

recognition that there is, after all, only one human genome and one science by which all life must be studied may prove to be at least as powerful in changing assumptions. Like the other recent advances in science, it makes the pursuit of antagonistic national and sub-national aspirations seem altogether obsolete. I wonder if that is not the long-term message of Wiegele's seemingly modest proposal.

References

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Review of Thomas C. Wiegele, *Biotechnology and International Relations: the Political Dimensions*

Nexus for the Twenty-First Century

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For a biological scientist like myself, it is interesting and informative to read a book that deals in a scholarly way with some aspect of science (in this case, biotechnology) but that is intended primarily for non-scientists (in this case, scholars of international relations).

The intentions of this book are laudable, indeed. The author wants to make a case for the inclusion of biotechnology, particularly its social implications, in the study of contemporary international relations. To do this, he organized the book around what I am assuming are subjects covered in any standard international relations text: international law, commerce, and conflict. He then tried to articulate the role of biotechnology in these areas.

Unfortunately, the author has chosen to restrict his definition of "biotechnology" to recombinant DNA (rDNA) technologies (genetic engineering) only. There is only a short reference (p. 27) to other important biotechnologies, such as hybridoma production and protoplast fusion. In my view, the issues that surround the use of these technologies and the implications for international relations are different enough from rDNA technology to warrant a separate discussion. For example, the author spends much of the book discussing the impact of environmental release of genetically engineered organisms. This is not really an issue with either hybridomas or fused protoplasts. Certainly there are issues unique to these biotechnologies that should have been included.

The book vastly overstates (and thus spends far too much time on) the issues and the impact of the release of genetically engineered organisms. I disagree strongly with the author's contention (p. 29) that most of the key policy issues in biotechnology, including environmental release and ecological impacts, were "unanticipated by the scientific community." In fact, it was the scientists

who created the modern rDNA technology who first raised among themselves the issues that led to the watershed conference at Asilomar, the National Institutes of Health Recombinant DNA Advisory Committee, and the current regulations governing the use and release of genetically engineered organisms. Further, the author seems to contradict himself with the discussion (p. 59 and following) which clearly established the scientists themselves as in the forefront of the policy debate over rDNA in those early years.

The book does a creditable job of explaining the basics of rDNA technology for the scholar of international relations without a background in molecular biology, though I would have preferred an even more detailed discussion of rDNA and a substantive scientific explanation of both hybridoma and protoplast fusion technologies. There is also a wealth of interesting and useful information on various international legal instruments and conventions that might affect or be affected by biotechnology. In this regard, the author devotes a great deal of time to a discussion of intellectual property and the major decision (*Diamond v. Chakrabarty*) that provided the fundamental underpinning for protection of intellectual property associated with biotechnology. The ensuing discussion (p. 87) of international treaties regarding patents is useful and germane and relates well to the later discussion of biotechnology and international commerce in the Third World.

The closing chapter is, for me, the most difficult to evaluate. The author does a great service for his discipline (political science) and for interdisciplinary studies generally with his thoughtful discussion on educating international relations scholars (p. 169). But this discussion is based on an extremely questionable premise: that "scholars of international relations, without a direct interest in the progress of biotechnology, ought to be able to lend a considerable amount of objectivity to such studies." (In this context, "studies" refers to social impacts of biotechnology.) There is certainly no evidence

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that scholars of international relations are any more objective than any other scientist. In fact, I could make a persuasive argument that just the opposite is true—but then my bias might show, so I won't.

The author states that "biotechnology is too important to be left any longer to the biological scientists." He argues that the study of the social implications of biotechnology needs a theoretical underpinning; that the present state of knowledge about the international political dimensions of biotechnology is not encouraging; and that, without this work, ideological rigidities may soon have too strong a hold on the dialogue. Unfortunately, the author has greatly overrated both the tenor

and the vehemence of the continuing public and scientific debate on the use of biological technologies.

The intentions of this book are laudable. The author has succeeded in establishing a correlation between biotechnology and many aspects of international relations. I cannot say that he has done this in a way that will ultimately prove useful to scholars in either political or natural science. I note that the author identified a number of research tasks for the future that flow from the study of the social implications of biotechnology. It is unfortunate that the author did not address more of these issues in this book. That would have been a more significant contribution to the debate.