

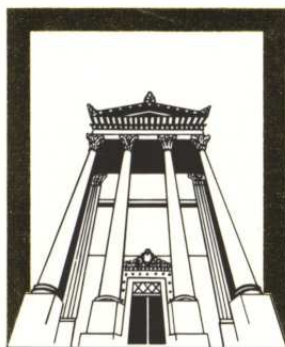
The Challenges and Necessity of Change

by Dr. Gordon Pryor Eaton

President

Iowa State University

March 29, 1987



INAUGURATION ADDRESS

We are living today in uncertain times. Iowa State University of Science and Technology, under economic stress for much of this decade, owing to negative changes in the several economic environments in which it has been attempting to function, must pause and reflect on where it is going next and how it is going to get there. It is time we now make formal accommodations and adjustments to our changed environment.

The economic vicissitudes that have been visited upon this university, and upon the State of Iowa, and upon our parent nation have been, and are, quite profound, and in some ways they are as unsettling as those which overtook us during the Industrial Revolution. They are neither entirely local in their origin, nor are they going to be transient in their duration, as the record of much of the past two decades shows. We must, therefore, ask ourselves if our current mission, the size and distribution of our student body, our academic standards for admission, our present organizational structure, our traditional ways of approaching our basic tasks, and perhaps even some of those basic tasks themselves, are altogether appropriate to the new times and to the new environment. Changes of the sort to which I refer require proactive institutional adaptations that we have yet at this institution to begin to undertake, despite our rather substantial and prolonged economic discomfort.

In the last century, the Industrial Revolution saw a jarring translocation of our economy from one that was based on highly dispersed handicraft and labor-intensive agriculture to a new one based on the enormous effectiveness and speed of powered machinery and the emergence of mass production manufacturing. The agricultural sector, itself, was one of the major beneficiaries of this revolution.

Among other things, the Industrial Revolution changed the relationships among the various peoples of the world. The changes with which we are struggling today in this country are also fundamentally economic in their nature; and they are once again affecting the basic relationships among the peoples of the world, this time through the emergence of a powerful and a highly competitive global economy and related global capital markets in which our state, Iowa, and our country, America, are presently losing some of their independence and their former strategic advantage.

INAUGURATION ADDRESS

The Industrial Revolution was made possible by the creation of knowledge, new knowledge, that was gathered to help our society cope with problems of production and economic growth. Our land-grant university system was created in its midst, and a substantial proportion of the new knowledge that was required to assist the nation at that time flowed from these new kinds of institutions of higher learning. Explicit missions were defined for them. They had direct relevance to our society.

What were these missions? Let me begin to answer that question with a generalized observation concerning the fundamental responsibilities of all institutions of higher learning. Distilled to its basic essence, a college or university exists primarily to deal with knowledge: to gather, synthesize, and disseminate it to its students; to preserve and analyze it; or to create and transfer it to practical applications for the benefit of the supporting society. Some institutions of higher learning concern themselves with only a few of these very important tasks, others with all of them. We are, here at Iowa State University of Science and Technology, both by Congressional and legislative mandate, among the latter. Our concern is with all of these elements relating to knowledge.

Note, please, my reference to societal obligation. This obligation varies considerably from institution to institution. It is, for example, a fundamental characteristic which, in the degree to which it is emphasized, distinguishes some of our public from our private universities in this country. It is also, within the borders of the state of Iowa, the characteristic that sets land-grant universities, ours—Iowa State University—apart from other four-year institutions—as, for example, the University of Iowa at Iowa City and the University of Northern Iowa in Cedar Falls.

The dissemination of knowledge that I referred to a moment ago, particularly that knowledge which already exists, is not challenged as a basic obligation of a university, for it is the underlying stuff of the classroom lecture. A university's obligation to create new knowledge, however, is sometimes challenged. Within the academy walls, some worry that the role of research will somehow weaken our dedication to teaching. I have to say that I disagree. At the undergraduate level, the activity of faculty research invigorates the spirit of intellectual inquiry, it infuses the classroom lecture with an enthusiasm born of the discovery of new truths, and it sharpens our students' capacities to think, to question critically, and to analyze relationships objectively. At the graduate level,

INAUGURATION ADDRESS

teaching and research are virtually inseparable, for it is by scholarly example on the part of the members of the faculty and by personal laboratory, field, or library experience in new intellectual terrain, as much as by lecture or seminar discussion, that the graduate student truly learns.

