in general, and the role that interactions between species play in shaping the specializations they express. Its original and compelling resynthesis of coevolutionary thinking will be of particular interest to evolutionary biologists, ecologists, and population geneticists. Finally, the conceptual framework presented may provide advocates of species conservation and maintenance of biodiversity with a powerful new argument in favor of habitat and ecosystem preservation.

Molecular Politics: Developing American and British Regulatory Policy for Genetic Engineering, 1972-1982

Susan Wright

Chicago: University of Chicago Press, 1994, 591 pp. US$75.00 cloth. ISBN 0-226-91065-2. US$29.95 paper. ISBN 0-226-91066-0. University of Chicago Press, 5801 Ellis Ave., 4th Floor, Chicago, IL 60637, USA.

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At one level, *Molecular Politics* is a history of genetic engineering policymaking and -unmaking, which might be called "the rise and fall of regulation of genetic engineering." At another level, the book is an ambitious and largely successful attempt to combine detailed ethnographic study with the "big picture" of political economy or, in other words, to combine micro and macro analysis of science policy. Such a combination has often been sought but seldom achieved.

The story of genetic engineering policymaking seems straightforward. As capabilities of recombinant DNA technology developed in the early 1970s, a number of scientists became concerned about potential hazards. Their concern led to the imposition of controls on certain types of experiments. Scientific meetings were held and government advisory committees were set up to deal with the issues. In the space of a few years, the primary concern changed from avoiding serious hazards to freeing up research and development for the commercial promise of biotechnology. By the early 1980s, nearly all controls were dismantled.

With this simplistic picture, it would be easy to assume a positivistic stance that sees policy as a reflection of the scientific "facts." Wright rejects this view, noting that a large degree of scientific uncertainty persisted throughout the period, so no particular policy response can be "read off" from the current state of science. Instead, she explains policy through politics, with politics taken in the broad sense of involving the exercise of power.

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There are several ways to approach an analysis of power. A traditional one is to look at social institutions, interest groups, and broad trends in political economy. One of the key groups in this case is the biotechnology industry, which seeks commercial applications and profits. This sort of macro approach has been criticized for not dealing with the complexities of power, such as individual persuasion, conflicts, alliances, routines, rhetoric, beliefs, and the like. Constructivists have developed various approaches to deal with power at the micro level, but usually at the expense of neglecting wider institutional patterns.

Wright confidently combines these two approaches. She begins by sketching the social context of science policy, including the expansion of government funding of science since World War II and the rise of social concerns about the applications of science. Also relevant are the particular interest groups relating to genetic engineering, especially academic scientists and the developing biotechnology industry. She traces the effect of the pressure for "deregulation"—which began in the 1970s and increased in the 1980s—on policy.

This analysis of interest groups and political climate provides the context for a detailed analysis of policymaking, and here is where the book is most impressive. Wright made enormous efforts over many years to find out what happened in key policymaking arenas and events, interviewing numerous key individuals and obtaining primary documents from dozens of archival collections. But the focus is not just on "what happened," but on interpreting key events in the context of the time.

To take one example, the famous conference at Asilomar in February 1975, Wright covers the selection of participants, the affiliations of members of the organizing committee and panels, the framing of the discussion, the key issues covered, and the dissemination of the results. The conference is often seen as unusual in that scientists sought to

prevent problems arising from their research. Wright points to a deeper significance of the conference: its style of discourse set the tenor for future policymaking by assuming that the issues were technical and that the biomedical research community should be centrally involved in decision-making. This particular framing of the results can be understood as reflecting the dominant interests involved, namely elite researchers and industry.

The Asilomar conference was just one event in a long history. Wright analyzes, in illuminating detail, the development of guidelines by the U.S. National Institutes of Health, the setting up and operation of the Genetic Manipulation Advisory Group (GMAG) in Britain, the resistance to and defeat of legislation on recombinant DNA, and the weakening and eventual dismantling of controls on research. Throughout, Wright places her detailed analyses in a wider political context.

The comparison between United States and British policymaking is revealing. Although similar pressures operated in most respects, such as the influence of industry, there was one important difference for part of the period in question. Unlike the U.S. committees, GMAG included trade union representatives of laboratory workers; their presence reflected the greater role of the labor movement in Britain compared to that in the United States (as well as greater concern about industrial hazards in particular). As a result, for the period 1976-1978, policy in Britain differed from that in the United States. But after 1978, deregulatory pressures and concerns about international competitiveness overcame reservations by British trade union representatives, and British and United States policy again became similar.

Wright's impressive achievement is to show in both convincing detail and broad sweep that science policy can be analyzed in terms of power at both the macro and micro levels, and to show how these two levels can be linked, if not fully integrated. The case study here is genetic engineering, but similar studies could be made in other areas. So far, though, none have been undertaken. One reason is that the work required is enormous. Wright's study is a mammoth scholarly effort, culminating some two decades of investigation.

Exemplifying the book itself, the title, Molecular Politics, can be read at two levels. In a straightforward sense, it is a political history of molecular biology and genetic engineering. At a more theoretical level, though, it is a combination of micro ("molecular") social analysis and macro social analysis ("politics").

The book is well written and has an exceptionally clear structure. Nevertheless, with its wealth of detail and large-scale picture, it is not for the casual reader.

No doubt some can find limitations, especially in the articulation of theory. This is to be expected, given that meshing a "post-pluralist" analysis of interests with a Foucault-inspired concern for discourse as power is bound to give rise to some theoretical incompatibilities and difficulties of application. This should not detract from the brilliant execution of the study. This volume is one of the outstanding books in the social analysis of science in recent years.

The Major Transitions in Evolution

John Maynard Smith and Eors Szathmary

New York: W. H. Freeman and Company, 1995, 346 pp. US$29.95 paper. ISBN 0-7167-4525-9. W. H. Freeman and Company, 41 Madison Ave., E. 26th, 35th Floor, New York, NY 10010, USA.

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Whether this book will rank among the classics of evolutionary biology remains to be seen. That it is a candidate for the honor derives most obviously from the fact that it is a statement about the "big picture" coauthored late in his career by John Maynard Smith, one of the most accomplished and influential evolutionary biologists of our time. Eors Szathmary, while younger, has amassed a substantial body of mathematically and chemically sophisticated theoretical research on evolutionary topics, including the genetic code. In the authors' words, "this book is about the origin of life, of the genetic code, of cells, of sex, of multicellular organisms, of societies, and of language" (p. xiii).

The origin of life is covered in four chapters (one each on the definition of life, chemical evolution, templates, and the chicken and egg problem); cells in two chapters (on protocells and eukaryotes); and multicellularity in four chapters (on simple organisms, gene regulation and cell heredity, spatial patterns, and development and evolution). The code (between life and cells), sex (between cells and

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