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High Technology and the Social Sciences

The recent AAAS colloquium on "R & D, High Technology, and Economic Recovery" provided multiple analyses of and justifications for the Administration's 1984 budget for research and development. The scientific and research management communities heard numerous assessments justifying defense priorities. They were also assured that substantial increases in funding of basic research in the physical sciences and engineering, primarily by the National Science Foundation, would lead to innovations in high technology and contribute to economic expansion and employment growth.

Inevitably, these analyses also raised a series of fundamental research questions about the training and supply of scientists and engineers, the problems of organizing research groups for innovation, the diffusion of knowledge and transfer of basic research from the laboratory to marketable technologies, and about the process of job creation associated with high-technology development. Each of these questions, posed at the colloquium by representatives of the Office of Science and Technology Policy, Office of Management and the Budget, and by other speakers, is central to the domain of social science. These questions, taken together, outline an agenda for basic social science research. Not all the participants in the colloquium, however, seemed to recognize the social scientific nature of these questions and the research efforts needed to understand the conditions conducive to technological innovation and the likely consequences of such change.

The challenge to the research community lies in providing research-based answers to these kinds of questions. Psychologists, sociologists, and economists have addressed these questions in studies of national laboratories, careers of scientists including Nobel Laureates, and the rise and productivity of specific industries, such as the semiconductor industry and agriculture.

A key question concerns the impact that organizational size and complexity, bureaucratic structure, and regulatory procedures have on productivity and innovation. Some analyses suggest support for small, high-technology firms will lead to higher rates of innovation and increases in employment; and policies have been proposed to support the individual small firm. But, is it the critical mass of many small firms on Route 128 in Massachusetts or in Silicon Valley that provides a creative environment? In such an environment ideas diffuse rapidly and spin-off growth of new firms is accelerated. A definitive answer concerning the relation between job creation and size of firm still remains elusive.

We need to understand the impacts of technological change in economic and social terms. Typically, economic benefits are estimated but potential costs ignored. Technological innovation in one area often means technological obsolescence in others. This can affect community tax bases as well as the demand for products of some firms and for skills of some workers.

These research questions represent only a few dimensions of the social science research agenda, yet research in such areas remains severely hampered by the reductions (despite partial restorations) of funds for social, economic, and behavioral science research in NSF and other agencies. The importance of the research questions and needed answers should justify support. The record of performance also warrants it. The value, significance, and yield of basic research in the social and behavioral sciences, concluded a 1982 report of the National Academy of Sciences*, justifies continued public investment as a national resource. Like basic research in physics and engineering, basic social science research is an indispensable part of the effort to achieve and sustain economic growth.—JAMES J. ZUICHES, *Associate Director, Agricultural Experiment Station, College of Agriculture and Life Sciences, Cornell University, Ithaca, New York 14853*

*Committee on Basic Research in the Behavioral and Social Sciences, *Behavioral and Social Science Research: A National Resource* (National Academy Press, Washington, D.C., 1982).