Where Are Land-Grant Colleges Headed?

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On 4 Nov. 2004, I was asked to be the featured speaker at the fall initiation banquet of Gamma Sigma Delta, The Honor Society of Agriculture, Tennessee chapter. I was honored to have been asked, and congratulated all the new initiates and award winners, pleased that their achievements had been recognized. I proceeded to talk about "Where are land-grant colleges headed?", a topic on which I had done some reflection and had earlier published a short opinion piece in the *Chronicle of Higher Education*. Several of the attendees felt that my views should be read by students, faculty members, and administrators alike, to form the basis for lively discussions nationwide. It is to facilitate wider dissemination of this material that I write this Forum article.

Sixteen years ago I had four heart bypasses. After I recovered, I decided that life was too short to equivocate, for whatever pretext, and that when reason, logic, and facts led me to a conclusion, I would neither hide it nor sugarcoat it. I have communicated enough to know you can connect with readers by telling a joke; it is a tried and true formula. But this article is not a normal article for a normal time. Today, this is a serious moment in our history, and I want to connect with the seriousness of this moment.

Each one of us bears a burden to assure that future generations are shaped as completely, as objectively, and as humanely as has been done to us by the institutions we have known. I am worried that we may be allowing the university we hold so dear to be reshaped, remolded, and recast in ways that are alien to the characteristics of institutions of higher education we have known and loved. American institutions of higher education are the great beneficiaries of centuries of intellectual development at European universities that forged the notion that free and untrammeled inquiry, in an environment featuring the snug harbor of academic freedom, is clearly in the public interest.

Land-Grant Colleges: A Uniquely American Concept

One of the greatest innovative ideas that the USA ever had was the land-grant college concept. The original Morrill Act was passed by Congress and signed by President Lincoln on 2 July 1862, with the aim to open institutions of higher *education* to the sons and daughters of shopkeepers, artisans, and farmers. The grant of western lands made possible the flowering of the idea. Later, a public commitment to *research* directed to the needs of farmers was added to the land-grant university in the Hatch Act of 2 Mar. 1887. It provided for a permanent appropriation to each state each year for the purpose of establishing an agricultural experiment station. The third function, *extension*, was given shape and funding by the Smith-Lever Act of 1914. The three functions, long viewed as co-equal in the land-grant university, proved to be a remarkable response of government and of the academic community to the needs of the rapidly developing agricultural and industrial sectors of America.

By the early years of the 20th century, strengthened programs in natural and physical sciences bolstered training in agriculture and engineering, and scientific principles were applied to teaching and research in agriculture. The land-grant colleges were the foundation on which modern agricultural productivity and efficiency were able to rise and flourish. In the middle of the 19th century, one farmer could, with some difficulty, feed his immediate family; 150 years later, one farmer, supported by capital investments and a developed societal infrastructure, could feed another 150 persons. Thus, the USA could provide food for many other people in the world. Another example: 80 years ago, 2 billion bushels of corn were produced on 90 million acres; 75 years later, four-and-a-half times as much corn was produced on 20 million fewer acres. There is no other industry that can claim that kind of increase in productivity over such a time period, and this was due in no small measure to the efforts of land-grant colleges.

Other countries, immersed in different cultures than the USA, have tried, with great difficulty, to adopt this concept. During my career, I have observed or participated in agricultural education and research on five continents other than North America. I am convinced that, along with the Constitution of the United States and its Bill of Rights, with their guarantee of religious tolerance and of the rule of the majority while safeguarding the rights of all minority groups, the land-grant concept was one of the main reasons that our country became such a great nation and world power in the 20th century. The land-grant colleges helped to foster a prosperous agriculture to undergird the entire economy. Although many countries have tried to emulate the concept, very few have succeeded, preferring to conduct agricultural investigations in research institutes, in isolation from teaching responsibilities housed in ministries of education, and separate from extension activities located in departments of agriculture and deemed unworthy of attention by "real" scholars.

