DON'T LOOK NOW, BUT WE'RE BEING WATCHED

S. L. Rotary Club

Tuesday, March 3, 1981

President David P. Gardner

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As tempting as it is to engage your time this noon hour with a discussion of the University's fiscal problems brought on by the interaction of inflation, enrollment increases, government regulation, the withdrawal of federal dollars in critical teaching areas, three years of major reductions in our state budgets and the prospect of a bleak fiscal 1981-82, I shall refrain from doing so, not only because it is a discouraging and demoralizing subject, but also because it closely resembles the same problems you men in business are having in our impaired economy. Besides, I would prefer to accent the positive by sharing with you not our problems but instead what the "U" is doing that deserves your attention, and, I hope, your respect and support.

My topic today -- "Don't Look Now, But We're Being Watched" -- occurred to me in New York City a few weeks ago when , walking in downtown Manhattan on the way to an appointment, I saw an article in headlines on the front page of the New York Times reporting that the University of Utah intended to implant an artificial heart in a human. A similar report in the Washington, D.C. papers the next day also caught my eye as I visited there on University business. The public interest in this prospect parallels the truly great achievement of our health care teams last year in successfully separating the Hansen Twins in what was a triumph of modern medicine brought about by superbly trained and uncommonly dedicated physicians, nurses, technicians, and others associated with this unprecedented event.

I imagine every Utahan and most of America are now aware that the University of Utah has developed an artificial heart, a device

that set an operational world record in a calf named Tennyson. But Tennyson and his mechanical life-sustaining organ are only the tip of an informational iceberg. For example, last month a national magazine, in describing the development of Silicon Valley in California, reported that a Bionic Valley is now emerging in Salt Lake City as a function of medical and bioengineering research at the University of Utah that "promises to shake up the entire health-care system." The article which cited the technological partnership of businesses in our city and the University, concluded that "all this innovation ferment is putting Bionic Valley on the map. (Salt Lake City) is reminding us that America's genius is far from dead ... the artificial heart could represent a kind of rebirth -- both for the patient who receives it and for the society that produces it."

During the past year, University accomplishments have been covered by all the major U. S. television networks and leading stations in Germany, Japan, and Argentina. Major newspapers in America, Japan, Germany, England, Canada, the Middle East, South America, and China have carried major stories on the University of Utah and articles are being developed or have already recently appeared in Time, Newsweek, Business Week, Discover, Omni, Smithsonian, Readers Digest, Science Digest, Science, and Sports Illustrated, among others.

The University of Utah ranks high in research support --- 29th out of 674 colleges and universities (public and private alike) in the country that receive federal support for research and development activities. If we include the work of the University of Utah

Research Institute (our applied research arm), then our equivalent ranking would move up to 26th in the nation. There is no better single measure of the regard in which we are held nationally than this, for the research monies come to us, not by formula or because of politics, but as a function of a peer review system that allocates these research dollars to the place where the best work will be done. Our volume of research has increased steadily during the past 15 years, especially in health science and energy related fields and in the basic sciences as well.

Roughly half of the federal government research support at the "U" is in the health sciences, funded mostly by the National Institutes of Health. Our second major source of support is split between the Department of Energy and the National Science Foundation. The DOE support reflects our strong position in fossil fuel research and the NSF our strength in the basic sciences. In a recent nationwide competition for coal research awards, for example, the DOE awarded 40 proposals out of 550 submitted. The University of Utah was the only school in the country to receive three of those awards.

May I take a moment and share with you some of the work which is underway in our laboratories and clinics:

U of U scientists are literally reinventing body parts.

-- The so-called Utah Arm, developed by our scientists and engineers, is a prosthesis that will soon help those amputees who often relegate their artificial limb to a drawer because it is uncomfortable and difficult to operate. The Utah Arm doesn't use gears and pulleys. Instead, the amputee simply "thinks" about moving his arm and it responds. It moves because a micro-computer reads

electrical signals in the remaining muscles and delivers just the right amount of energy to motors in the arm. Not only is the Utah Arm quiet, attractive, and durable, it is the closest thing to a natural arm available today.

