

anti-war movements, sought to combine radical political activism with work in the professions. Rather than seek high income or status, they sought to "serve the people" through work with the poor and disenfranchised, and some even sought to challenge the dominance their professional organizations and institutions held in the community.

Can there be a radical professionalism and can professionals successfully organize for social change? These are the questions addressed in Lily M. Hoffman's fascinating study of activist doctors and social planners in the 1960s and '70s. Hoffman explores an issue rarely probed by social scientists: to what extent can the expertise of professionalism be harnessed to social change, and to what degree can professions be linked to activist movements while maintaining their legitimacy in American society?

Hoffman's ambitious book is based on interviews with representatives of 19 different activist groups that arose in the 1960s and '70s. These are a diverse lot, encompassing organizations of students and young professionals that sought to extend services to minorities and the poor (Urban Field Service and the Student Health Organization); activist trade unions and worker collectives in the professions (the Committee of Interns and Residents, the Lincoln Hospital Collective, the New York City Technical Guild of engineers, planners, and architects); and radical networks of journals and study groups that sought to challenge the dominant paradigms of the professions (such as the Health Policy Advisory Center, known as Health PAC, and the East Coast Health Discussion Group). Hoffman provides, for the first time, a comprehensive analysis of these many groups, their achievements and disappointments, based on candid interview material.

Hoffman organizes the book around four different strategies of social change adopted by activist professionals: "Service delivery," in which groups of professionals sought to serve low-income and minority communities directly; "empowerment," in which activist doctors and planners sought to help communities organize themselves; "professionals as workers," in which radical professionals came to view their own role as employees as critical to social change and hence formed worker collectives and unions; and "transforming society," in which some radical professionals came to believe that they could serve as a vanguard in a revolutionary transformation. Though Hoffman does not clarify this point, the first two roles are associated more with the 1960s, whereas the latter two became more prominent in the '70s.

Generally, though there is much in the

book that is sympathetic to the efforts of radical professionals, Hoffman's conclusions are pessimistic, and she spends a great deal of time analyzing the failures of radical professionalism. Hoffman concludes that the very basis of professional legitimacy—expertise—strongly limits successful activism because as radical doctors and planners came to challenge their own technical roles (arguing they were political and intimately related to social class and political elites), they lost legitimacy with the public (which after all is interested in narrower issues such as the distribution of medical care). An interesting subtheme of the book, which could have been more explored, is that the federal government, in seeking to limit the power of professionals (particularly physicians) for its own reasons, may have paradoxically co-opted parts of the radicals' own critique to limit professional autonomy.

Hoffman's account is weakened by a few technical and theoretical problems. Owing to the choice of medicine and planning as professions to study, the reader is jolted back and forth between two very different sets of problems and concerns. Hoffman notes that she selected these professions on the basis of these differences, but I am not sure that the choice was fruitful enough theoretically to justify the awkwardness.

On a more substantive note, Hoffman's theoretical conclusion (that radical professionals are "constrained by their occupations") is a truism that tells us less from a sociological perspective than it first appears to. After all, most people are constrained by their occupational roles when it comes to supporting militant social action. Given the decline of 1960s radical movements generally that occurred with the advent of a more conservative period, the book does not adequately make clear in what sense professionals are more constrained than automobile workers, welfare recipients, or the homeless in implementing a radical agenda. Yet the point of such a study should be exactly that—did radical doctors or planners fail in their objectives more than other groups in society, and if so why?

This problem in the book may stem from the fact that Hoffman's study does not adequately distinguish between groups that were essentially liberal in their political ideology and those that were socialist or Marxist. I would suggest that the more liberal goals of the 1960s activists involved in groups like the Student Health Organization or Urban Field Service (increased service to the poor and Third World communities, increased professional accountability, changed curricula in many professional schools) had to some degree been met by the 1970s. In contrast, the most radical

objectives of activist groups like Health PAC or the Lincoln Collective for worker and community control or "barefoot doctors" have faded into the past. The key point, then, is not to demonstrate the existence of "limits of professional activism" but to define where these limits are (or were in the last two decades).

Finally, despite a great deal of theoretical review, Hoffman does not directly give us her view about a key issue implicit in a "radical professional" movement. No one disputes that some professionals do become politically radical, but are political goals best expressed through work life? For example, many physicians throughout the world have become actively involved in politics: on the Left, one thinks of Salvador Allende in Chile and Che Guevara in Cuba, both of whom entered politics directly rather than becoming part of a radical physician movement. The unique feature of the American "radicals in the professions" movement of the past three decades was the attempt to implement radical politics through efforts to change medical care or social work or legal practice. Were American leftists mistaken in taking their occupations as the major arena of political effort rather than joining more generalized political battles? This is a question I wish Hoffman had addressed.

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A Transition in Biology

The Mendelian Revolution. The Emergence of Hereditarian Concepts in Modern Science and Society. PETER J. BOWLER. Johns Hopkins University Press, Baltimore, 1989. viii, 207 pp. \$29.95.

During the last 15 years historians of the life sciences have been revising the textbook story of the rise of genetics. Much of this revision has focused on Mendel's achievements, on the period of the rediscovery of Mendel's laws, and on the scientific context in which other 19th-century investigators of "heredity" explored not only the hybridization process but other phenomena associated with reproduction, development, and transmutation. As a consequence, familiar figures, such as Gärtner, Nägeli, Darwin, Spencer, and Haeckel, are seen as students of generation or development rather than of transmission. Even Mendel, an anomaly in the traditional story, turns out to be more interested in testing whether hybridization could produce new species than in isolating the mechanism of transmission. "Generation

theories," to borrow Jonathan Hodge's expression, dominated 19th-century discussions of heredity.