Balance Needed among Research, Teaching, and Extension Functions

For several decades, the three functions were viewed as equal in importance. In recent times, however, the pendulum has swung away to an emphasis on research. Not only that but, because of the pleas of some vocal advocates during the last 25 or so years, increased support has accrued to so-called "basic" research at the expense of applied research. A greater balance should be restored among the functions. This can be accomplished, and *must* be accomplished, if we are to expect the kind of generous public support the land-grant university has traditionally enjoyed. A land-grant university has multiple constituencies to please—students, peers in the respective disciplines, users of extension information, farm producers, the agricultural industry, and taxpayers. If we slight any one of the

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groups, we will pay a price. At this time, we are paying less attention to students, to users of extension information, and to taxpayers, and more to worrying about whether we are impressing the disciplinary peers who establish the pecking order of institutions, and to solicit grants. It is clear that governmental support is at risk—the land-grant university needs to demonstrate that it cares about and *is responsive to* the needs and wants of people and their real-world problems. That is an integral part of the land-grant mission.

The unfortunate by-product of the efficient and prosperous U.S. agriculture has been an estrangement of the increasingly urban population from the source of its daily bread, to the extent that many children nowadays believe that milk comes from a carton rather than from the udder of a cow or a goat. This has been accompanied by the abdication by the U.S. Department of Agriculture of its traditional role of oversight of Hatch appropriations, tolerated by an uncaring Congress. Another consequence has been the spectacular decline in rural population, ensuring that there will be fewer students of agriculture in the future and fewer representatives to advocate its needs. I imagine that many of us here do not come from a rural background. Do we really have at heart the betterment of agriculture in Tennessee or the USA?

Politicians and other prominent citizens often reflect, and sometimes amplify, the ignorance of their constituents. Consequently, during the last 50 years, there has been a steady and rapidly accelerating decrease in government support of agricultural research, teaching, and extension, which have thus become victims of their success. This is particularly true of the federal support, which for many years was regularly appropriated on the basis of a formula based on the size of a state and of its agricultural economy and population. The assurance of a steady yearly financial resource made it possible for investigators to plan and carry out long-term important research projects that did not necessarily enjoy the fleeting acclaim of the day, for example, those dealing with the management of perennial crops that did not have vocal advocates but are essential mainstays of an environmentally responsible resource husbandry. The decreasing federal support has led to land-grant colleges being supported mainly by state tax revenues. These are increasingly scarce, partially because of federally mandated spending on welfare and health programs, renewed emphasis on funding K–12 schools, and a burgeoning prison population. Some states also benefit disproportionately from pork barrel projects, for example, Senator Bond's Missouri's Biotech Center, Senator Russell's Research Center in Georgia, or Tennessee Governor McWherter's aborted swine research lab in a state with hardly any hogs. Most states, including ours, will need to reevaluate whether agricultural colleges devoted exclusively to instruction are justified or needed in the future in view of decreasing enrollments and resources.

Administrators traditionally were responsible for gathering support for land-grant colleges. Now, the onus for obtaining financial resources has been shifted to the investigators. I well remember a speech I heard from a newly appointed administrator a few years ago in which this executive stated "since previous administrators of this institution have been unsuccessful in maintaining public support at an adequate level, we shall now insist that each one of you obtain the support necessary to maintain your programs! and those of you who do not get such outside support will be encouraged to seek employment elsewhere." In other words, since this official was not going to do the traditional job demanded of that position, the administered would now have to do it.