University research has other equally beneficial and enduring values, among them the solution of society's problems, the pushing back of the edges of humankind's ignorance on many fronts, and the furtherance of competitive state and national economic growth. Collectively, these things constitute the enhancement of the economic well-being and the quality of the lives of our citizens. At this large, comprehensive, public university, research is one of our primary obligations to society, and most especially so at this very difficult time in our state's economic history. It is an obligation shared by faculty, professional and scientific staff, and administration, alike.

The current issue of *Physics Today*, the March, 1987, issue, carries a timely and illustrative article by a professor of experimental physics at the Orsted Institute of the University of Copenhagen in Denmark. It speaks to some unmet responsibilities to research at our very institution in the past. It is a story with several interesting morals, not the least of which relates directly to a lost opportunity for enormous economic growth here in Iowa. It concerns, as some of you have perhaps by now anticipated, the invention of the first electronic digital computer.

After observing that Iowa State is an excellent university, and that it has one of the first and best materials science centers anywhere in the world, the author noted:

The fascinating story of (John V.) Atanasoff's achievement provokes a number of reflections about research and innovation. The sagacity of those who should have been concerned with promoting these activities frequently left much to be desired . . . (while) Iowa State deserves credit for supporting his project at its inception . . . the officials concerned clearly had no concept of its significance, and their obtuseness cost the university dearly when they failed to apply for a patent.

INAUGURATION ADDRESS

Were that irony not enough, he goes on to say: "Atanasoff also attempted to interest IBM in his ideas, but could not convince them of the potentialities of electronic computation."

I offer this account as a classic example of the perfect vision that all of us have in hindsight, but it is a lesson, also, for our future, both for us and for other land-grant institutions around this nation.

Today's program notes and remarks by Dr. Langenberg and President McDonald* have told us that we are celebrating the 125th anniversary of the passage of the Morrill Act, legislation that created the institutions that we know as land-grant schools. We likewise celebrate, in 1987, the centennial of the Hatch Act, an important follow-up to the Morrill Act that formalized a national commitment to scientific research. The latter legislation provided for a government-university partnership in scientific research that was intended to advance knowledge and improve the quality of life.

The Hatch Act created agricultural experiment stations at campuses that had already been endowed by the Morrill Act. These facilities were:

to aid in acquiring and diffusing among the people of the United States useful and practical information on subjects connected with agriculture and to promote scientific investigation and experiment respecting the principals and applications of . . . science.

Thus did we embark, at this institution, in a formal kind of way, on the road to research. Decades later, we were reaffirmed as a major research institution by virtue of an invitation to membership in the Association of American Universities, a unique, nationwide collection of fifty-four comprehensive academic research institutions, half of them private, and half public.

In concert, these two important pieces of Federal legislation created a set of institutions that has been admired and imitated the world over. They represent one of the great American achievements of the 19th century, intelligent accompaniments to the Industrial Revolution. Despite their many successes as instru-

*Dr. Donald A. Langenberg, Chancellor, University of Illinois at Chicago, and Mr. John C. McDonald, President of the State Board of Regents

ments of economic development and innovators of social change in the past, however, they are today, from some quarters, the subject of criticism. That criticism stems in large part from the perception that the world and its needs have changed rather substantially in the period of a century, but that as institutions that were once unique, and perhaps are no longer, land-grant schools in many instances have failed to change, or perhaps have changed in ways that have not been meaningfully linked to the societies they were created to serve.

G. Edward Schuh, a Director of the World Bank in Washington, D.C., has gone so far as to suggest that land-grant universities have lost their way. He asserts, on the one hand, that many of their faculties have tended to become introverted within their own disciplines, which is to say that their academic loyalty tends more toward their disciplinary peers at other universities than to their own institution, to its mission, and most especially to the people that support and are supposed to benefit the most from it. Other institutions, Schuh claims, have emulated the land-grant concept and, in some respects, he believes, now do a better job of serving society than do the Morrill and Hatch Act institutions. While noting that society has changed greatly, Schuh suggests that land-grant universities have not attempted to relate to the new and changed conditions and environments of the societies they now serve. I would like to think that the case is overstated. As in many instances of overstatement, however, there may be a kernel of truth in what Schuh says, and I believe that we of this institution should undertake a self-examination to inform ourselves of the facts and, if necessary, to take direct action to assure that the criticism is misdirected here.

