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The Environment: Collateral Victim and Tool of War

ROBERT JARRETT

I make two assumptions in this article: First, that a few *BioScience* readers, but not many, will have had some involvement with the ecology of war and will want to know more about the current literature; and second, that some readers, perhaps many, may be interested in becoming active in this field. So this article has two facets: (1) a quick introduction for the uninitiated to the field of impacts of war and (2) a description of the books under review. My aim is to tell you whether these books will help you understand what war does to the environment.

A Google search on “war and ecology” netted 448,000 hits in just 0.17 seconds on 21 July 2003. An unscientific, visual sample suggested that the offerings range from the rational to the ridiculous, from the fact-based to the facile. The vast majority are short articles. It is far beyond the scope of this review to do a bibliometric analysis of these results; it is possible that a few facts and ideas are repeated with a high frequency, vastly outweighing the generation of genuinely valuable information. No doubt excellent material is buried in the avalanche. In my own work, I noticed that this past April and May brought a surge of articles reporting on the intent of nongovernmental organizations and the United Nations to conduct research and mitigation projects in the marsh areas of Iraq. Books and monographs on that work are likely to appear in the coming months and years.

Before the Vietnam War, with its defoliation and dioxin dispersal, few people discussed ecological destruction by warfare. It was generally accepted as a necessary evil of a necessary evil. Taking that as a graphical 0,0 point and moving forward to today, we see a definite rise in the trend line of concern over war's environmental effects. Since the Persian Gulf War in 1991, increasing recognition of the ecological footprint of conflict has joined with other rising concerns about the global environment. We look for help in grasping the nature and intensity of the effects of war to aid the development of appropriate ethics and policy. It was possible in 1996 for me to tell the Federal Forecasters' Conference, an annual meeting of statistical and normative forecasting specialists from most of the prominent US government agencies, about a discernible worldwide trend toward inclusion of such issues in future decisionmaking on whether and when to go to war and when to

terminate war. Four years later, two books were published on that trend of thought (Austin and Bruch 2000, Hastings 2000). Today, 7 years after the conference, concern and discussion about the ecological effects of war are even more widespread.

It will help to quickly consider a few fundamentals before turning to the merits of some recent literature for addressing those questions and desires. Human conflict generates two broad categories of eco-consumption. First, there is the continuous, nonbattlefield use of minerals, forests, and food to support the peacetime and wartime production of matériel and military training (also to be read as production of pollution and damage to air, habitat, soil, and water). Scientists have been analyzing such consumption and the consequent environmental degradation for decades. Information and understanding are slowly accumulating for these parallels to the measure of ecological damage caused by peaceful living. That knowledge is not complete and the ecological costs are not fully internalized into activities and products, but awareness and understanding of the magnitude of the problem are growing. Second, there are the obvious, noisy, messy, destructive battlefield effects of war that appear in the images beamed to homes around the world. Battle damage experts assess *military* effects, but they do not provide or retain detailed biophysical data for scientific study. The news pictures show startling damage, but they fail to show the vast amount of territory that has not been churned beyond recognition. They also fail to show the long-lasting, subtle effects of war on the environment.

Recent conflicts, while providing “laboratories” for evaluating damages (intentional and collateral), may not be providing information to help economists internalize the ecological damage of conflict into national budgets. Are such opportunities being forfeited? Battlefields are too dangerous

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for immediate assessment, and research grants typically become available long after natural mitigation has begun. Therefore, the biological scientist who wants to research the ecological impacts of human conflict will not find a huge literature in this field. Nevertheless, we can evaluate three recent sources of thought and information on the subject.

As with so many other topics, the literature in this field seems to come in waves, both in terms of the amount written at a given time and in terms of its emphasis. Thus, scientists and researchers are not necessarily going to find an even evolution of thought. *Ecology of War and Peace: Counting Costs of Conflict* (2000), by Tom Hastings, and *The Environmental Consequences of War: Legal, Economic, and Scientific Perspectives* (2000), edited by Jay Austin and Carl Bruch, have the same year of publication, meaning that the content of both is probably of a similar age—allowing for the processes of research, peer review, and publishing, most likely four to five years old. Yet these are relatively new books in the genre. A third source of recent information on the ecology of war is the series of studies issued over several years by the United Nations Environment Programme (UNEP) Post Conflict Assessment Unit (UNEP PCAU 1999–2003). A few narrowly focused technical reports are also beginning to appear about the ecological effects resulting from warfare in Southeast Asia 25 to 40 years ago.