Restoring the Mission of Land-Grant Colleges

Land-grant college administrators campaigned for many years for the de-emphasis of the formula allocation and its replacement by competitive programs. Superficially, this seemed appropriate: reward impartially chosen merit and embrace the competitive American spirit. In practice, this eliminated long-term research planning by individual investigators and de-emphasized long-term resource management, since budgets were available for only 1 or 2 years at a time. A self-perpetuating system of grant evaluation was created also, whereby former colleagues and graduates of "prestigious" institutions ensured that most support was awarded to those they knew, to the exclusion for the most part of those not in the network. In retrospect, therefore, the advocacy of a competitive grant system was the beginning of the death knell for the majority of the smaller, medium-sized, and 1890 land-grant colleges. These institutions felt they should continue their traditional mission of applying science for the betterment of agriculture and the public in their area, state, or region, and did not have the resources to do that at the same time as they added a fundamental basic research mission. Thus, in the last couple of decades, many medium-sized or smaller agricultural land-grant institutions began falling back in their capability to compete on the national and international scientific scenes. This trend has accelerated because of limited resources and the confusion brought on by the swift advance of many scientific breakthroughs that often are beyond the understanding of the tax-paying public. Most people are unaware of the slow and costly development work needed to turn scientific advances into everyday applications. This is often purposely complicated by investigators or their administrators who make outlandish claims for the marvels that their particular science can accomplish, in the hope of garnering additional glory, power or resources, such as claiming wonders from investigations at the frontier of basic research when in fact the potential good that humanity may garner from their discovery is many years in the future and will require the efforts of many other investigators to adapt their breakthrough to reality.

It is clear that only a few land-grant institutions—those which, for historical reasons or because they are located in a relatively rich state—can devote a substantial-enough portion of their resources to create the kind of teams of scientists needed to delve into the nature of DNA or RNA bioengineering. Such research is extremely expensive and demands the undivided attention of large numbers of investigators working together toward a common goal. It is highly unlikely that the land-grant institutions that are lagging by several years into these fields, as most of them are (like Tennessee), can possibly obtain large enough infusions of resources to catch up with the handful of universities that are recognized as leaders in these fields. This is not to say that biotechnology cannot provide an excellent and powerful tool as an adjunct to successful existing programs, for example, those in crop or animal improvement where the identification of protein or gene constituents for specific traits may permit rapid advances toward the solution of identifiable problems. The attempts by

administrations to force an about-face in many land-grant colleges, thereby forcibly pushing faculty members to change the approaches in which they are competent and have been successful, are doomed to failure because such reversals are difficult and take considerable time. How can the five colleges (University of Arizona, Purdue University, University of Nebraska, Ohio State University, and Texas A&M University) that stated in 2000 that part of their mission was to become the premier agricultural college in the USA all achieve this exalted status? As one of the early observers of the trend, Edward Schuh asserted in 1986: "The land-grant universities have lost their way." In this quest, existing programs, resources, and personnel, even in recognizably successful programs, have been and are being sacrificed without regard to their merit or future value. Related disciplines that developed as joint efforts for over a century are being split apart arbitrarily to satisfy political intrigues. Infusions of well-trained beginners to replace personnel experienced in traditional agricultural sciences will result in traditional disciplines being abandoned. At the same time, emerging sciences will be covered by inexperienced persons who have little commitment to the betterment of agriculture and rural life in the region of their employment through the use of science to solve practical problems.

We need a substantial reorientation of effort, not to downgrade theoretical research, but to lift up a model of excellence in terms of a comprehensive approach to evaluating and rewarding all program dimensions, ranging from theoretical research to mission-oriented research to extension and to teaching. Anything less is intellectually dishonest and a betrayal of the great land-grant tradition. To give lip service to the importance of all three functions but to recognize only a portion of one is intellectually hypocritical.

As professional agricultural investigators have searched for the "almighty dollar," they have been forced to bend the mission of research, teaching, and extension for the public good to compete successfully for grants, thereby having to pander to the short-term objectives of granting agencies rather than being guided by the long-term needs of agriculture and its participants. University groups that used to be aggregates of scholars toiling for the public welfare have become individualistic and narrowly focused technicians who ingratiate themselves to grantors. Individual teachers and investigators have conveniently forgotten the fact that "few human beings will admit to servitude" even though, as Titus Lucretius Carus first recognized almost 2000 years ago "whose bread I eat, his song I sing."