Also latent in some quarters today is a somewhat disturbing attitude of intellectual self-righteousness, one that suggests that applied research, research conducted in the solution of society's problems, is somehow not quite as worthy as pure research, that "other kind" of scholarly inquiry undertaken in pursuit of what are described as universal truths. Directing the power of knowledge against current economic and social problems has come to be regarded, according to this account, as having less value than it once did.

Let me cite an example of how I believe that we at this institution perhaps have missed an opportunity to adapt fully to the changing times. While we continue to ignore, in the general education required of all of our students, the vital importance of an under-

INAUGURATION ADDRESS

standing of other cultures and their relationship to our global interdependence and the global world economy, we demonstrate for ourselves that we have not been responding perhaps as rapidly as possible to a changing environment in which we are currently losing a race and struggling to regain lost positions of U.S. leadership in the world. Approximately twenty-five percent of our gross national product now flows from international trade. International capital markets affect our Iowa and our American economies, yet in most quarters we tend to conduct the business of instruction at this and many other institutions in vintage and rather traditional fashion. The tradition does not fit the new times comfortably.

The economic performance of both our nation and our state will be substantially dictated in the future by our ability to compete in the international marketplace. That, in turn, will be a function of our knowledge and understanding of the rest of the world, knowledge that today is still highly limited. Close to home, Iowa farmers are battling market forces that originate far beyond the borders of their home state. Many do not recognize who their real competitors are nor the basis of their competitors' market successes.

One of our challenges at Iowa State in this time of change, then, is to begin to consider how we might educate our students for global comprehension. Iowa citizens must learn to become functional members of the international community, not just out of altruism, but out of necessity. If we at this institution are to assist, as I believe we must, it will require conscious adjustments in our curriculum and in our operating structure.

Many of our Iowa students will tomorrow live abroad for substantial parts of their lives, or they will work for firms that have significant commerce abroad, or that find their company's principal competition in other nations. We must begin to prepare them to think in appropriate global terms. It is a new mission for a changed time. Iowa farmers are not immune to a need for such knowledge, for they are no longer engaged in that pastoral and idyllic activity that we all picture when we think of family farming. They are, instead, professional business competitors in a vigorous contest on a global playing field. We must help to improve and to sharpen their professional business skills, and we must help them come to understand and feel comfortable with commerce in other cultures. We must define the competition for them and they must come to learn the complex new rules of the game. I believe that it is

INAUGURATION ADDRESS

hardly a time for a wistful look backward at what once was, for it is no more, regardless of the emotional power of our nostalgia. Isolated farm life near a small, rural Iowa town has been overtaken by a game of intense international commerce and competition, and Iowa and Iowa farmers must learn to compete in it successfully or they will eventually disappear in what other business enterprises have long referred to as an industry shake-out. This is, I believe, a cold and a brutal thought, but it underscores our need to increase our knowledge of what is going on out there in the rest of the world. We no longer, we in Iowa, exist or work or profit in isolation from all those people on other continents.

Programs in the studies of other societies, specifically their languages, their cultures, their histories, their politics, and their economies, must now cease to be viewed as matters that are exotic and somehow unrelated to the rest of our curricula at this university or to the preparation of our students for their lives and for their life's work. If we can meet this challenge, our university will better be able to respond to our society's present problems.

We have many international students on our campus here today; hence, there is already considerable potential for a natural link between the present practice of extending education to those from other cultures and the creation of a new international thrust in our own domestic instruction of our Iowa State students. The presence of international students here provides expanded opportunities for Iowa citizens to interact with peoples from other lands and cultures right here at home in Iowa. This, in turn, should help build significant opportunities for promoting world peace through enhanced global communication and understanding. Such an institutional effort on Iowa State's part would be directly relevant to the emerging Iowa Peace Institute and its important work and goals.

