The Future of Land Grant Universities

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The United States has for long had the world's premier system of higher education. No other country has anything that comes close to our major research universities (whether they be private or public), and that includes our international competitors, Germany and Japan. Our society expects a lot of our universities, and much more than other countries expect of theirs. For example, we were the only country in the world that turned to our universities (and especially to our land grants) to deliver an important part of our foreign policy in the form of economic and technical assistance to the developing countries. Our universities were also given the responsibility of catching up with the Soviet Union after sputnik. And our society has long expected our land grant universities to educate the masses, to be agents of economic change, and to serve as the main vehicle for our economic development programs. In fulfilling these general tasks it has also provided a common base of intellectual skills that are required of the citizens of a free democratic society.

Yet today our system of higher education is faced with challenges such as it has not faced within the memory of most of us (Schuh, 1992a). Our internal stresses are great, as are the pressures as we seek to find our way in a society that is undergoing phenomenal domestic change, and which seeks to find itself in a world undergoing a massive reconfiguration of economic and political power. The collapse of the Soviet empire and the liberation of the countries of Eastern Europe grab the headlines. However, the emergence of the Newly Industrialized Countries challenge our ability to compete in international markets, and the developing countries, which we tend to ignore yet which account for the bulk of the world's population, are beginning to experience economic growth similar to that experienced by the industrialized countries of the West. That means that within many of our lifetimes, billions of people will be empowered with economic growth as we have experienced it in the industrialized West.

In the post-cold war era, nations will increasingly compete in the economic and intellectual realms. Although the need for a strong military will not disappear over night, if ever, our ability to defend our standard of living and to have influence in the international community will depend increasingly on our ability to have a strong knowledge base on the rest of the world. It will also depend importantly on our ability to compete internationally. This in turn will depend on the investments we make in science and technology, in the production of new knowledge, and in our knowledge of other cultures and societies.

That is a rather long way of saying that the health of our system of higher education is critical to the future standard of living of our citizens, and to our ability to defend our interests in an increasingly competitive international economy. That means we need to understand the problems we face in higher education, and to undertake the needed reforms of that system if we are to sustain our position in the world.

My assignment today is to discuss the future of the land grant universities. This system is under a great deal of stress, ranging from a decline in financial support, to charges of lack of relevance, to complaints about too much emphasis on research

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*Dean and professor, Humphrey Institute of Public Affairs, University of Minnesota, Minneapolis. Paper presented at annual meetings of Southern Agricultural Economics Association, Tulsa, Oklahoma, January 31 - February 3, 1993. I have benefitted from helpful comments on an earlier version of this paper from Jim Bonnen, John Brandl, Morris Kleiner, Robert Kudrie, and Leo Raskind.

J. Agr. and Applied Econ. 25 (July, 1993): 112-121

(as if that were a sin!) and not enough attention to teaching, to questions about what faculty actually do with their time and attempts on the part of state legislatures to regulate faculty time in the classroom. These stresses are a reflection of changes in the economic, political, and social environment in which these universities exist.

I will argue below that we will continue to experience stress in the future, largely in response to the rapid changes in society, but that we can revitalize ourselves if we return to our roots - to the things that helped make us great in the first place. This will require that we recapture our sense of institutional mission, reorganize ourselves internally, and find new ways of financing ourselves. It does not mean that we romanticize about the past, or attempt to slavishly imitate how we once organized and managed ourselves. It does mean that we try to recapture the *essence* of what we were in the past and apply it to today's rapidly changing world - with a constant eye to the future.

Some Background

Before going into a discussion of these issues, it is useful to review the growth in our educational and research enterprises, and in their complexity. This growth and increased complexity are critical to understanding some of the problems we face.[1]

The educational enterprise in this country has experienced phenomenal growth. Between 1955 and 1990, for example, enrollments in U.S. colleges and universities increased by 400 percent. While this expansion of the teaching domain is enormous, it is modest compared to the explosion of research and scholarship that has occurred since World War II, an expansion fueled with funding from the Federal government. In 1955, the U.S. spent $409 million in academic research; by 1989, that figure had climbed to $13.9 billion. In constant 1982 dollars, academic R & D expenditures climbed 54 percent between 1980 and 1989. These data document a very rapid expansion of the national effort.

