

High Tech

TO INHERIT THE FUTURE

The president of the University of Oklahoma takes a look at the state's ability to compete for the high technology industries that have become the key to economic development in the 1980s.

Although swept by changing moods, the basic mission of the American university remains unchanged. Our first responsibility is not to train people for jobs but to educate them in the human predicament. We resist passing fashions. In a world of constant change, our purpose is to discover what is not changing. For this search, the humanities, social, natural and physical sciences, and the fine arts are most relevant.

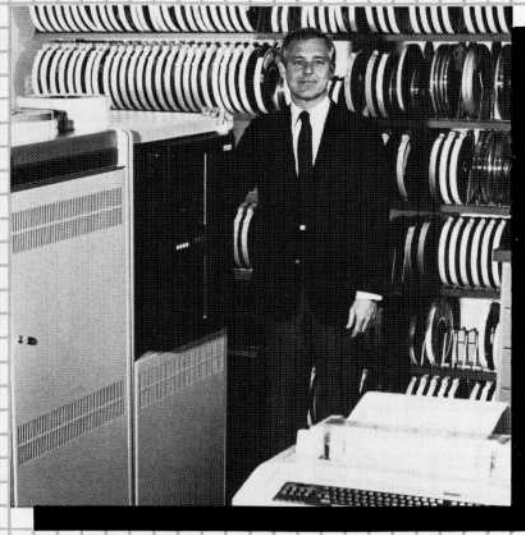
However, we must recognize that the technological waves now pounding our campuses will not soon subside. They are the waves of the future, driven by a monumental, structural change in the American economy.

When the University of Oklahoma was founded in 1890, half of the American work force was in agriculture. Today, agriculture employs less than four percent. When George Lynn Cross became president of the University in 1944, half of the American workers were in industrial production. Today, industry employs less than 20 percent. The industrial revolution, which replaced the agricultural era, now surrenders to the sophisticated, globally interconnected age of high technology. It is no passing trend. It is a sea of change.

By WILLIAM S. BANOWSKY

"As surely as America's pioneer spirit made us the industrial giant of the 20th century," President Reagan declared in his 1983 State of the Union message, "the same pioneer spirit is opening up another vast frontier of opportunity — the frontier of high technology." Marking the frontier is scientific innovation, intense international competition—and jobs. Between 1955 and 1979, 75 percent of all new manufacturing jobs in America were technology-related. In Texas, during the last four years, 50 percent of all new jobs were related to high technology; in Massachusetts, 32 percent. The electronics industry, which is growing twice as fast as the

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economy as a whole, has run up a trade surplus of more than \$60 billion in the past two years. High technology companies survive unscathed, while the traditional smokestack industries puff along at half speed.

During the past quarter century, Oklahoma competed well in attracting traditional industry, but we are falling behind. Now, we lack the infrastructure of scientists and technicians to attract high technology companies. Our tax structure is acceptable; our climate is adequate; our people certainly are willing to work. But only a handful within our labor force are trained to work with lasers, chips, computers, transistors and the sophisticated equipment of the new age.

It is crucial for all Oklahomans to realize that at the center of this new frontier are the great comprehensive universities of America. What our state must do, as quickly as possible, is make the necessary investment to propel Oklahoma State University and the University of Oklahoma to the leading edge of high technology.

For both institutions, the foundation for greatness has been laid by dramatic improvements in higher education funding during the last four years. Historic gains in academic excellence were recorded. Within four years, both universities rocketed from

the very bottom to the top of the Big Eight in terms of faculty salaries. In the decade of the 1970s, our state was a national leader in percentage increases in higher education.

Our ability to attract the attention of the high technology world depends upon excellence in scientific and technical programs, the most expensive areas of higher education. Our commitment to these academic areas is being measured against other regions of the country where program development is already under way. California's Silicon Valley, New Jersey's Forrestal Center, and Route 128 near Boston are direct products of the universities which surround them. North Carolina's Golden Triangle links its two major public universities with Duke University. A partnership between the state and its universities has created \$2 billion per year for the past five years in new industrial development for North Carolina. Just last month the University of Maryland announced plans for a half billion dollar high technology research park.

