Genetic Engineering: Policy Making in Britain

The Politics of Uncertainty. Regulating Recombinant DNA Research in Britain. DAVID BENNETT, PETER GLASNER, and DAVID TRAVIS. Routledge and Kegan Paul (Methuen), New York, 1986. xii, 218 pp. $35.

The controversy over the hazards of recombinant DNA technology in the 1970's brought into sharp focus the issue of the control of new and powerful forms of technology in the face of widely varying technical opinion about their future impact. Most nations where research involving recombinant DNA was under way responded by establishing systems of voluntary control developed by committees consisting largely if not exclusively of scientific experts. Britain took a different path, choosing to regulate genetic engineering and place policy making in the hands of a broadly constituted committee.

The Politics of Uncertainty by sociologists David Bennett, Peter Glasner, and David Travis examines the development of British policy for genetic engineering, particularly the role played by the principal committees responsible for advising the British government: the Working Party chaired by Lord Ashby, established by the Advisory Board for the Research Councils in 1974 and charged with assessing the potential benefits and hazards of the techniques; the Working Party chaired by Sir Robert Williams, established by the Department of Education and Science in 1975 and charged with advising on the nature of controls; and finally, the Genetic Manipulation Advisory Group (GMAG), established by the Department of Education and Science in December 1976, which was responsible for continuing assessment of possible hazards and for implementation of controls until January 1984, when its remaining responsibilities were transferred to the Health and Safety Executive, the government agency responsible for implementing occupational health and safety regulations.

The principal focus of the book is the establishment and operation of GMAG. The considerations that influenced decisions on the structure and role of GMAG, particularly the differing positions of scientists, who envisaged an advisory committee of experts, and trade union representatives, who pressed for a statutory system of controls with strong representation of employees, are presented in detail. The committee that resulted was a curious political hybrid, the product of compromises on both sides. Formally constituted as an independent body, or QUANGO (quasi-autonomous non-governmental organization), GMAG was run by the Department of Education and Science and had advisory status. On the other hand, GMAG's "advice" had statutory backing in the 1974 Health and Safety at Work Act as well as in regulations requiring notification of the construction of genetically engineered organisms to the Health and Safety Executive. In contrast to the American system of voluntary controls, the British controls applied uniformly to all sectors and were mandatory in practice if not in theory.

Two other features distinguished the British system from its American counterpart and from most other systems established at this time to oversee genetic engineering. First, GMAG was structured as a broadly representative body. In addition to the scientific community, its members represented the universities, trade unions, private industry, and, more ambiguously, the public. Second, local safety committees were required to represent, in the words of GMAG's first report, "all grades of staff and all interests of the laboratory," and trade unions had the right to be involved in their establishment.

Bennett, Glasner, and Travis examine in detail decision making on the issues addressed by GMAG: the criteria to be used by local committees in assessing experiments; the protection of information deemed sensitive by private industry; the introduction in 1979 of a new scheme for reassessing hazards; controls for large-scale production using genetically engineered organisms; the progressive weakening of requirements for containment and oversight; the future of GMAG itself. The task they confronted was not an easy one. The Official Secrets Act, which covers all governmental proceedings in Britain, meant that decision making occurred entirely behind closed doors. Through interviews with civil servants, committee chairmen, and committee members and others closely associated with genetic engineering, the authors were able to see behind British policy as presented in official documents. What emerges is a revealing picture of policy making at the micro level of committee proceedings: the often differing perceptions, positions, and roles of participants; the struggles over such issues as the confidentiality of industrial submissions, use of scientific merit as a criterion in assessment of experiments, and relaxation of controls; the compromises that were ultimately negotiated.

However, the larger picture of the relation between GMAG and the government agencies responsible for it and their socioeconomic context remains unclear. As sociologists working in a research tradition that views scientific knowledge as rooted in a particular time and culture, Bennett, Glasner, and Travis define their goal as examination of social influences on the processes of scientific development (p. 5). Presumably this includes analysis of social influences on the scientific content of policy decisions as well as non-technical aspects of policy.

But this delicate issue is dodged to a great extent. How scientific assessments of recombinant DNA hazards were affected by social and economic pressures is not directly addressed. For example, in 1978, as the United States prepared to dismantle a large part of its recombinant DNA guidelines covering research with *Escherichia coli* K12, it was recognized that if Britain retained its original system for assessment of hazards it would be left "out on a limb" and researchers might well be driven abroad (p. 140). But how the scientific content of the new risk assessment scheme formulated by various subcommittees of GMAG in 1978 was affected by that stark prospect with all it entailed for Britain's fledgling genetic engineering industry is far from clear. The authors conclude, evasively, that the scheme was the outcome of "mainly scientific but partly administrative decisions" and that the "climate was conducive to the reception of a scheme bringing about relaxation, but it was also demanding of one which provided an acceptable, sound scientific basis to any new system" (p. 148).

Two tendencies appear to prevent the authors from taking the analysis further. First, there is a tendency to accept the terms of the genetic engineering debate as defined in the United States by 1978. Although the authors note that some British scientists were skeptical about American moves to dismantle controls, the change in scientific consensus that occurred in the United States in the period 1977 to 1979 is generally taken as given. The reasons for differences in the perceptions of British and American scientists are not pursued, even though there is substantial evidence suggesting that many British scientists took the question of occupational hazards of genetic engineering more seriously than their American col-

leagues, who focused instead on hazards to communities outside the laboratory.

