

Automotive Conference

Personal Introduction

As many of you know, I am a scientist by training and background...indeed, I am perhaps the worst of all types of scientists...a burned-out theoretical physicist.

As such, I suffer from two character flaws:

- i) First, I tend to be a bit too candid in my remarks...
...I generally tell it like it is...
...or at least how I think it is...
- ii) Second, I tend to be one of those folks who lives more in the future than in the present or the past...

My life as a scientist and engineer has been spent working on futuristic areas such as:

- i) Nuclear rocket propulsion
- ii) Laser-driven thermonuclear fusion
- iii) Supercomputers
- iv) robotics and artificial intelligence

Hence, perhaps it is natural that as we enter the 1990s, I should find myself looking once again to the future, facing the challenge of helping to build a University capable to serve our state and our nation in the 21st Century.

My Message

My message today will be suffer from both of my character flaws as a scientist/engineer...
...it will be a vision of the future...
...and it will be unusually candid.

In a nutshell, as I look to the future, I am sensing

an ever-accelerating pace of change
in our society, in our state, in our nation, in our world.

Yet I also fear that few have realized the enormous
changes that our society is undergoing as it
approaches the 21st Century.

We are becoming more diverse, more pluralistic
as a people. Indeed, almost 90% of the new
entrants into our workforce during the 1990s
will be people of color, women, or immigrants.

Our economy and commerce are becoming every
more interdependent with other nations as
the United States becomes a world nation,
a member of the global community --
as this past year's events in China, Russia,
and Eastern Europe make all too apparent.

And we are rapidly evolving into a new post-industrial
society, in which the key strategic resource
necessary for prosperity and social well-being
has become knowledge itself, that is,
educated people and their ideas.

Let me explore this last theme for just a moment...

The Age of Knowledge

Looking back over history, one can identify certain
abrupt changes, discontinuities, in the nature,
the very fabric of our civilization...

The Renaissance, the Age
of Discovery, the Industrial Revolution

There are many who contend that our society is
once again undergoing such a dramatic shift in
fundamental perspective and structure.

Today we are evolving rapidly to a new post-industrial,

knowledge-based society, just as a century ago our agrarian society evolved through the Industrial Revolution.

Some examples:

1. Industrial production is steadily switching away from material and labor intensive products and processes to knowledge intensive processes:
2. Our nation's future has probably never been less constrained by the cost of natural resources.
3. Increasing manufacturing production has come to mean decreasing blue collar employment!
4. We are in the midst of an information revolution that is changing the basis of economic competitiveness and world power.
(Indeed, if you want to know the real reason for the recent events in Eastern Europe, China, and the Soviet Union--the collapse of communism--it was the silicon chip which created a truly international exchange of ideas and perspectives that could not be constrained by any government!)

In a sense, we are entering a new age, an age of knowledge, in which the key strategic resource necessary for our prosperity, security, and social well-being has become knowledge--educated people and their ideas.

This new critical commodity knows no boundaries.

It is generated and shared wherever educated, dedicated, and creative people come together... and, as we have learned, it spreads very quickly.

The knowledge revolution is happening worldwide and at a very rapid rate.

Michigan at the Crossroads

Needless to say, the pluralism, the globalization,
and the age of knowledge that comprise our future
will pose great challenges and demand profound changes
in our state and our nation.

The impact of these changes are already painfully apparent
to Michigan's workers and industries.

In fact, it is here in Michigan...in the heart of the "Rust Belt"
that the impact of these extraordinary changes are
most clearly seen...and felt.

We all know that past decade was a period
of great difficulty for our state...

Industries of great economic importance to our
nation such as steel and automobiles have
fallen victim to intense competition from abroad...

Plants have closed...we still have many people chronically
unemployed...or under employed

Indeed, Michigan's per capita income has now dropped below
the national average...

Michigan has dropped to 20th in per
capita income (and at \$15,393 is now
slightly behind the national average
of \$15,481)

Our unemployment rate consistently is at the
top...

And, soon, if we are not careful
our prison population will be as well...

It is clear that our state is in the midst of a profound transition...
...from an industrial economy based upon the abundance
of natural resources, unskilled labor, and, to some degree,
constrained, slowly moving domestic markets...

To a knowledge-based economy, characterized by intensely competitive world markets, rapid change, and--most important of all--educated people and their ideas.