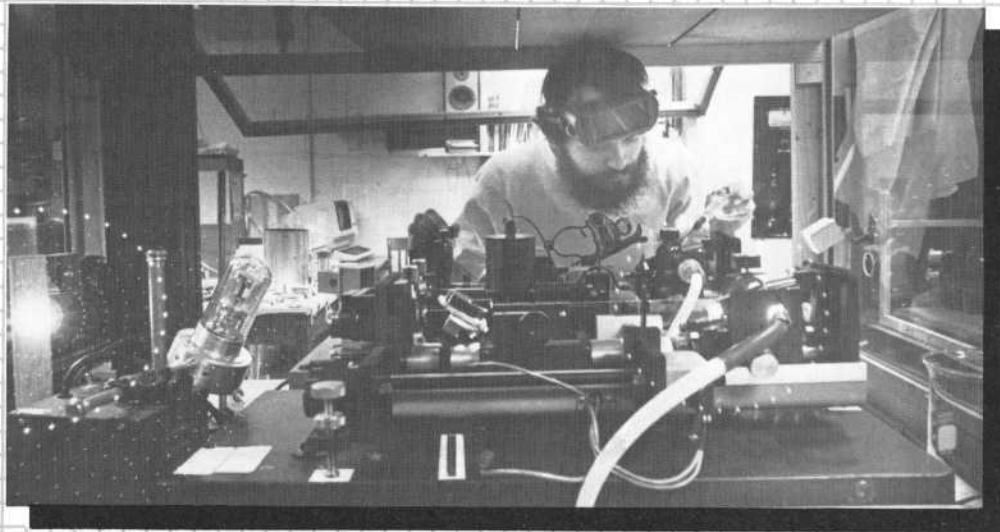
Sun Belt cities like Phoenix, Dallas, Houston and Atlanta are scrambling to compete. Thirty-three states already have invested \$250 million to attract high technology industries. Oklahoma must move forward immediately or we will miss the wave

and become marooned in the back eddies.

At the University of Oklahoma, the establishment of a world-class Energy Center provides an ideal focus for an emphasis on high technology. Construction of the 300,000 square-foot, \$45 million Energy Center begins this summer, but already it has had a dynamic effect on faculty recruiting and corporate support. Research projects of international significance are taking shape. Our present research program is expanding by building on existing energy studies.

The academic cornerstone of the Energy Center is the new College of Geosciences. Established in 1981, it strengthens the University's most highly regarded research programs. Its components are the School of Geology and Geophysics, historically an outstanding unit of the University; the Department of Geography, rated among the nation's best in research; and the School of Meteorology, ranked among the top six in the country.

At the forefront of technological education, the College of Engineering pioneered the development of interdisciplinary programs in engineering physics and geological engineering. The petroleum engineering program is one of the nation's finest and reflects the importance of the oil and



gas industry in Oklahoma. Aerospace, nuclear, industrial engineering, and metallurgy are more recent additions. Environmental science and computer science complete the engineering degree programs now offered.

More than 100 engineering faculty members and 600 graduate students are actively involved in research projects that span the entire spectrum of concerns — energy, defense, materials, transportation, health and safety. Specialized facilities within the college include the Aerospace Engineering Research Center, the Fears Structural Engineering Laboratory, the Advanced Processor Chip Design Laboratory, the Human Factors Testing Chamber and the Microbial Enhanced Oil Recovery Laboratory. The Ground Water Research Institute is host to the National Center for Ground Water Research. The college has made recent major improvements in its computing facilities with the purchase of a new mainframe computer, several mini computers and hundreds of terminals. A new laboratory for computer-aided design and manufacturing has been established.

In the College of Arts and Sciences, disciplines such as botany, microbiology, chemistry, physics, astronomy, mathematics and zoology are at the

heart of technological advances. Economic rewards from high technology will come from such current research as genetic engineering, medical microbiology, molecular biology, and laser applications. Biotechnology is of growing interest to pharmaceutical, chemical, petroleum and agricultural industries in need of highly trained scientists.

OU's Health Sciences Center, a major medical complex in Oklahoma City with a branch in Tulsa, is one of the leading teaching, patient care and research institutions in the Southwest. Currently being developed at the HSC is the University/Industry Cooperative Center for Biomedical Research, a high technology research center. The nucleus of this facility is a computer-driven microscope that is so sensitive and accurate that it can detect biochemical changes of a precancerous or cancerous state. The applications of the system are limited only by the imagination.

High technology requires a new breed of industrial leaders for America. Well-trained as technicians, they thrive on the opportunity for innovation and the pressure of competition. But they are not only scientists and engineers; they are also entrepreneurs. The creative visions of the most gifted scientists do not emerge successfully from the laboratories

without managers and venture capitalists to manufacture and distribute products throughout the marketplace. With faculty expertise in fields influencing economic and industrial development, the College of Business Administration takes its place in the high technology arena.

A quality of life that is attractive to the world's most sophisticated scientists and technicians may be as important to high technology as science and engineering. The university that will become a prominent part of a high technology center will be an institution where excellence extends into the total university environment. This means artistic and cultural opportunities through the fine arts as well as a continuing commitment to the traditional arts. Students broadly educated in history, literature, languages, philosophy, and the social sciences will be best prepared for the changes that will take place in a high technology society.

To inherit the future, Oklahoma must have a nationally distinguished University now. Make no mistake; it will be expensive. Yet we cannot delay payment until it is convenient or expedient. If the citizens of Oklahoma are unwilling to invest in their own future, we will all pay the price in lost opportunities for decades to come. 