Another development creating stress in the research universities is their greatly increased complexity. A number of things are at work. First, the expansion of higher education has involved a broadening of higher education from a caucasian elite to the masses, including minority groups. This broadening of access involves students with a wide variation in the background with which they enter the university, thus requiring a great deal of remedial work. It also means that the universities, like the larger society of which they are a part, are now much more multicultural. When this is combined with the integration of American society into the international community, multiculturalism has become a much more important issue.[2] Whereas there was at one time a consensus on the standard curriculum for higher education, that consensus has broken down and created serious stresses and strains. This traces in part to the shift from a male elite faculty to a more gender, racial, and ethnic diverse professoriate.

This culturally driven increase in complexity is compounded by the growth in the number, variety, and technical content of professionals requiring university training. Preparation for most careers at one time had nothing to do with the university. Knowledge for such careers was provided largely through apprenticeships or other forms of on-the-job training. Today, training for the professions is a major function of the university, with the number of degrees awarded in this area nearly doubling between 1971 and 1985. Moreover, a host of new careers, ranging from business, banking, finance, social work, architecture, and the performing arts, also requires university preparation and certification - many at the postgraduate level. These developments have contributed to the complexity of the research university, and to its increasingly fragmented identity.

A third development creating stress in the research universities is the rapid advancement in the frontier of knowledge. Associated with this advancement is an increase in specialization, both among individuals and in academic departments. The specialization makes it increasingly difficult for the person on the frontier of knowledge to apply his or her knowledge to the solution of society's problems. This leads to charges of irrelevance. The departmental or disciplinary specialization leads to fragmentation within the university. It also leads

to alienation, both among the faculty, and between the faculty and the students, especially at the undergraduate level.

These are three very important, significant, and pervasive developments. We should not be surprised that our universities are experiencing stresses and strains. The stresses are compounded by a growing expectation that research and our universities can and should solve all the problems in society. In some respects this is a monster of our own creation. As we beat our drums and promote ourselves to obtain more funding, we are to some extent our own worst enemies because we promise more than we can reasonably expect to deliver.

Some Other Stresses on the System

In addition to these greatly expanded demands on our services, the land grant universities in particular face a number of unique stresses. One of these is that we are now so widely emulated in the educational system that we have lost our uniqueness. Many private universities, and especially the large ones, have long had research programs. Now, even small liberal arts colleges have significant research programs. Similarly, almost all colleges and universities have outreach programs of one kind or another. Imitation is the best compliment. But as we all become increasingly alike, it is difficult for us to argue our uniqueness as the basis for specialized funding.

Unfortunately, these developments have occurred at the same time as we in the land grants have tried to become more like the private elite research universities. How many times have you heard the president of a land grant university articulate the goal of his or her university as becoming the MIT or Harvard of the Middle West, or the South, or whatever?

Similarly, the growing demands for higher education and for professional education has led to a proliferation of public institutions. Many states such as Indiana, Iowa, and Michigan have for some time had large state universities that complemented their land grant university. Recently, there has been a proliferation of state-funded community colleges, additional state universities, and technical schools that are typically created independent of the land grant universities and quickly develop their own (often regional) political base. They have become strong competitors for the educational dollar and fractionated the political support for the land grant university. In many cases they are perceived as being more relevant to the needs of society, largely because they appeal to regional pride, while at the same time paying closer attention to the students.

New communication and visual technology also poses a threat. Students don't have to go to college to learn mathematics, English, foreign languages, and other subjects. They can learn these skills by buying a video at their local store. Much of what was at one time standard fare at land grant universities can now be acquired from the private sector, with the learning taking place at the student's leisure. Similarly, developments in the communication sector, especially two-way television, greatly extend the range of enterprising educational institutions. They don't have to have the Nobel Laureate on their faculty. They can hire him or her for individual classes and thus greatly enrich their offerings. Moreover, such institutions can deliver their educational programs right in the backyard of competing institutions.

Finally, there is the growing marketization of the educational system, something I have alluded to above. Professor Zemsky of the University of Pennsylvania has called attention to this phenomenon by making a comparison with developments in the retail marketing system of our economy. That system has shifted successively over time from large department stores, to malls, to outlet malls, and now to specialized catalogue shopping. At each step in the process some of the overhead was squeezed out of the system. At the end of the process, what is left is a simple market transaction between a buyer and a seller, with no complementary services.

In Zemsky's view something analogous is occurring in this nation's system of higher education. The system is being forced to be leaner and leaner, and services we used to provide by means of cross subsidies are being squeezed out of the system.

