contributors had quite a bit of fun putting this volume together. One is struck by the impression of an exchange that is less like a conference of experts, and more like the neighborhood pub where the experts have decided to carry on their intense discussions once the meetings are ended. Eavesdropping on these discussions, quite a bit of useful information is available.

My only quibble (and it really is only a quibble), is that all of the contributors buy without question the premise that the only rational response to global change is global cooperation. Certainly this is true in an ideal world, and when one has the luxury to prevent future change. But I am not yet convinced that, with the exception of scale, the situation is entirely without precedent --any navigation treaty of the eighteenth century had the same immediacy and requirements for international cooperation--or that any other than lukewarm (politically, not climatologically) coordination is feasible, given the nature of global politics. (This review is being written on the eve of the Kyoto Summit on global climate change, which gives every indication of being a disappointment.) People have *always* lived beyond the local carrying capacity (witness Los Angeles, the Sahara rim, and deltaic Bangladesh)--the rich survive and the poor don't. Recent attempts at global cooperation do not provide much hope that the immediate future will be any different.

Despite this unexamined premise, the volume is a thoughtful, well-(and playfully) organized reference that will be of value for anyone interested in the painful, critical dialog between the science of global environmental change and the institutions entrusted with a response.

Jane Rissler and Margaret Mellon. *The Ecological Risks of Engineered Crops.* Cambridge, MA: The MIT Press. 1996. xii + 168 pp.

Reviewed by E. Paul Durrenberger, Department of Anthropology, Pennsylvania State University

New genetic engineering technologies allow the implantation of genetic material into plants, presenting the possibility of twin problems. The engineered plants may be better able to persist, invade new habitats, and become weeds. Secondly, pollen may transfer new genetic material to related plants, changing and perhaps eradicating certain useful species. Both processes threaten the diversity of plant forms that are useful for breeding agricultural crops by conventional means.

“Weeds,” plants in places they are not wanted, may be created by either process. If they are hearty, they could cause cascading effects and modify whole ecosystems. In a hypothetical discussion, the authors point out the dangers of a plant with insecticidal qualities that could unselectively harm insects beyond the target group, affect soil microorganisms and earthworms, with unanticipated negative consequences. Rissler and Mellon discuss various examples of unpredicted side effects of plants like kudzu that have become weeds. There is a detailed and technical discussion on the topic of “weediness,” and the authors eschew any simple list of traits that may be used to define a simple characteristic of weediness.

They suggest that current controls on the production, marketing, and use of transgenetic plants are insufficient to prevent such ecological catastrophes. They propose an alternative scheme, one that rests on a process of assessment of new candidates in terms of

existing knowledge and experimental work. "The fundamental question addressed by the testing scheme is whether the addition of transgenes to crop plants by genetic engineering techniques or to wild/weedy plants by gene flow changes these plants into weeds" (p. 108). If there are strong reasons that the candidate would be less rather than more viable, or if there are other reasons that it would not become a weed, then it would pass. If plants could not be passed on the basis of current knowledge, then field experiments should determine how long the seed remains viable, and how many seeds the plants would produce. Seeds with longer viablity or greater seed produciton pose more of a threat.

These testing procedures become more salient as the authors remind us that remediation up to the point of eradication is virtually impossible, and that postrelease monitoring is not a practical means for controlling risks of commercial-scale uses of crops. The potential problems become exponentially more serious when the authors remind us that "a global seed trade means global risks" (p. 111), and that the wild plants in centers of crop diversity are the genetic basis of the world's future food supply. The authors remind us that the problem is even more crucial because variablity in centers of diversity is disappearing because of habitat destruction and green revolution monocrops replacing traditionally diverse crop varieties.

They advise that because the U.S. plays a leading role in the development of transgenic crops, the U.S. should initiate efforts to protect plant diversity.

That's the down-side. Where's the up-side? Perhaps genetically engineered crops will end world hunger? Not a chance. These crops are developed for herbicide tolerance (the most popular), pest resistance (second), and processing and transportation qualities—e.g., high solids like tomatoes and potatoes — and longer shelf life — e.g., everlasting tomatoes, bananas, and pineapples. The authors say, laconically, "to date, improving the nutritional value of food does not appear to have received as much emphasis as shelf life and processing traits" (p.18). In short, "biotechnology fits comfortably into modern food systems that emphasize food processing, consumer niche markets, and production efficiency" (p. 18) where agriculture is already highly productive and where hunger has nothing to do with production shortages. Virtually all such crops are aimed at the prosperous farmers of the North. Furthermore, increased production is not a major factor in world hunger, and transgenic crops will "not compensate for decades of environmental abuse, misguided agricultural policies, and income disparities."

