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The Bridge Between University and Industry

University-industry relations in science and technology have long been characterized by curious mixtures of respect and condescension, of affection and irritation, of strong mutual interactions and barriers, planned or philosophical. Yet these intellectual, economic, and social interactions form the core of a complex network that most of us consider to be the basis for civilization's present progress and future hope.

The massive growth of federal support for R & D from World War II through the 1960's had an unintended impact on this network, proving it to be both more sensitive and more durable than might have been predicted. Federal funds for university research from 1950 to 1970, so lush and available seen through the rosy haze of nostalgia, did strengthen our foundation of science, our university research capabilities, the training of graduates, and hence the infrastructure for future industrial growth. But the bridge between university and industry, although neither completely broken nor abandoned, fell into disuse. Research subjects evolved from government goals and funding, and career objectives of graduates were geared to the glamor and growth of space, nucleonics, and the new age of materials science. While industrial research became stronger internally, the university research community leaned toward its new and generous patron.

The bridge with industry was rediscovered by universities around 1970, with the slowing of federal support, cutbacks in aerospace research, and narrowing of federal support following the Mansfield Amendment. Initial approaches were made by universities with overtones of "with your money and our brains"—not an endearing note, and surely not the best one on which to begin a relationship. But through the 1970's a maturing sense of mutual benefits and interdependence has emerged. Universities and industry are now building toward long-term relations that take into account each other's needs and contributions, the functions that each serves in our society. There is, in short, a sound base for a sensible working partnership.

There are signs today that federal funds for university R & D may increase in some areas such as defense, energy, and basic research. Coupled with industrial belt tightening, this could tend to divert university researchers away from industrial cooperation.

Nevertheless, there are clues to future growth. The National Science Foundation program for stimulating joint research proposals from university-industry partners is an excellent start, but must be nurtured with a clear understanding of the broad societal functions to be served. The Monsanto-Harvard and Exxon-MIT programs, with sizable funds committed to basic areas of mutual interest, are perhaps unusual examples, but partial government support might encourage others on a somewhat smaller scale. Strong industry participation in mission-oriented research institutes at universities and long-term joint projects between university research teams and single companies can provide opportunities for combining university research careers with economic growth of the private sector.

The bridge in science and technology between university and industry—sometimes strong, occasionally ignored, always important—has a unique role in current industrial societies. The difficult lessons of the 1970's have given us a base for using this bridge as a means of strengthening our national technical community. The challenge for all is to preserve this base despite future changes in federal funding.—HERBERT I. FUSFELD, *Director, Center for Science and Technology Policy, New York University, New York 10003; past president, Industrial Research Institute*