In my view we are faced with two alternatives as a consequence of these market and budget pressures. We can simply spin off many of the services we provided in the past, which tends to

be the first reaction of universities in response to a budget squeeze. Some of that "shedding" is probably healthy. Alternatively, we need to find alternative ways of financing and delivering many of the things we used to do under the rubric of overhead. Unless we do we will find the educational establishment going the same route as our retail marketing system. In the transformation we may lose much of the symbiosis and synergism between research and instruction. We may also experience a substantial decline in the quality of the educational experience for our students.

What Will We Look Like in the Future?

The economic, political, and social forces currently pressing on the land grant (and other) universities (and colleges) are inexorable and likely to continue into the future. For the foreseeable future, and within our current planning horizons, we can expect them to continue. It is in taking note of those forces that we can understand what our future will be like.

Teaching

First, I expect the demand for educational services to continue to expand at a rapid rate. Contrary to widespread belief in the educational system, this demand is not driven primarily by the changing demographics of our population. It is driven in large part by the changing economics of education.

For example, past deregulation of the economy, global competition, and the rapid inflow of immigrants have widened the structure of wages and salaries in our economy. This increases the private rate of return to higher education. Impressively, the huge outpouring of graduates from our colleges and universities has not narrowed that differential. To the contrary, the differential has actually widened. Moreover, recent research with data on identical twins has documented the significant impact higher education has on personal incomes. (Ashenfeltet and Krueger, 1992). Each additional year of higher education has been shown to raise income by 16 percent. Cumulate that increase over four years and one has an impressive impact on lifetime earnings. The market will continue to respond to such high rates of return.

This high rate of return is a result in part of the rapid advance in technology in most of the production and commercial processes in our economy. There is a strong connection between the rate of technological change in society and the rate of return to education. Cognitive skills are needed to decode the knowledge imbedded in the technology used in the economy. As we look to the future, international competitive forces will probably induce an even faster pace of technical change. Technical training and education at the undergraduate level will be increasingly important.

The increase in demand for education will not be just for formal education in resident instruction programs, however. The pace of change in technology and new knowledge, together with the continued increase in life expectancy, will increase the demand for mid-career training and education. If we are to be responsive to this increased demand, and our future probably depends on it, we will need to "extend" our classroom offerings out into the community and offer them at times when the opportunity costs of the time of potential students is low. This means at night, in special packages over weekends, and in special packages in places of work.

I expect the increased dependence on markets in the allocation of our educational resources to continue to grow, at all levels of the educational system. In fact, I expect the use of the voucher system as the means of providing subsidies to education to eventually win out, and probably in the relatively near future. The allocation of educational subsidies to specialized educational institutions such as the land grant universities probably made sense in the distant past, especially when society wanted to favor certain kinds of education such as agriculture and the mechanical arts. It probably doesn't make sense in today's world, in which the demand for educational services is so complex that a consensus on where the subsidies should be allocated is not possible.

In the future, the subsidy will attach to the student, probably be uniform over the population except for a possible means test, and citizens will use the market to express their choices. Painful as it will be for many, if not most of us, this will lead

to a more efficient allocation of educational resources for the nation as a whole.

The corollary to this development is that the days of uniform tuition rates within a university are probably nearing an end. The cost of tuition will have to cover the marginal cost of delivering particular educational services. My guess is that this will bring about a significant reconfiguration in the subject matter our colleges and universities offer. Cross subsidies within the universities and colleges will decline and for the most part disappear. The curricula and the structure of course offerings will have to meet the market test.[3]

The effects of eliminating cross subsidies is far reaching, and in some respects disturbing. It in effect "unbundles" the university and seriously erodes its public good capability. This ultimately destroys its land grant nature. The land grants thus become comparable to any other institution (private or public) in society that delivers educational services.

Still another corollary is that the economics of delivering educational services will be much more important in the future than they have been in the past. We can expect to see a great deal more specialization among colleges and universities, with probably fewer colleges of agriculture, for example, with the stronger and more effective ones being the survivors.

These same competitive forces will probably cause a lot of activities universities currently deliver themselves be spun off and only the services contracted for. This will include such things as police services, food services and bookstores. This will ultimately make us more efficient and possibly more able to respond to our clientele.

Colleges and universities will have to make more efficient use of the student's time in the future. We have not done a good job of that in the past, especially in the land grant universities, in part because we have had somewhat captive audiences. In the future that will no longer be the case. Moreover, the opportunity cost of the student's time can be expected to continue to rise in the future.

The forces driving this increase in the opportunity cost of the student's time are complex. First, the value of time will increase as per capita incomes rise. Second, as educational subsidies are spread across a larger number of students, they will probably cover a smaller share of the total tuition costs of schooling. Students will increasingly have to work their way through school, and they will be more sensitive to the use of their time. Finally, as the demand for more and more mid-career training and education increases, an increasing share of our students will inherently be working.