-- An eight-pound wearable artificial kidney the size of a small suitcase is making life more bearable for kidney patients. People who must be treated on dialysis machines three times a week face a demoralizing and exhausting experience. The portable WAK gives them a chance to lead more normal lives. This year 21 "Dialysis in Wonderland" trips are planned throughout the country which will permit 210 kidney patients to be free from their bulky hospital machines, many for the first time in years.

-- A useful artificial hearing device has been difficult to develop, but progress this year is encouraging. Totally deaf volunteers in the laboratory are actually understanding vowel sounds, words and simple sentences without lip-reading. The computer that is used today to stimulate nerves in the volunteer's inner ear fills half a room. In the future, microcircuit technology will reduce the device to vest pocket size.

-- Although surgically replacing tiny veins and arteries is nearly impossible, a University team has developed a new flexible material for artificial blood vessels that pulsates with the natural vessel as blood surges through it. The new polyurethane-type surface is durable and it doesn't cause blood clots.

-- We've all felt that pang of anxiety at the sight of a hypodermic needle. Our bioengineers have devised an easy, safe, and painless way to transport certain drugs or anesthetics through the

skin by a low electric current.

-- Dr. John A. Dixon, a former Vice President for Health Sciences and former Dean of the College of Medicine, is now conducting some of the nation's most intriguing developmental work in laser surgery. John heads the Medical Center's Division of Endoscopic and Laser Surgery -- which is one of the first of its kind in the nation. Without going into great detail about this important work, let me say that Dr. Dixon and his colleagues can now control bleeding to a degree never before possible, shorten operating times, and deliver the laser beam to previously inaccessible areas of the body.

-- Those low-flying helicopters that have become a common sight and sound in our community don't always mean that Channel 2 or 5 is watching you. Quite often they may be on an errand of mercy as part of the University Medical Center's AirMed transport system which utilizes both fixed-wing aircraft and helicopters. Last year more than 1,500 patients benefited from the service and AirMed aircraft traveled more than a half-million miles in covering a six-state area. AirMed has the distinction of being the largest fixed-wing operation in the United States in terms of area served and number of flights.

-- Utah's medical genetics program is moving ahead at a startling speed. It was the subject of a major article in Science this past week. There are more than 50 genetics-related research projects being conducted in the College of Medicine alone, which involve more than 30 researchers and $3 million in federal funding. In the past year the college has received an additional $3.5 million for genetics research, of which $2.4 million alone will be applied in a

cardiologist's study of the genetic and environmental determinants of hypertension. Our competence in this area is what prompted the Howard Hughes Medical Institute to establish one of its twelve national laboratories at the University, part at the Medical Center and part on lower campus in close proximity to the departments comprising our College of Science.

-- Energy research is also a diverse and expanding activity at the "U," where synthetic fuels development is a technological reality, and, increasingly, an economically feasible alternative to conventional energy sources. Our wide-ranging efforts place us among the nation's leaders in programs to convert coal to liquid and gaseous fuels and to develop tar sand, oil shale, and geothermal energy.

-- Lesser known, but equally important, are the University's emerging programs in minerals processing and exploration. A growing problem for the United States will be that of securing strategic minerals for both industrial and military purposes. Studies show that the United States has self-sufficiency in only nine of 32 strategic minerals. When the University's new Energy and Minerals Research Center -- to be housed in what was the former U. S. Bureau of Mines complex on campus -- becomes operational in 1983, the "U" will have significantly advanced its capabilities to contribute fundamentally important research and to educate and train students in these two areas vital to our country's security and economic vitality.

For example, University researchers are already in the fore-front of applying computer technology to the critical science of extracting metals from ore bodies. The computer is enhancing

industry's ability to obtain metals economically from low-grade ores. The highest percentage of energy used in minerals production occurs in the initial ore-crushing stage. By experimenting with computers to control every step in the process, U researchers are finding shortcuts that promise to reduce the high costs of energy. With lower and lower grades of ore being mined, their work is assuming greater and greater importance.