Administrators have often confused the adoption and use of seductive new tools as progress, rather than subjugating these powerful techniques to the needs of the overall mission for the public good and the long-term needs of agriculture and its producers. They have gone so far as to abandon nationally and internationally recognized programs when these disciplines did not qualify in one of the hallowed categories. Consequently, for instance, when a biomolecular breakthrough may occur in a few years there will be very few, if any, scientists capable of adapting the new technique or material to the exigencies of the real world. The applied scientists who could have done that will long have been retired or fired, and the extension services who could help producers or practicing professionals apply the discovery will have been savaged. What a shame!

Unless we speak up, reverse the trend, and convince legislators and policy-makers that the current trends will be disastrous in the long run, the great experiment of the U.S. land-grant concept of interconnected research, teaching, and extension for the public good—so successful in the past—will become nothing more than a fond memory for those who recognize its greatness. Returning to my worries, my greatest concern is that the land-grant university is on a trajectory that will dramatically narrow its traditional constituency to the point of invisibility. That would be a tragic legacy to leave future generations, for it may well be that future generations will lack the willing partner that has helped our generation to understand and cope with that change. As one of our greatest presidents, Abraham Lincoln, said in his Annual Message to Congress in December 1862, in a slightly different context but one that can be stretched to apply here, "The occasion is piled high with difficulty, and we must rise with the occasion…. Fellow citizens, we cannot escape history…. We—even we here—hold the power, and bear the responsibility." I charge *each one of you* to take this matter to heart.

What Should We Do About It?

I invite you—the students who are soon to face lifetime decisions, and the faculty who helped them learn to think—I invite you to ponder and reflect on the following statements or questions:

- Who is our constituency? Is it students, the public that pays our salaries, rural and urban users of extension information, farm producers, some private-sector firms, future generations who benefit from the great body of transmitted knowledge? Or is it a relatively small group of peers in the discipline, a few oligarchs on a Board of Trustees who have little knowledge or interest in agriculture, some self-serving bureaucrats, or private sector firms whose primary interest lies in the bottom line?
- Those of you who have tenure, I urge you to remember that tenure was invented and is cherished to protect you when you express unpopular opinions. Remember with Mark Twain (1904) that, "whenever you find you are on the side of the majority, it is time to pause and reflect." Remember that when a paternalistic authoritarian administrator stands firm behind a poor, unanalyzed decision, that is *not* noble, and it is worthy of your questioning. Do not accept irrational discourse or decisions that are made under the guise of greater efficiency or political expediency.
- It is critically important that the singular pursuit of excellence, on the basis of only one of the three traditional functions of a land-grant university, be appropriately tempered by attention to extension and teaching as co-equal functions, as well as applied research. As we scrounge for grants, are we losing the concept of the land-grant university?
- Land-grant universities should foster and promote widely a brisk dialogue on the land-grant mission and tradition in the rapidly changing environment of the 21st century. To ensure that this will occur, you *each* must communicate with your federal and state representatives, senators, and officials, and with the general and the agricultural public, and their specialized associations. It will require great vigilance in the future to assure that we continue our combined three-fold mission for the public good, rather than for the gratification

of boards of directors of industry and foundations, of entrenched bureaucrats, or of ambitious administrators.

Finally, as a last word from a young-minded old geezer to the newer generations, from someone who had to compensate for not being as smart or knowledgeable as many others, I say that the motto "labor omnia vincit" (hard work conquers all obstacles) has helped me a lot throughout my career, and you also may find it useful. For those of you who may wish to look into the topics of this letter in greater depth, I include some suggested readings.

SUGGESTED READINGS

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About the author…

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Henry Fribourg, Emeritus Professor of Crop Ecology, retired from the University of Tennessee in 2001 after a 46-year career in teaching and research. He taught undergraduate and graduate courses in forage crops, pasture and beef cattle management, crop ecology, statistics and experimental design, and crop climatology. He is the author or co-author of more than 400 articles, 6 book chapters, and an autobiographical book. Ever since he learned about the Morrill Act while a graduate student at Iowa State, he has been an admirer of the U.S. land-grant college system.