Another significant change in the demand for education will be an increase in the demand for international education. The pace of globalization of our economy, and of our political processes for that matter, as national economies become increasingly well integrated, continues at a rapid rate. We are witnessing a remarkable opening of national economies as country after country shifts to a greater dependence on markets to organize their resources. That will increase the demand for knowledge and skills that will enable members of the labor force to participate in what will increasingly be an international economy and society. Our citizens will need knowledge on the international economy and society if they are to be effective and productive members of our labor force and if they are to make their political choices for a truly global society.

Finally, we face an urgent need to adopt the latest in new communication and media technology in our teaching programs. It is little short of incredible that we who are producing the new knowledge and technology for society have lagged so much in this area. The driving force of competitive pressures makes it imperative that we adopt this technology if we are to survive. We desperately need to find ways to make more effective use of computers, two-way television, improvements in the telephone system, and other recent developments. We need to do this in the classroom as well as in helping the students link up with library resources. We can recover and retain our uniqueness as educational institutions if we quickly find an economically efficient new balance between the delivery of hands-on teaching services

and the physical capital in which the modern communication and media technology is imbedded.

One of the challenges in this area will be to find the resources to acquire this new technology. Another, and perhaps more important challenge, will be to develop the skills of the faculty to use it. What makes these challenges so daunting is that the pace of technological change in this sector continues at a rapid rate. Investments in our telecommunication system are making the advantages of fibre-optics communications systems increasingly available. In addition, one of my colleagues tells me that within a few short years our students will all be carrying computers that are about the size and weight of a hard-cover notebook. In the meantime, our colleges and universities are making significant investments to make available a state-of-the-arts in computers that is rapidly becoming obsolete. Technological obsolescence in the means by which we deliver our educational services will be an increasing challenge in the future.

Research

Let me now turn to the issue of research in our universities. I don't expect the research function to disappear from our universities, even though the research function, too, faces very great pressures from changing technological and economic forces. The complimentarities between research and teaching are just too great. However, I expect the way that research is financed and how it is organized within the colleges and universities will change. The competitive market pressures and our growing integration into the international economy will be the driving forces.

Let me start with the pressures from the international economy. Remaining competitive in the international economy will become an increasingly important issue of national policy. We will increasingly recognize the need to be competitive if we are to sustain our standard of living. The policy process will recognize that and begin to allocate science and technology investments on that basis.

In the future I expect an ever larger share of our support for research to come from the federal government and from the private sector. As noted above, becoming and remaining internationally competitive will become an element of national policy. Moreover, the spill-overs from investments in higher education and in new knowledge and technology are so great that state governments will have less and less incentives to make them, especially in light of the growing budget pressures created by the shift to state and local government of an ever larger share of our social and welfare programs. State governments will be important investors in the support of producing new technology only in those cases in which the technology is highly location-specific. That means it will likely remain only for such activities as agricultural technology, and for exploitation of local natural resource endowments such as mineral deposits and possibly forests.[4]

An increasing share of our support for research will come from the private sector because of the complementarity between teaching and research. This complementarity between teaching and research gives the universities a comparative advantage in doing research. Unfortunately, we have not fully exploited that comparative advantage, in part because we have believed that accepting support from the private sector will distort our research programs. I have argued elsewhere (Schuh, 1992b) that need not be the case, especially if university administrators will take more responsibility for the allocation of research resources. In fact, I have argued that integrating our activities more closely with the private sector will help us recover part of our land grant mission and thus contribute more effectively to society.

In the future I expect market forces to again be a driving force in this area. The technology of doing research is advancing very rapidly, driven in part by the advances in the frontier of knowledge and the increasing cost of making new advances in knowledge. This technology now requires huge investments in instrumentation and in research equipment such as supercomputers. Moreover, it requires advanced skills on the part of the researcher. Unfortunately, budget pressures have caused the universities to lag so much in making these investments that in many cases it is not possible to train our graduates in the use of this equipment.

The potential complementarities between research and teaching will eventually cause the private sector to see the advantages of helping pay for the cost of the modern equipment in the universities and colleges. This will in turn make it more efficient to do an important part of the research in the university. Thus, we can expect the linkages between the private sector and our universities to grow in the future, with all the complications that will bring in terms of managing our academic enterprise.

