated problem-solving services in the land grant tradition. □