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INDUSTRY'S ROLE IN ACADEMIA

By ANN CRITTENDEN
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CAMBRIDGE, Mass. -- The announcements are coming out almost weekly now: Du Pont gives $6 million to the Harvard Medical School for genetic research; Hoechst, the West German chemical giant, gives $50 million to the Massachusetts General Hospital for medical research; 10 companies contribute $7.5 million for a new computer center at Stanford; Control Data, Burroughs and Minnesota Mining and Manufacturing pledge up to $5 million for computer research at the University of Minnesota; Exxon finances an $8 million project on combustion research at the Massachusetts Institute of Technology.

Corporate financing of research at universities and nonprofit institutions is surging, in response to what both business and academia perceive as a mutual need.

For the universities, it means access to a rich new source of money at a time when the Reagan Administration could be cutting back on research spending. For industry, it means access to laboratory discoveries that might lead to important new products. Stanford's president, Donald Kennedy, sees the collaboration leading to "a new era in university-industry relations."

Troublesome Questions

Nevertheless, the development raises troublesome questions about, among other things, the conflicts between academic openness and proprietary secrecy, and the distribution of rewards from new discoveries.

A report late last year on such collaboration by the National Commission on Research, a group of six academic and research organizations, warned of the "possible subversion of university independence in the choice of its research and instructional programs, as well as possible misuse of public monies for the support of private purposes."

Nowhere are these issues as well highlighted as at M.I.T., where intimate ties with business go back to the institute's founding in 1861. One early president, Elihu Thompson, an electrical engineer, had his own company while he was in office (the concern later was merged and become General Electric), and the campus is dotted with buildings donated by Exxon, Campbell Soup, Texas Instruments, Alfred P. Sloan, the industrialist who led General Motors, and George Eastman, the photography pioneer who headed Eastman Kodak. Withdrawal of Corporations

Beginning in the late 1950's, with the post-Sputnik era, the Government financing of university research began to displace corporate spending, and during the 1960's, corporate involvement receded even further, as student radicalism soured conservative executives on the campus connection. In recent years, as a result, the Government became the source of three-quarters of all basic research conducted on college campuses.

Federally financed research, however, has also come under attack. Students at M.I.T., in particular, opposed it, and the institute's administration developed serious doubts about the wisdom of overdependence upon the Government after M.I.T.'s president, Jerome Weisner, discovered he was on the Nixon "enemies list" for an expressed lack of enthusiasm for the antiballistic missile system.

M.I.T., as a result, has witnessed a major growth in corporate funding. In the last three years corporate-financed research there has tripled, from $6 million to $18 million in 1980-81.

"I wouldn't be at all surprised to see the $18 million double in the next few years," said Kenneth A. Smith, associate provost at M.I.T., in an interview. 10 Percent at M.I.T.

Today corporations support 10 percent of all of M.I.T.'s on-campus research, compared with 5 percent of the research conducted at Stanford, another renowned research institution, and only about 3 1/2 percent of research at all American universities.

Other universities can probably expect a similar, if less dramatic, rise in contracts with industry. As the gap between basic research and industrial processes narrows in such high-growth fields as microelectronics and molecular biology, companies are increasingly eager to "buy a window" on the latest knowledge in these and other critical fields.

A number of universities are beginning to wonder, however, whether corporations may also be buying undue influence over their research and licensing. One of the most criticized corporate-university relationships involves M.I.T. and its ties to Exxon, the country's largest industrial company.

M.I.T.'s biggest single corporate contract is a 10-year, $7-million-to-$8-million commitment by Exxon to finance combustion research at M.I.T.'s Energy Laboratory.

In the early 1970's, an independent oilman gave an M.I.T. chemist $100,000 to develop a methanol fuel for automobiles at the laboratory. Subsequently Exxon and Ford Motor made two unrestricted $500,000 grants to the laboratory. A few months later, the laboratory's administration canceled the methanol project, stating that it was methodologically inadequate and lacking in national significance. Case of the Motor Controller

In another case a few years later, M.I.T. granted William Barnstead, a Republican Boston businessman who has unsuccessfully run for Congress against Representative Thomas P. O'Neill Jr. three times, an option to license 11 of the institute's dormant patents. Mr. Barnstead's company used the patents to develop a motor controller that enables motors to operate more efficiently at reduced loads.