In the last two decades there have been substantial dislocations in the international economy. And it is these dislocations that have created bewildering impacts on our own domestic economy. They have substantially reduced our competitive international position. As a result, we find ourselves with a kind of grudging dependence on international trade, a dependence that has tripled for us in the past twenty years alone, a rather stunning and a rather astonishingly rapid change considering the stupendous dimensions of our national economy here in the United States. As we ushered

INAUGURATION ADDRESS

in the decade of the 1980s, our domestic economy turned out to be almost as dependent on international trade as was Japan's or Western Europe's, a collection of relatively small countries endowed with far fewer natural resources than we.

The year just past witnessed a record American trade deficit of \$140 billion. The United States is now the world's largest debtor nation. People in other lands own more today in the United States than Americans own in international investments. This is not an image that we like, but we must stop resisting its reality and begin to acknowledge and cope with its significance.

At the same time, there has also emerged an integrated capital market in which the economies of various nations around the world have become more and more linked together. Ours is one of them. The mere existence of such a market forces upon us a demanding global interdependence.

Perhaps the most threatening assault on our sense of self-reliance here in Iowa, however, has been the loss of strategic advantage in the international agricultural marketplace. We were once "king of the hill," but have recently seen the breathtaking emergence of new competitors. Highly significant changes have been taking place in agricultural markets. Geographic production patterns are changing with surprising rapidity around the world. Although we are continuing to lose strategic advantage in this international marketplace, it is in very large part a loss to other developed countries, not to the developing countries. To cite but two examples of this, Europe, collectively, and China have both emerged as net exporters of agricultural products in this decade.

While neither our agricultural nor our manufacturing industries are as able to compete in new foreign markets as they once were, some parts of our agricultural enterprise surely still have some considerable strategic advantage. They have simply been overwhelmed, in the minds of some, and we would hope it is only temporary, by the great volatility in the value of the American dollar. And we may thus find some of that advantage returning to us, perhaps soon. But our agricultural enterprise also has potential for new strategic advantages that we at Iowa State University of Science and Technology can and must help create through new directions in research.

INAUGURATION ADDRESS

This is why we must get on with the necessary adjustments to the permanent mutations that have occurred in our institution's economic environments. We need, among other things, to implement a formal instructional program that is designed to help our next crop of graduating students comprehend the rest of the world and how it functions far better than we do today. We must make commitments and, beyond those commitments, we must make new investments, for both the industrialized nations and the emerging nations with whom we are in competition are themselves investing heavily in education and research. Why? Because they have learned that well-informed workforces and the technologies that follow from university research are critical to achieving strategic advantage on the world scene; critical, too, to elevating their standards of living and to enhancing the qualities of their lives. One measure of their certainty of this is their vigorous and proactive investments in research. Their recent moves are, I believe, worthy of our close scrutiny.

In the period from 1965 to 1980, Japan led the world in growth of research expenditures. Japan was followed by West Germany, and then by the Union of Soviet Socialist Republics and by France. In the United States, research expenditures in this very same period grew at a rate that was only one-quarter that of Japan and only one-half that of the Soviet Union!

It was the same with people as with dollars in this period. Investments of human resources in the enterprise of research were highest in Japan and the Soviet Union, followed by West Germany, the United Kingdom and France. In sharp contrast, growth in scientific manpower in the United States was only one quarter of that of the Soviet Union and Japan.

Enter now China. As the West did before them, one after another of the Pacific Rim nations is today implementing strategies for economic growth and development based on the enhancement of scientific and technological research that is linked directly to their systems of higher education. These strategies, ironically, imitate our own earlier actions. They tend to confirm this country's once-far-more-firmly-held belief in the practical value of higher education and research.

These countries that are now overtaking us in the global marketplace will continue to advance on many fronts and in many areas that were once domains of our world leadership. One of

INAUGURATION ADDRESS

these may very well be in agriculture. We, of this institution, must respond to these challenges and to the necessity for change if we are to serve the Commonwealth of Iowa in meaningful ways and, at the same time, remain a viable and respected educational institution.

We must, therefore, reevaluate our commitment to research and reexamine our faculty reward system as it relates to the conduct of research, both pure and applied, as well as our commitment to our programs of professional outreach. I am pleased to report from close observations over the past five or six months that we have at this institution some very effective and ideal models that are functioning well, models at hand on this campus that I commend to our faculty as objects worthy of study and possible emulation. Several of them are classic models of excellence in research. Two others represent contrasting, but equally effective, models of outreach intended to assist the commerce of this state. And finally, there are some models of relevance in which the thrust of scholarly research is purposefully tied to and focused upon some of the principal emphases of this institution, that is to say, the areas of science, technology, and their impact on society.

