

Research Paying Off for Texas

By Bill Hobby

As we near an election and another legislative session, we will hear a great deal about things Texas does badly.

Let's discuss an area where Texas leads the nation--state research funds for colleges and universities.

Texas is the only state in the nation that funds competitively awarded, peer-reviewed grants for basic research and advanced technology. Two funds, the Advanced Research Program and the Advanced Technology Program, provide \$60 million in grants every two years.

It is a credit to our state leaders that they have kept financing for these funds secure despite the many demands for state dollars.

It was a wise move, because research is a close cousin to economic development. Many of the innovations developed through the Texas funds have lured investment dollars and created jobs. For example: a new Austin company, DTM Corporation, uses a technique called solid freeform fabrication, a three-dimensional copying process. This technology, which uses lasers and computers to produce complex parts without milling or machining, is being used by GM, Kodak and Pratt & Whitney. DTM has more than 70 employees and a sizeable investment from BF Goodrich.

Solid freeform fabrication was developed with a grant from the Advanced Research and Technology Programs.

These programs were born in adversity. We had some hard times about eight years ago when the price of oil hit rock bottom. We had gotten a wake-up call. Because of declining production and uncertain prices, Texas prosperity no longer depended on petroleum.

There was an urgent need to diversify our economy--to depend less on what came out of the ground and more on what came out of human brains.

At the same time, business leaders were increasingly concerned with international competition, particularly from Japan and Germany, nations that spend more of their GNP on research and development than we do.

In two words, Bobby Ray Inman, then chief executive officer of Microelectronics and Computer Corporation, told state leaders what they could do to become competitive: fund research. The result was the Advanced Research Program and the Advanced Technology Program, established originally as one fund in 1987.

The programs are peer reviewed. Only one application in eight gets a grant from the panels of scientists and engineers who choose about 400 research projects every two years. The first round of grants resulted in 110 patents or licensing arrangements, eight new businesses, \$103 million in matching funds and more than 185 corporate sponsors.

When the fund was evaluated in 1991 by a team from by the National Academy of Science's Industry-University-Government Roundtable, it was described as "so innovative and distinctive in character that we commend the state of Texas for their introduction."

"They can well serve as models for many other states in the nation," the report said.

The team also praised the technology fund for successfully transferring key discoveries and inventions to Texas industry. Here are some examples:

- Kathleen Hennessey at Texas Tech University developed a way to inspect semiconductors using a personal computer and an imaging system, replacing the onerous process by which employees inspected chips by microscope. Texas Instruments is already using the process at plants in Lubbock and Sherman.
- Tony Gorry, now vice-president for information systems at Rice University, developed a virtual notebook system for keeping medical records. His corporation, the Forefront Group, is already marketing a number of applications for this software.
- Alan Sams and Sarah Birkhold at the Texas Agriculture Experiment Station came up with a faster, cheaper way to debone poultry. It could save the Texas poultry industry \$34 million in time and energy costs.
- Two University of Houston mechanical engineers, Stan Kleis and Richard Bannerol, discovered how to use solar pond technology in raising redfish. Redfish, which you probably know in the blackened form, have been pretty much fished out in the Gulf, and they are very hard to farm raise because they are sensitive to cold. Redfish Unlimited at Palacios is using the new method with some success.
- Some of the romance has gone from research. Federal funds for academic research have declined from about \$70 billion in 1973 to about \$56 billion last year. Universities are revising curricula, improving undergraduate education, recruiting minority faculty and students and many other worthwhile endeavors, but sometimes at the expense of research.

University research is more important than ever. Many major corporations that once financed comprehensive research and development efforts are decentralizing and de-emphasizing those efforts. The transformation of Bell Lab to Bellcore is one example. More than ever, industry looks to higher education for the basic research that generates the big discoveries.

(This column was adapted from a presentation to the Southern Regional Education Board).

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