-- The "U" has become one of the few educational institutions in the country to achieve the parallel capability of both designing and fabricating integrated circuits -- one of the bedrocks of modern industrial development. The recent donation of a $600,000 computer system by a Massachusetts firm has boosted U research aimed at reducing the burdensome man-hours required to convert an electronic circuit from a first-stage abstract diagram to an actual layout ready for production. The combination of the Computer Science Department, where the design work is done, and the HEDCO laboratory on campus, where the circuits are built, provide us with a major position in the world of microelectronics. During the past few years, and in recognition of this competence, many of the nation's leading computer technology companies have donated expensive research equipment -- equipment that is far outside the school's ability to purchase.

-- The U. S. Geological Survey's selection of the "U" as one of six regional research recording centers confirms our expertise in the area of earthquake studies. Costly computer systems were donated by the federal agency to each of the designated centers, which, in addition to Utah, include Cal Tech, Columbia University,

University of Washington, University of Colorado, and St. Louis University. This provides for faster and more detailed analyses of tremors. The "U" system records earthquakes that occur along the span of the active Intermountain Seismic Belt, which includes Utah and parts of two other states. The "U" is also headquarters for the 60-station state seismograph network. Seismic activity recorded at the field stations is telemetered back to the campus, where the data are recorded for a wide range of analytical studies.

While University research and teaching in the sciences tend to capture most of the press space and people's attention, the scholarly research and education that underpin and give meaning to the more scientific and technological dimensions of modern life are nurtured, valued, and supported by the University as well. The modern university is, after all, society's principal means of advancing and transmitting the culture and conserving and preserving it as well. We take that responsibility seriously at the "U," even when, to some, the utility of what we do appears not to be cost-effective.

-- In the arts, the U of U will sustain its national position in ballet education under a new master plan jointly conceived by our Ballet Department and Ballet West. We expect the program to be a model for other schools and to attract students from all over the United States. Dancemagazine and other magazines have already asked for interviews about the new program that calls for renewed ties with Ballet West and anticipates admitting students as early as age 14. Our ballet faculty will also gain dancers and teachers of international stature under the agreement. Incidentally, one faculty member,

Professor Dede Albers, was the first American dancer allowed to study at Russia's famed Bolshoi Ballet School.

-- The Pioneer Memorial Theatre, which sustains a proud tradition in Utah, annually presents theatre in all its aspects -- from musical, to light comedy, to the great dramatic works, both ancient and contemporary.

-- Each year the University sponsors innumerable lectures and concerts benefitting and enriching the lives of countless of our citizens.

-- When it comes to Liberal Education, other universities clearly look to us for guidance. Our program has a nationally recognized position in the reform of Liberal Education that has been occurring at universities in recent years. Our liberal education program is one of the few programs in the country that was chosen as a model for other college programs and featured at a national symposium held last summer. This is also true of the University Honors Program which is among the very best with which I am acquainted.

May I also report on University services to the citizens and institutions of Utah which have a direct and daily impact on people's lives:

-- a program which allows an inmate to earn a bachelor's degree while at Utah State Prison.

-- the managerial and marketing expertise provided by the University in helping establish a new shirt factory in Blanding, Utah.

-- the Small Business Mini-Maxi Program offered by the College of Business which helped the United Noodle Manufacturing Company of Salt Lake City increase its annual sales.

-- the assistance an elderly widow received from a hearing aid specialist in the Speech and Hearing Clinic.

-- the help provided by the Poison Control Center in saving the life of a 14-month-old boy who had swallowed a highly toxic pesticide.

-- a program for the handicapped which allows mentally retarded youngsters to swim in the Natatorium on campus each week.

-- the facilities to care for and sustain life in a two-pound three-ounce baby in the Intermountain Newborn Intensive Care Unit.

-- the free architectural planning and design services offered to low income individuals, neighborhood groups and non-profit organizations by the Graduate School of Architecture.

-- Utah's Innovation Center -- one of four in the country -- has been especially successful in helping inventive people with creative ideas. The center encourages innovation and promotes entrepreneurship in the private sector by helping inventors and fledgling businesses in scientific and technological areas to get started.

-- Small companies that are faced with engineering or production problems but lack the technical staff to tackle it can turn to the University for assistance. The Utah Engineering Experiment Station refers them to University researchers who are skilled in their areas of need. The station also plays a coordinating role between the University and state agencies on projects and studies related to energy and minerals development.