Second, the effects of the growing competition for development of genetic engineering (which from the late 1970's onward was being experienced at every level from the executive offices of government and corporations to the research laboratory) and of the assault on regulation by the Thatcher and Reagan administrations are addressed only fleetingly and ambiguously in this account, as, for example, in references to the "important industrial, medical and agricultural benefits to be gained from the eventual application of genetic manipulation techniques." "Interests" are defined mainly in terms of the immediate commitments of members of GMAG to their reference groups rather than in terms of the larger pressures shaping both the goals of those groups and the behavior of GMAG as a whole.

As a result, a picture of the forces affecting British policy for genetic engineering at the macro level of global competition for the development of new technology remains to be developed. At the micro level, however, this book provides a detailed and valuable account of committee process and decision making and of the effects of a participatory committee structure on policy.

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Science and Entrepreneurialism

Biotechnology. The University-Industrial Complex. MARTIN KENNEY. Yale University Press, New Haven, CT, 1986. xviii, 306 pp., illus. $23.95.

University scientists have played a more pervasive role in biotechnology than they have in any other fledgling industry, according to Martin Kenney. The events and issues associated with this role are presented in a book in which a scholarly study vies for primacy with a populist tract.

The book is divided into two main sections. The first recounts the highly publicized exodus of prominent academic scientists to new biotechnology firms and the signing of long-term research contracts between firms and universities, such as the agreement between Massachusetts General Hospital and Hoechst. The section assesses the issues associated with these developments—the assignment of intellectual property rights; conflicts of interest that arise when faculty conduct research in university laboratories under financial support from firms in which they hold an equity interest; the potential disparity between the mutual benefits that accrue to universities and firms when the "traditional prerogatives and customs of the university . . . can be sold to the highest bidder" and the public interest. The second section, which contains substantially more information not already available to readers of *Science*, describes the genesis and evolution of biotechnology firms, their financial and organizational characteristics, and their "business plans," particularly with respect to the extent to which they will operate as vertically integrated suppliers of both R&D and final products or as contract researchers for established multiproduct firms.

A separate chapter discusses the challenge to the prominence of land-grant colleges of agriculture posed by the emergence of molecular biology as the scientific base from which new agricultural technologies may derive. Private universities and, to a lesser extent, colleges of life sciences within land-grant universities have been the leaders in molecular biology research. This role strengthens the case for a competitive grants program in preference to formula funding of state agricultural experiment stations, a recurrent issue within both Congress and the U.S. Department of Agriculture.

New university-industry relationships are presented as organizational experiments impelled by a relatively inelastic short-run supply schedule for the research expertise needed to realize the commercial possibilities envisioned for biotechnological techniques. A central role is assigned to venture capitalists who have financed the exodus of university researchers into new firms. This exodus is held not only to have precipitated many of the more publicized conflict-of-interest situations (the case of Calgene, for example) but also to have stimulated established chemical and pharmaceutical firms to acquire the services of specific academic researchers. From this perspective, acceptance of long-term research contracts with private firms and changes in internal policies concerning consulting and patents are necessary if universities are to retain faculty who have the option of joining private firms or relocating to "second-tier" institutions willing to enter into agreements less bound by traditional limits.

Kenney's opening thesis, that events in biotechnology represent "the shattering of the ideology of pure science under the impact of economics," may have an element of hyperbole, but it is a point of view that warrants attention, particularly at a time when national, state, and university officials and faculty are moving rapidly to the drumbeat that universities are engines of economic growth. It is possible to present a tightly argued brief for this position, as David Dickson did in *The New Politics of Science*, and indeed as Kenney does in an epilogue. But Kenney obviously is seeking more—a comprehensive study—and in this he fails.

The book is marred by serious scholarly problems. Kenney explicitly rules out any "conspiratorial" theory concerning university-industry relationships. His descriptions show the complexities of and differences among the behaviors and emerging strategies of universities and firms with respect to contractual relationships. The explicit conclusions of his analyses are usually quite open as to long-term outcomes. Yet the tone of his presentation and the manner in which he presents evidence are permeated with both pessimism and mistrust of the parties involved.

Kenney relies heavily on lists to make his arguments. Subversion of pure science is demonstrated, for example, by lists of faculty who hold equity interests in private firms, of individuals who have held professorships and corporate executive positions simultaneously, and of university consultants to specific biotechnology firms. Assertions about evolutionary processes in the life cycle of the biotechnology industry are supported by tables describing the amount of venture capital raised by selected firms and the potential capital gains that result from premiums above initial offer prices.

There are several problems with this approach. From these lists it is never possible to answer basic research questions—how many? how frequent? how important? There are few totals to any list and no denominators at all. Probably not since Charles Beard's *An Economic Interpretation of the Constitution of the United States* has a scholarly study advanced such casual associations among property holdings, values, and behaviors. Table 5.2, for example, identifies 13 individuals from eight universities who have held professorships and corporate executive positions simultaneously. These are not the same individuals involved in the more highly publicized conflict-of-interest situtations nor have they been identified, as is implicit in Kenney's blanket charge, with exploiting or otherwise pressuring graduate students. They represent an unknown fraction of the faculties in their respective institutions and disciplines. Similarly, the data Kenney has compiled on the characteristics of new biotechnology firms (for example, dates and prices of stock offerings) are useful beginnings but, as he notes, provide little basis for predicting the future structure of the biotechnology industry.