Public Benefit Should Be Focus Of Campus Effort

BY ALEXANDER R. MARGULIS*

Successful research campuses of the future require ethical cooperation of universities and industry

We are living in a period of soul searching when we are re-examining our values and everyone, from political to business and educational leaders, talks about the need for drastic changes. The problem is that all proposals are divergent making the proposals mutually incompatible.

There is, however, among all these proposals, one note of consensus: if we are to remain world leaders in providing a fulfilling life to our citizens we must increase our productivity, both in quantity and quality, and we must achieve this by finding ways to build on our strengths.

What are these strengths? They are:

1. The great ability to reach consensus among multiple, competing parts of our society.

2. Our superb research universities.

3. The ability of many of our industrial companies to gamble on new and innovative products.

4. The excellent track record, up to recently, to grant research awards and support research by peer review in major organizations that support investigation: NIH, NSF and DOE.

Although some political influences have diverted a relatively small portion of these funds into "pork barrels" and some types of valuable research have been proscribed for political reasons, the state of government research support policies is, in general, healthy. The government, however, cannot be expected to be the sole supporter of innovative research and development. To remain on the leading edge in productivity, and to stop the decline in living standards, this country must rebuild on its strengths.

Our research universities train scientific leaders, not only for this country but also a large percentage of leading scientists, for much of the industrial world. Yet, our universities have serious funding problems as government support is shrinking. This problem is well known to many and several national news magazines have had entire issues devoted to these problems. Somehow, for the good of the country, universities must find a solution to replenish support for research by diversifying the funding sources.

To advance research and transfer its fruits into industrial production, we must create partnerships between research universities, industries and government, federal and state. The distance between the university laboratory and the factory production line has steadily decreased in the last three years. The time interval from gene splicing in a university research laboratory to products offered to the public by the pharmaceutical industry has become incredibly short. Genetic engineering and the fruits of molecular biology have opened whole new product lines and revolutionized the role of medical research in many areas of industry.

In radiology, as just one example with, ultrasonography, color doppler, x-ray computed tomography, magnetic resonance imaging and magnetic resonance spectroscopy have had an equally short time reaching the public after the various university laboratories transferred their inventions to industry. Interventional radiology and fiberscopic-guided surgery have started new industries for microinstrument development, also guided by university research laboratories.

From our own research laboratories at UCSF, many successful industrial firms have been spawned: Genentech, Chiron, Scios, Sciclone, Imatron, Diasonics MR, among them. Intensive research cooperation with General Electric, Siemens, Varian, IBM, Syntex, Nycomed, Accuson, Schering, Merck, Winthrop, to mention a few, is in full bloom and producing results of value to industry and UCSF. But, for the future, this is not enough. It is just an indicator of what could be possible if we truly and intimately cooperated.

◄ Cross-Pollination ►

What is needed are new arrangements, geographic and spiritual, such as new campuses where university research and teaching laboratories will be surrounded and intermingled with industrial research and development laboratories. University scientists would have consultant positions in industry and industrial scientists would have adjunct professorial positions in their respective university departments. Postdoctoral and graduate students, as well as professional school students involved in research, would work in either industrial or the university laboratories and would be supported by industry, the government or the university and sometimes by all three. The proximity, the common faculty clubs and pubs will make frequent encounters and facilitate cross-pollination of ideas while building trust and friendships. Plans drawn on a paper napkin in a cafeteria could again give birth to a new discipline as they did once for genetic engineering. Ample precedents for

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patent and licensing rights exist in most universities that have dealt with industry.

Close relationships of this type will further shorten the time from the research bench to product. Multiple universities are currently working on such models. A good example is the Medical University of Hanover, Germany, which has created an enviable university, industry, government experiement with the San Francisco, Berkeley and the Davis campuses and the two national laboratories, Lawrence Berkeley and Livermore, working to develop similar facilities at Harbor Bay next to the Oakland Airport in Alameda.

The question arises: are such close relationships between industry and universities going to diminish the public trust in universities, which are supposed to serve monastically the public good, receiving their research support only from the government and charitable foundations because industry has as its only motive an increase in profits? At some universities, like Harvard, acrimonious debates have taken place whether a university should cooperate with industry and share the fruits of its research resulting in products.

Washington University in St. Louis and Monsanto Corporation, after many debates, have decided that this is worthwhile. To many others, including me, the answer to the ethical question is clear: universities and industry are and should be serving the public although they have different methods, paths and goals for survival and advancement. Both, however, have responsibilities to their country and these responsibilities are best served by joining forces and having university, government and industry leaders work out equitable arrangements which will serve all the partners involved. (The lawyers for all the parties should be very strictly guided, if agreements are to be reached in reasonable time.)

This prescription for national rejuvenation is bound to lead to success. It can be reproduced in many areas of scientific endeavor. The University of California hopes to establish a workable model that can be copied by others. To succeed, what is needed is vision, imagination, courage, and most of all, patience.