-- The Bureau of Economic and Business Research maintains the state's largest and most timely information base on the economy of the area. The bureau is currently involved in over 30 projects, ranging from the Agenda for the 80's Program to effects of expanded coal production. It is assessing the population and employment impact of the MX missile, has designed a program to inventory office space utilization in Salt Lake City and County, and is forecasting the demand for electric power in the western states.

-- A unique speech therapy program at the "U" reaches out to help parents in the community work with their own children. The program essentially trains parents to be their child's own speech therapist.

-- In chemistry, Professor Ron Ragsdale holds training sessions for high school science teachers on contemporary scientific knowledge, thus contributing measurably to the quality of science teaching in Utah's schools.

-- Both graduate and undergraduate students in the social and behavioral sciences and health education areas, at over 30 public and private nonprofit agencies in the valley, work with abused, autistic, troubled, and delinquent children, provide counseling to women reentering the work force or starting a second career, and assist agencies such as the Boy Scouts, the Red Cross, the Rape Crisis Center, mental health agencies and the courts , to name but a few.

-- The Graduate School of Social Work is taking the lead to establish a regional network of social work schools to share ideas, problems, and information related to social and human service issues. Cooperative efforts of this kind can benefit people and communities throughout the Intermountain Area and allocate scarce resources more efficiently.

-- In just a year and a half, the Small Business Development Center at the "U" has provided substantive assistance to over 120 small business owners in Salt Lake County. From 60 to 100 hours of study and consultation on problems of accounting, marketing, or financial management were provided to each of these clients. Faculty and graduate students from the School of Business as well as professional

consultants and retired business executives provide these services.

-- The University's Middle East Center has a two-decade history on campus and a distinguished reputation both at home and abroad. The center has become a prime informational resource for the state on Middle-Eastern affairs and is a respected national center for scholarly research and teaching concerned with this critical part of the world.

-- the American West Center, which has been part of the campus scene for over 10 years, is presently involved in a national project intended to preserve Native American culture. The Center has sponsored and produced several hours of videotaped lectures on major topics in American Indian history by leading scholars in the field, including several from our own campus. In addition, the Center is one of the few training areas for the gathering of tribal history, which is of profound concern and interest to Native Americans throughout the West.

-- The University's expanding ties with foreign educational institutions in Europe, Britain, the Middle East, Mexico, and North Africa now includes four universities in the People's Republic of China. They include Zhejiang University, one of China's leading centers of science and engineering study. All four of the schools are located in the port city of Hangzhou. The agreement signed last fall is the first between the University and a university in mainland China. It provides for the exchange of scholars, lecturers, graduate students, teaching programs, and library materials. More than 40 students and scholars from the world's most populous country, for example, are already studying at the "U." Plans are now underway

to arrange for members of our faculty and studentbody to study in China.

In closing, may I make reference to honors and awards received just last year by members of the University's faculty and student body, which may be of interest to you. This list is illustrative and not inclusive.

-- Dr. Henry Eyring, Distinguished Professor of Chemistry, was awarded the Berzelius Medal in Gold by the Royal Swedish Academy of Sciences for outstanding contributions to theoretical chemistry, and the $100,000 Wolf Prize in Chemistry from Israel.

-- Dr. Charles E. Dibble, Distinguished Professor Emeritus of Anthropology, has received the Mexican Order of the Aztec Eagle for his work in translating the encyclopedia Codice Florentine, a cultural and historical documentation of 16th century Aztec Mexico at the time of the Spanish conquest.

-- Dr. Norihiko Fukuta, Professor of Meteorology, has received the Medal of Honor from the Soviet Union's Leningrad State University in recognition of his "significant contributions to heterogenous ice nucleation of the atmosphere and international cooperation in the field."

-- Dr. Willem J. Kolff, Distinguished Professor of Surgery and Director of the Institute for Biomedical Engineering and the Division of Artificial Organs, was awarded the prestigious Wilhelm-Exner Medal from the Austrian Gewerbeverein for his accomplishments in biomedical engineering, the Landsteiner Silver Medal from the Netherlands, the Cameron Prize awarded by Edinburgh University, and many other national and international prizes and awards.