Such a reappraisal of the 19th century has forced a readjustment in our understanding of the rise and goals of early 20th-century genetics. There now appears to exist a more profound intellectual divide between these eras of biology than was formerly allowed. The historical focus has shifted from the specifics of the "rediscovery" year of 1900 to the broader trends in the transition period between 1880 and 1910 when a hereditarian mindset superseded a developmental one and when genetics separated from embryology and evolution as a distinct field of study. The transition, however, was uneven, and different countries responded in different ways to the advent of nuclear cytology, Mendelism, and classical genetics. American and, to a lesser extent, English geneticists focused on the implications of the chromosomal theory of heredity. German investigators, more chary of a "Kernmonopol," pursued a more integrative approach, and French biologists pretty much ignored classical genetics. These national differences, particularly, have provided historians an opportunity to examine the interplay between scientific programs and theories and social concerns and expectations. Hodge, Robert Olby, John Farley, Jan Sapp, Garland Allen, Jane Maienschein, and this reviewer, among others, have each in his or her way developed particular aspects of this revised story.

Peter Bowler is interested in broadcasting the results of this scholarship in general terms that will be easily understood by the nonspecialist. He readily admits that this is not his area of historical research and that all he intends is a tertiary account. He has performed the task of summary and popularization in a comprehensive way, and he demonstrates a solid, though not complete, grasp of the Anglo-American secondary literature. His book provides a readable introduction to the changes in formal theories of heredity that captures the essence of what the specialists have been working toward. Bowler also presents a much-needed discussion contrasting social Darwinism and the eugenics movement. As a source of reference to the secondary literature the work will be useful.

Perhaps because it is wholly derivative, however, the book fails to provide a sense of the nuts and bolts of the scientific research. Biologists during the 19th and early 20th century, above all, possessed a deep familiarity with living organisms, with the diversity in organic forms, and with the complexities of the processes perpetuating life. Without some grounding in this fascinating world or some account of the particulars of nuclear

cytology and the calculus of hybridization, the contrast drawn between the generation theories of the 19th century and the hereditarian theories of the 20th century appears formal and superficial.

Where he does introduce biological particulars, Bowler sometimes confuses rather than elucidates the details. Thus he describes meiosis as a "quadruple cell division" (p. 86); he confounds Mendel's law of independent assortment with the law of segregation (pp. 101–102); and he writes six pages on the rise of population genetics without a word about the Hardy-Weinberg equilibrium principle (pp. 138–143). More confusing yet, Bowler identifies the 19th-century attitude toward heredity with the phenomenon of "growth," as though generation or development were the same process as an extension of size. This conflation of two quite different phenomena obfuscates the fact that the 19th century sought to understand the generation of new form, not the extension of existent form. By substituting "growth" for "development," Bowler corners himself into writing some comical phrases, as in his references to Wilhelm Roux's "mosaic theory of growth" (p. 79) and Hans Spemann's concept of "an organizer field to coordinate growth" (p. 148).

Bowler, however, is more interested in generalities than details, and he prefers exploring another level of historical explanation. He draws upon the recent trend in the history of science to invoke political and social forces as the primary shapers of scientific theories. To his credit Bowler is at most a cautious "social constructionist," who levels some perceptive criticisms at the "strong programme," as today's jargon has it. Nevertheless he peppers the reader with provocative assertions, most of which he fails to follow up with demonstration or refutation. Thus he suggests that the modern dominance of genetics and evolution theory is "a product of professional and ideological decisions" (p. 146), that classical genetics was an "artificial construct of American and British science" (p. 152), and that "early Mendelians redefined the concept of heredity to focus attention on the problems that they alone had the techniques to solve" (p. 153). Now, I do not quarrel with Bowler for reporting these claims (whether he accepts them or not), nor do I object to social constructionists for "exposing" the institutional politics and social ideologies in science. I have no doubt that both factors operate here as in all other spheres of human activity. They do not, however, define the limits of human aspirations. The challenge, which has been rarely met and in this book is casually ignored, is to show in a precise way how politics and ideology interact with un-

expected "factual observations" to construct in a step-by-step manner a particular scientific theory. Vague correlations, innuendos, and bold assertions simply will not do—even in a tertiary text.

A quotation on the dust jacket will reveal that I am an admirer of some of Bowler's previous books. This one, however, fails to live up to earlier standards.

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Underrepresentations

Blacks, Science, and American Education.

WILLIE PEARSON, JR., and H. KENNETH BECHTEL, Eds. Rutgers University Press, New Brunswick, NJ, 1989. xxii, 174 pp., illus. \$35.

That blacks are underrepresented in the study and practice of science (and engineering) in the United States is well documented. Blacks constitute 12% of the population but only 7% of undergraduates majoring in science and engineering, 2% of graduate students in these fields, and 2% of employed scientists and engineers. This book is devoted to exploring the historical and current causes of this underrepresentation. In seven chapters the accumulated evidence on the status of black science students and black scientists and engineers is ably and usefully summarized.

Following a gracious foreword by Walter Massey, former president of the American Association for the Advancement of Science, in which the contribution of Shirley Malcom to the advancement of minorities in science is highlighted, the history of blacks in American science is briefly recapitulated. Then, beginning with high school and proceeding to professional employment, successive chapters describe the evidence that may help to explain the underrepresentation of blacks in science and engineering. In the final chapters, strategies for increasing the participation of blacks are discussed.

If the book has a problem it is that the confidence with which the authors draw conclusions is not always supported by the data. Phrases such as "this proves," "it is clear," and "the only factors" occasionally leave one wishing for more data or more consideration of competing hypotheses. For example, federally funded intervention projects are credited with increasing the test scores of black students although the only evidence cited is that the two events (onset of funds and rising scores) tended to coincide.

The book is intended to be a data-based