In a lawsuit filed against M.I.T. in 1979 that is still active, Mr. Barnstead said that Exxon had become interested in the device, and obtained the patents from M.I.T. despite the university's letter of intent to grant Mr. Barnstead the license.

Exxon subsequently went on to develop the controller and to acquire Reliance Electric, a leading manufacturer of electric motors, on the ground that it needed such a company to make and sell the device. Exxon, however, never did market the controller, which it now says is unworkable.

Meanwhile, M.I.T. has come under criticism for granting Exxon unusual privileges in the latest research agreement with the Energy Laboratory.

Under the agreement, Exxon and M.I.T. will jointly decide the areas of inquiry to be pursued, The arrangement also gives the company the right to review proposed reports before publication and the right to delay publication for up to 90 days if Exxon decides it wants to apply for any patents.

The agreement also gives Exxon "an irrevocable, worldwide, nonexclusive, royalty-free license under all sole and joint contract patents without accounting to M.I.T." Clauses Termed Standard

Malcolm A. Weiss, the deputy director of the Energy Laboratory, said in a telephone interview that these were standard clauses included in research agreements with other companies. Moreover, he added, "we put a lot of work into that Exxon agreement to see that nothing was excluded from the public; we got quite specific language that any patents coming out of the research have to be licensed at reasonable rates to interested third parties, and immediately, with no delay."

As for the charges that Exxon has unduly influenced the direction of the laboratory's work, he commented that "we publish a lot of stuff that Exxon and oil companies in general don't like - that even outrage them." As an example, he said that several professors affiliated with the laboratory had publicly opposed Government subsidies for the development of synthetic fuels, which, he added, "is clearly not the view of most oil companies."

M.I.T., like other, more hard-pressed universities, is eager to enlist even more corporate support. Roughly three-fourths of all basic research on campus is financed by the Federal Government, but withdrawal of that support may soon begin.

To some extent, the universities' worries of harsh cuts by the Reagan Administration may be overblown. The cuts have not been made in science research yet, and whether top research universities such as M.I.T. would suffer is uncertain.

Moreover, several new developments may produce more funds for some forms of research, not less. Several tax bills pending in Congress would stimulate more industry-sponsored research by permitting corporations to deduct part of the cost.

Despite concerns over corporate involvement in their laboratories, academic administrators agree that a diversification of backers is desirable, not only to protect universities against sudden cutbacks of public money. They say it also helps them to explore new ground in the basic sciences. 'Desirable' Pluralism

Industry funds provide "a desirable source of pluralism," Mr. Smith said. "Funding sources almost always carry subtle incentives in the direction of what research should be," he said. "The principal investigator knows what the areas of interest of the sponsor are, and he can't help but be responsive."

In the view of many administrators, the growth in industryfinanced research will steer more students into industry as a career and will strengthen the technological base of such critical industries as electronics, machine tools and chemical engineering.

Corporate support is also sought to fill what Harvard's president, Derek C. Bok, recently termed, in a speech in New York, "critical gaps" in Federal support. He noted, for example, that over the last 10 years Government money for equipment and facilities has declined by more than 80 percent in real terms. As a result, he added, the average age of instrumentation in laboratories of major universities is more than twice that of the normal industrial laboratory, and inferior to that in good laboratories in West Germany and Japan.

Finally, scientists and administrators alike stress that corporate funds involve less red tape and special conditions than Government money. As J.D. Bruce, director of M.I.T.'s industrial liaison program, put it in an interview: "A guy can write a two-page memo asking for $50,000 and get it from a company. But for a Government grant, he would need a much longer proposal, and still have less chance of getting the money."

A warning that the new funds must be handled carefully was sounded recently by Stanford's Mr. Kennedy, who was chairman of the Food and Drug Administration during part of the Carter Administration. "I believe that basic research in universities needs more, not less, relationship to industry," he told a Congressional committee. "But I believe the conditions for that relationship need to be carefully structured, if a highly evolved and highly efficient mechanism for doing basic scientific work is not to be unwittingly damaged."

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