The authors argue that biotechnology should be evaluated in terms of contributions to agricultural sustainability, not in terms of the causes of the problems — intensive monoculture that relies on synthetic inputs and a large arsenal of poisons. Most applications of biotechnology are meant to contribute to this system. Small wonder. In Table 2.3, "Applicants to the U.S. Department of Agriculture to field test transgenic crops," we see that 46% of the applications are from chemical companies such as Monsanto, Upjohn, DuPont, Sandoz (Northrup King and Rogers NK Seed), and Ciba-Geigy. Seventeen percent are from Universities and the U.S. Department of Agriculture. Fifteen percent are from seed companies—Pioneer Hi-Bred, DeKalb Plant Genetics, and Holden's Foundation Seed among others. Forty percent of the applications are for herbicide-resistant crops that encourage the use of the products of the chemical companies that develop the crops.

Most of the book accepts the assumption that transgenic development will continue, and the authors outline ways to contain the genie, if not keep it in the bottle. One wishes they had taken the step backwards they seem to contemplate in their introduction to contextualize the discussion, offering a critique of industrial agriculture that links government departments, universities, and corporations into networks of reciprocity and cooperation to the detriment of sustainable agriculture. A program for sustainable agriculture would "support research that studies soil, water, climate, crops, animals, pests, and wildlife on a farm as an interrelated whole" (p. 21). But in industrial agriculture, "farm" ceases to be a meaningful category. The relevant system, as this book shows, includes markets, technol-

ogy, and other resources, not farms. In spite of the authors' awareness of the importance of policy — the book is, after all, an attempt to affect policy to get some sort of risk analysis and testing adopted — there is no critique of the policy matrix that encourages and maintains the industrial agricultural system of which transgeic development is a part.

The three-tiered system of testing Rissler and Mellon propose as a solution may be a palliative. But one wonders why, having lucidly pointed out the problems that genetic engineering of crops indicate and entail, they did not offer a more systemic critique and more appropriate solutions than a testing protocol that would, if adopted, function more as a nuisance to corporations with products to market than as a corrective for the ills that Rissler and Mellon so accurately document.

David Pepper 1996 *Modern Environmentalism: An Introduction* , viii, 376 pp., figures, tables, glossary. London and New York: Routledge.

Reviewed by Adrian Peace, Department of Anthropology, University of Adelaide, Adelaide, South Australia

Ever since its initial publication in 1984, David Pepper's *The Roots of Modern Environmentalism* has been an indispensable text for any student of environmental issues in postmodern society. Thirteen years on, it is difficult to capture the intellectual excitement that reading that book generated. It so obviously stood head and shoulders above all other attempts to draw together the diverse historical and philosophical influences that made environmentalism one of the most potent political discourses of the late 1970s and early 1980s. Pepper was especially astute in detailing the influence of Marxist and neo-Marxist thought on environmental ideas, a concern substantially understated since then. But it was the scope of the text as a whole that caught the reader's imagination and encouraged her or him to become further immersed in the wide-ranging literature upon which the author had skilfully drawn.

As Pepper points out in the opening pages to *Modern Environmentalism: An introduction*, there has been an exponential outpouring of social science literature on environmental issues since the mid-1980s. His new book constitutes a major revision of Chapters 1 to 5 of *The Roots of Modern Environmentalism* in the light of this more recent literature; only a brief glance at the bibliography drives home how extensive it is. Yet *Modern Environmentalism: An introduction* displays the same impressive command of source materials, the same even-handed appreciation of radically divergent ways of interpreting the relation between nature and society, and the same clarity of expression when dealing with awkward technical arguments, most especially those postmodern scientific ones that have entered the marketplace of ideas over the past decade or so. Pepper writes that his book is "basically an anatomy and history of the ideas about nature and environment that appear in modern environmentalism, both reformist ('technocratic') and radical ('ecocentric')" (p. 7.) It is about as balanced and sober an assessment as is possible, considering the strong reaction that ideas from one political camp are likely to provoke nowadays within the ranks of the other.

Chapter 1 is entitled "Defining Environmentalism," and it more or less opens with an extended table that distinguishes between green values and conventional ones on such topics as nature, humans, science and technology, production and economics, and politics. Pepper uses tabular presentations extensively throughout this text, and they are to be nei-