-- Dr. William A. Guillory, Professor of Chemistry, has been awarded a Senior U. S. Scientist Award by the Alexander von Humboldt Foundation in recognition of his past accomplishments in research and teaching. The award includes an extended research stay in the Federal Republic of Germany to conduct research of his own choice. Other University of Utah faculty who have received this award in the pastinclud Dr. Josef Michl, Professor of Chemistry, Dr. Robert W. Parry, Distinguished Professor of Chemistry, and Dr. Willem J. Kolff, Distinguished Professor of Surgery.

-- Dr. Robert W. Parry, Distinguished Professor of Chemistry, has been chosen President-elect of the American Chemical Society.

-- Dr. Clifford C. Snyder, Professor of Surgery and Chairman of Plastic Surgery, has been elected Vice President of the Pan-Pacific Surgical Association. Dr. Snyder was among the team of neurosurgeons and anesthesiologists at the University of Utah Medical Center which made medical history with the successful surgical separation of conjoined twins Lisa and Elisa Hansen.

-- Dr. Jan D. Miller, Professor of Metallurgy and Metallurgical Engineering, has been named Chairman of a 4,000-member division of the Society of Mining Engineers.

-- Dr. David J. Smith, Assistant Professor of English, and Brewster Ghiselin, Professor Emeritus of English, were among 75 outstanding American poets honored at a White House "Salute of American Poets" reception.

-- Dr. Milton E. Wadsworth, Professor of Metallurgy and Associate Dean of the College of Mines and Mineral Industries, has been elected to the National Academy of Engineering. Dr. Wadsworth is only the fifth Utahan named to the NAE.

-- Mr. Bruce H. Jensen, Director of Facilities Planning and Construction, was awarded a Distinguished Service Award for excellence in the planning and development of the University of Utah campus.

-- Mr. Ramiro Cortes, Professor of Music, has received the American Society of Composers, Authors and Publishers Award for the ninth consecutive year in recognition of unique ability and talent in composition.

-- Dr. Robert B. Smith, Professor of Geophysics and Director of the University of Utah Seismolograph Stations, has been named to the National Research Council's Committee on Seismology. The NRC is the principal operating agency of the National Academy of Sciences and the National Academy of Engineering.

-- Dr. Robert K. Avery, Associate Professor of Communication, has been elected Vice Chairman of the 3,000-member National Association of Educational Broadcasters.

-- Dr. Cecil O. Samuelson, Associate Professor of Internal Medicine, has been named the new president and chairman of the Academy for Continuing Medical Education.

-- The University of Utah's Performing Danscompany has been chosen as one of five college dance companies to perform in May at the John F. Kennedy Center for the Performing Arts in Washington, D. C. The group competed in the Southwest Regional College Dance Festival in November and placed first in that competition which qualified the dancers for the National College Dance Festival in the Kennedy Center.

-- The American Institute of Chemical Engineers award the University of Utah its Student Chapters Award of Excellence for the second consecutive year. Earlier in the year, the University of Utah

chapter won first and second place in a regional scientific papers competition sponsored by AIChE.

-- A Team of University of Utah meteorology students has won a national weather forecasting contest sponsored by the American Meteorological Society. Two Utah seniors were placed first and fourth in the individual competition. Top finishers behind the "U" were Penn State, University of Missouri, and the University of Michigan.

-- The No. 1 nationally ranked women's gymnastics team will host the national women's gymnastic championship tournament in April at the Special Events Center.

-- Our men's basketball team has been ranked as high as sixth in the nation this year. We have clinched a tie for the WAC championship. The Western Regional Finals for the NCAA will be held at the Special Events Center later this month, and we are looking forward to the possibility of having our Utes return as one of the four final teams.

-- Our women's basketball team is co-champion of Region 7 and will be competing for the national title later this month.

-- Our men's swimming and diving teams are competing this weekend in San Diego for their second straight WAC championship. They have lost only one dual meet this season, to a outstanding University of Washington team, and if all goes as expected, should bring back the trophy to Utah.

-- Our highly rated men's and women's ski teams will compete for #1 ranking at the NCAA national ski championships, which will be held at Park City and hosted by the "U" in mid-March.

It has been a pleasure to share this report of the University of Utah with you today, as I regard it a privilege to remain in her service.