This has not been...and will not be...an easy transition to make.

The truth is that the outcome is still very much in doubt!

We have come to a critical turning point.

Whether we will emerge from this transition as a world economic leader once again...with a strong, prosperous--albeit new--economy producing jobs and improving our quality of life.

Or whether we will fail to heed the warnings...
...to make the necessary investments and sacrifices today necessary for strength and prosperity tomorrow...

And become an economic backwater in the century ahead.

My central point is that education, broadly defined, will be the pivotal issue in determining which of these two alternative futures will be Michigan's...and America's.

Indeed, I am absolutely convinced that the dominant issue of the 1990s will be the development of our people and the education of our youth.

In the pluralistic, knowledge-intensive, global future that is our destiny, it is clear that the quality of and access to

...education in general

...higher education in particular

...and great research universities

such as the University of Michigan

and its sister institutions

most specifically of all...

are rapidly becoming the key determinants

of the strength and prosperity of our state.

The Good News and the Bad News

1. America's Strength...and Weakness

In December I attended a conference of the top scientists, government officials, and CEOs from a number of nations throughout the world. The CEO of Nissan pointed out that following an extended visit by a number of senior Japanese officials, they asked the group what they felt the greatest strength and weakness of the US were:

They were unanimous in their conclusions:

America's greatest strength was our research universities.

Our greatest weakness was public education at the primary and secondary level.

Quite a paradox, isn't it?

Quite a challenge!!!

2. BHEF

Two weeks ago I attended the annual meeting of the Business-Higher Education Forum in Tucson, an organization comprised of 40 of the nation's top CEOs and 40 university presidents.

During this meeting the CEOs stated their belief that the quality of public education in America was the most serious crisis this nation had faced since WWII!

And yet this is a crisis about which there is little public awareness, much less public consensus.

3. Growing Pessimism

In my frequent interactions with the leaders of the public and private sectors throughout this nation I detect an increasing sense of

pessimism about America's-
will and capacity to take the actions necessary
for our future.

Indeed, many now believe that that our nation is
well down the road toward "outsourcing" its
knowledge resources--just as we have been
our labor, our manufacturing, our products--
since American industry can not only depend
on domestic knowledge resources--that is,
a well-educated labor force or an adequate
supply of scientists, engineers, and other professionals.

- i) There is increasing pessimism that the
staggering problems facing K-12
education can be overcome on the
time necessary to preserve our
economic strength.
- ii) Further, despite the fact that most
other nations regard higher education
as our greatest strength, there is little
sign that this view is shared either by
our elected political leaders or the public
at large. Indeed, it has become fashionable
to attack our universities, even as we
continue to seriously underfund them.
- iii) The rapid growth of "transnational" companies
which seek resources, whether they be
labor, processes, or knowledge--wherever
they can get them at highest quality and
lowest price--suggests that outsourcing of
knowledge from other parts of the world will
become increasingly common as the quality of

American education deteriorates.

This is truly a frightening prospect. Industry has already outsourced labor and manufacturing. Can we afford to lose its competitive capacity to produce knowledge as well?

Let's face the facts, people...

We're not going to be rich and prosperous if all we do is mow one another's lawns.

Or, more to the point, engaging in financial gymnastics such as leveraged buyouts financed by junk bonds...

We have to bring something to the table of the international marketplace.

We have to generate our wealth...through our people...their knowledge and their skills.

The Challenge

Our education system is complex and decentralized and the primary responsibility is located at the state and local level.

There is no simple solution...we must push on all fronts.

We must weave a strategy of many strands--a strategy that places existing programs in a larger context that established a clear sense of direction, develops the leadership for the task, and insures continuity of effort.

Above all, we must be consistent and persevere.

Previous economic transformations were closely associated with major public investment in infrastructure such as railroads, canals, electric networks, and highways.

I believe that the coming economic transition, an equivalent infrastructure will be an educated population.

As we approach a new century, our state--just as our nation--is undergoing a profound and difficult transition

to a new economic order...

I believe that we can meet the challenge of the knowledge-based, global society that is our future.

But it is also clear that to do so will require sacrifices on all of our parts...

It will take renewed commitment to that most fundamental of all characteristics in the new economic order: quality

And it will take renewed investment in that most critical resource for our future--our system of public education.