Another important issue on the side of research is that in the future I expect how research is done within the university to be significantly different than how it has been in the past. Don Kennedy, former president of Stanford University, has noted that there is a lot of mediocre research within the academic community. Much of it is repetitive of what is done elsewhere, and much of it is far from the frontier of knowledge.

Strong competitive pressures and the decline in cross-subsidization within the university will make it difficult to sustain such mediocre research in the future. Either research skills and knowledge will have to be upgraded (see below), or some of the existing faculty will have to specialize in some kinds of teaching, including in mid-career programs.[5]

I also expect these competitive pressures to shift our research efforts away from their current bias towards serving disciplinary interests and towards research that makes our economy more competitive over time. This need not mean that our contributions to the advancement of knowledge will be any less. After all, many of the advancements in knowledge come from efforts to solve the problems of society.

These competitive pressures will also lead to more institutional specialization in research, with applied research perhaps growing in importance. It is by being relevant to the problems of society that we will be able to attract the resources we need to support our larger academic enterprise. We will not abandon our basic research activities, because our work in those areas is what will make our applied research more productive. Moreover, there is also a high level of complementarity between basic and applied research. Doing both within the same institutional framework has significant advantages.

Extension and Outreach

The demand for "extension" courses will grow rapidly in the future. It will come from all across the economy, however, which means that the full breadth of the university will need to deliver outreach and extension services. In addition, I expect the demand for technical assistance to grow over time in response to competitive forces in the economy. A key issue will be whether that technical assistance is delivered by the private sector, or by specialized units of the university. I am not very sanguine about which direction this will go. My hunch is that it will go towards specialized private-sector companies that will maintain strong links with the universities, another example of an emerging partnership between the universities and the private sector.

An important issue here is whether the land grant universities will take advantage of the significant agricultural extension delivery systems they have in their respective states, or whether they will let them continue to decay and decline, as they have been doing in the past. If they decide to take advantage of them, and I believe doing so is an important key to our future, they face some major challenges. Major investments will be needed in the field staff since the mix of skills they will need will be significantly different than what they now have. In addition, new institutional linkages will be needed within the university so the specialized skills in the academic faculty can be accessed effectively and efficiently. Finally, the involvement of the faculty from all across the university will have to be obtained by the development of new reward and incentive systems.

Outreach and extension programs involve rather larger cross subsidies from within the university. If competitive forces drive out these cross subsidies, and the direct public support for these activities continues to decline, the last rationale for a publicly supported university will have disappeared. Sadly, society will have lost a lot. Jim Bonnen reminded me in commenting on an earlier draft of this paper that no user will ever pay for a comprehensive rural development program, or for many other activities the benefits of which

accrue to the non-affluent or are so diffusely distributed that no one has an intense enough interest to pay for it.

Major challenges also face those parts of the universities that deliver the courses for mid-career programs. These need to be increasingly delivered outside the immediate community in which the university is located. They will need to be delivered on something approaching a cost-of-delivery basis, since cross-subsidization will decline. It will be imperative to take advantage of the latest in new technology that makes it possible to extend the skills of the best of our academic faculty out to the local communities, where future demand will be.

Management and Organization

How we will be organized and how we will manage ourselves will undergo significant change in the future. Some of these issues have been discussed above. However, I expect nothing less than a major revolution on this front. Universities will have to become efficient and will have to allocate their resources more effectively. They will be part of an increasingly competitive part of our economy, one in which higher-level educational systems will in some sense become increasingly alike, but in which there is a great deal of innovation driven by competitive market forces. The competitive pressures will be great.

Out of this increasingly competitive environment I expect to see university administrators have an increasingly greater role in the management of human and other resources within the university.[6] The days of managing the universities by committees are rapidly approaching an end. Academic entrepreneurship will be an increasingly recognized talent on the part of administrators, and the challenge will be to combine entrepreneurship with academic knowledge to manage the educational and research enterprises effectively.

This empowerment of administrators will undoubtedly be resisted by the faculty, who have grown accustomed to using the cover of academic freedom as the basis for doing whatever they want. The drive for efficiency, and the increased threat of lower salaries if it is not realized, will, however, gradually persuade the faculty that they need to be effectively managed, and thus to accept the management of chairs, heads, deans, and vice presidents. Out of this stress one can expect to see new systems of faculty governance emerge.

For a period of time we will probably see an increase in the mobility of faculty as universities specialize and individual faculty have to move in order to capitalize on their particular talents and abilities. That will be just part of a general state of turmoil as the general system of higher education makes the transition in response to the changes in economic and technological forces. Unfortunately, academia may no longer - except for a chosen few - be the quiet isolation of the ivory tower. Those chosen few will be those who absolutely need the quietude to do their work.