As we study these models, and others like them, we must also intensify our efforts in seeking increased governmental and industrial support for our programs of research. The Congress must be persuaded to emulate those countries that are themselves emulating an America of two decades ago. They must provide increased funding in these areas. Our nation's industries must assist them. These, I believe, or we will continue to decline in worldwide strategic advantage.

We of this institution must help Iowa regain economic competitiveness by intensifying and advancing research efforts in highly selected areas of agriculture, veterinary medicine, consumer science and engineering, as well as in specific areas of acknowledged strength in the physical, life and mathematical sciences. It is here, and in the disciplines of business and certain areas of education and design, that we can directly assist the state in rebuilding that economic competitiveness. We must strive to generate new and beneficial knowledge and actively transfer it to the marketplace for the benefit of all.

INAUGURATION ADDRESS

These represent some practical, and perhaps obvious and relevant, steps that this institution can take in order to discharge our century-old responsibilities and obligations to our benefactors and to help invigorate the quality of their lives. Such endeavors, especially in those disciplines I have just mentioned, are implicit in our full institutional name. What has been less obvious, I think, to some is the equal relevance and the equal practical value that can be attached to the humanities and the social sciences here on this campus, for it is in these fields and in their collective treasures of knowledge, that we will find the keys to a fuller understanding of other cultures, languages and economies, and the geographies of the many other nations of the world.

How close are we to being able to help today? Not close enough. I remind you that less than one percent of American students currently study Asian languages, or economics or cultures, though many thousands of students from Asian nations are enrolled in university programs in the United States in a great variety of fields. Their global awareness and sensitivity to the challenges before us all as global citizens have been much quicker than ours. Language requirements have been allowed to languish badly in American universities over the past two decades, just as have curricula in cultural, social and economic geography, and international politics.

These are a few of the reasons why we must undertake formal change at this institution. As to the external forces of change that have been thrust upon us, professional scholars of organizational behavior define the effectiveness of an institution by the degree to which it fits its environment. They assert that as that environment changes, the structure and the processes of the organization *must* be changed to maintain good fit. Our fundamental challenge then is to find that proper fit between our organization and its new multicultural economic environment, an environment that clearly extends beyond the state lines of Iowa, and beyond the boundaries of the past conventional wisdoms of higher education, and beyond the borders of America.

Some may resist the idea that this university must develop a plan for change, a change in emphasis, a change in structure, and a change in the way we allocate our resources. I believe deeply that we cannot afford to do otherwise.

INAUGURATION ADDRESS

The American Henry George suggested decades ago that, while there is danger in reckless change, there is a danger greater still in blind resistance in the face of change. The progressive John Dewey noted that many of the obstacles to change that we sometimes like to attribute to simple human nature owe, in fact, to the inertia of long-standing conservative institutions (like universities) and the desire of those in charge at a variety of levels to maintain, at all costs, the status quo. If we, at Iowa State, fail to articulate both our obligation to change and our responsibility to help solve our society's problems, the resources available to do so will be directed to other institutions in our society, as well they should be. Our world is not the same today as it was yesterday, nor can our university afford to be. The task, of itself, is enormously challenging, but it is far from impossible. Although we may today lack what we might all regard as adequate fiscal resources, we certainly are not lacking in that more critical resource, the very, very fine people, the dedicated people and the hard-working people, that make up this, the Iowa State community. They are the basis for very considerable optimism.

Let me conclude now with the recitation of some remarks from an occasion that took place nearly 200 years ago. They were uttered by one of the greatest citizens this nation has ever known, but they are just as appropriate, I think, to this occasion. Said Thomas Jefferson, in preparing to assume the office of a more significant presidency:

I repair . . . fellow citizens, to the post you have assigned me. With experience enough in subordinate offices to have seen the difficulties of this . . . I have learned to expect that it will rarely fall to the lot of imperfect man to retire from this station with the reputation and the favor which bring him into it . . . I ask so much confidence only as may give firmness and effect to (my) . . . administration of your affairs. I shall often go wrong through defect of judgment . . . when right, I shall often be thought wrong by those whose positions will not command a view of the whole ground. I ask your indulgence for my . . . errors. . . .

Thank you.