There is one important feature of the universities that will need attention as these competitive pressures work themselves out. The demand for investing in the human capital of the professoriate will increase dramatically. Continually upgrading the skills of the faculty will be the key to staying competitive. The challenge will be to determine what share of these costs the individual will bear and what share the universities will bear. I suspect that in the future such investments will be a requirement if the individual is to retain employment. I also expect the universities to provide important incentives for the faculty to make such investments, and to increase their own investments in them as well. Thus, I fully expect the successful universities of the future to develop depreciation funds to refurbish the intellectual capital of their faculty.

Finally, there is the issue of tenure. My guess is that we can expect lifetime tenure to decline as an institutional arrangement. My perception is that it is already declining. The competitive pressures of the future and the increased marketization of the educational and research enterprise will make it an increasingly difficult institutional arrangement to sustain. Moreover, when the educational and research enterprise is so large and so competitive, it is not clear that it is still needed, at least to protect academic freedom.

What I expect to evolve in place of tenure are long term contracts of a variety of forms. The universities will increasingly draw on short term

hires for an important part of their teaching. They will try to tie those with highly valued and unique skills to them with longer term contracts. The commitment to make investments in the upgrading of the individual's skills will probably be associated with contractual arrangements. The structure of salaries will also widen very significantly. In fact, if we want to have a glimpse of our future, we should probably look to the sports sector, where unique and specialized skills play an important role.

All of these changes imply a great deal about organizational structures within the university. They also imply a great deal about the kinds of skills needed to manage the modern university. Time and space limitations preclude my addressing those issues at this time. They are an important item for our future agenda, however.

Concluding Comments

The changes I have outlined above will put enormous pressures on the large land grant universities. They will have to be organized and managed differently in the future. The competitive forces will be great. Faculty will have to change their personal orientation, perhaps specializing or finding different employment. The organization of the universities will probably have to be flattened out, with the growing number of associate and assistant vice presidents eliminated so more direct accountability is attained. The regulatory burden society has imposed on the university is so significant (even staggering), that overhead costs for satisfying these regulations will continue to be a burden.

None of these changes will come easily. The rewards for anticipating the changes and adjusting to them will be great. The real challenge, however, is whether we want to preserve the land grant concept and the internal cross-subsidies it implies. If we do, we will have to make the case with the body politic that the public goods we are capable of delivering are worth preserving (and financing). That will require leadership of a high order. Moreover, it will require that those of us in the land grant universities remain capable of effectively and efficiently delivering those public goods. Good rhetoric will not be sufficient.

References

Schuh, G. Edward, "Universities Under Stress," presented at Symposium, "After Fifty Years of Change, Wither the Land Grant University?" sponsored by the Hubert H. Humphrey Institute of Public Affairs and the University of Minnesota's Graduating Class of 1942, Cowles Auditorium, University of Minnesota, October 15-16, 1992a.

Adkinson, Richard C., and Donald Tuzin, "Equilibrium in the Research University," *Change*, May/June 1992, pp. 21-31.

Ashenfelter, Orley, and Alan Krueger, "Estimates of the Economic Returns to Schooling from a New Sample of Twins," Princeton University, Princeton, New Jersey, 1992.

Schuh, G. Edward, "Privatization of Agricultural Research at Land Grant Universities," prepared for the Office of Technological Assessment," U.S. Congress, 1992.

Rosovsky, Henry, "Annual Report of the Dean of the Faculty of Arts and Sciences, 1990-1991," Harvard University, 1991.

Rosovsky, Henry, "Voices," *Policy Perspectives*, Institute for Research on Higher Education, University of Pennsylvania, Philadelphia, Vol. 4, No. 2 (September 1992), Section II, pp. 1B-2B.

Endnotes

1. The data and some of the substance in this section are drawn from Adkinson and Tuzin, 1992

2. In an earlier point in our history the common educational theme of this nation's educational establishment tended to bind people of disparate cultures into a unified *country* to facilitate the melting pot view of America.

3. There is an important set of equity issues involved with the changes, both within academia and in society at large.

4. State governments are also likely to be financially strapped in the face of demographically-driven demands for elementary education and health care.

5. See Schuh, 1992a, for some suggestions.

6. Henry Rosovsky, former dean of Harvard's Faculty of Arts and Sciences has called attention to the problems associated with the growing independence of faculty and the failure of university administration to manage them. (See Rosovsky, 1991 and 1992).