Ecology of War and Peace is easy to review. In his preface, the author admits his subjectivity. If you are looking for ecological information organized with just the modicum of normative discussion needed to correlate conflict with its ecological footprint, you will be disappointed. This is not your book. Hastings applies the word *ecology* in a philosophical, ideological vein to provide a highly judgmental discussion with a smattering of technical quotations. He is not so much pro-ecology as he is antiwar. Read the preface and pages xiii and xiv. If you like them—they describe his view that war is bad and his many years of protest activity—and if you are looking for pacifist arguments and companionship in that area, this is your book. If you disagree with those few pages, you will hate the book. If you are an agnostic in these matters, you will need to read a lot of other books to get a balanced picture, since Hastings does not always maintain his journalistic objectivity. Fortunately, he does provide sources at the ends of chapters (weighted toward the normative rather than the scientific), a bibliography, and an index.

When reading *Ecology of War and Peace*, be alert for anomalies and wary of logical pitfalls that can seriously mislead the untutored. These pitfalls are exemplified by Hastings's use of the term *commonsense epidemiology* when discussing cancer occurrence (pp. 18–19) and his confusion of the phenomena

of toxicity and radioactivity (p. 31). Nevertheless, Hastings raises many interesting issues that any student in this field might wish to confront. Toward the end of the book, he abruptly inserts a discussion of “environmental justice” (pp. 116–117), an important concept but one that is tangential to his previous directions. The final, short chapter, “Constructive Conflict,” shows why Hastings's ecological and environmental material has been watery and assertion laden all along by closing the loop with the preface: He proves that his passion and knowledge base are truly antiwar, not ecological or environmental.

As Hastings researched and wrote his book, other activities transpired of which he could take only partial or no advantage. One was the continuation of the series of UNEP studies of the impacts of war in the Balkans. The other was a conference in 1998 sponsored by the Environmental Law Institute, the Smithsonian Institution, and the Kuwait Foundation for the Advancement of Sciences. That conference produced a compilation of scholarly papers, *The Environmental Consequences of War*, which provides an interesting

Along the way, the various authors admit to such realities as humans' continuing unwillingness to forgo war as a means of dispute resolution (much less forgo all harm to the environment), the practical impossibility of rapidly assessing damage in active war zones, legal differences between international and intranational wars, and the paucity of ecological data and standards for valuing damage and mitigation.

counterpoint to Hastings's views. In developing chapters for this book, the editor—authors Austin and Bruch had the advantage of having access to papers presented by 33 additional authors who were selected by well-known organizations to present papers at the conference. The book's coverage of issue areas and opinions within the total institutional and natural context of environment and war is thus quite wide, affording the reader a broad education on

questions in the field and possible approaches to their resolution.

This volume does not provide encyclopedic reference information on the field of war and the environment. It does provide far more technical information than the Hastings volume, although its 172-page part III, which addresses environmental and health impacts, is still at too high a level of abstraction to be more than a general survey of conditions and concerns. Austin and Bruch's compendium of articles walks the reader through the concepts (and some quantifications) of historical and cultural developments in the law of war and peace, assessment of ecological and health impacts, valuing of ecological and health impacts, and prospects for future developments.

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(Austin and Bruch, p. 314) threatens to raise what could be a firestorm of indignation, or guilt, among scientists when he accuses the scientific community of lacking sufficient interest in measuring the effects of war. On previous pages, he accuses existing impact assessment methodologies of not being rigorous enough to do the job—presumably even if good data were available.

Where does that leave us? Austin and Bruch and their contributors give us an excellent overview of questions and hint at possible eventual answers to be struggled with, in tandem with evolution in other institutional spheres. To be sure, they have not avoided all ideology: They do assume that environmental protection is good. Nevertheless, the authors express that idea with considerable objectivity. Their writing is well organized and clear. They throw down the gauntlet to scientists and policymakers alike to develop and implement disciplined ecological damage evaluation and mitigation programs that are better scaled to the wars themselves. The text is well footnoted and indexed for ease of use.

The Environmental Consequences of War is a book to be read by anyone contemplating a major project or a career in war-associated ecology research or mitigation. It provides a broad, clear picture of the playing field—what can be influenced and where efforts will fit. Austin and Bruch and their colleagues do not significantly advance readers' knowledge of the science in this field, but they do give a critical boost to clarifying its purpose and goals against the backdrop of legal, geopolitical, and behavioral realities. This clarification, in turn, may help scientists locate research sites and financial and technical support. Scientists and engineers are often “damned if they do and damned if they don't” become knowledgeable and involved in the politics and economics of their field. We can't seem to win! Still, erring on the side of greater understanding should go far toward ensuring career satisfaction. The bias of pro-environment subjectivism is of little consequence compared with the wide range of information and ideas the authors offer a reader to draw upon for building one's own program.

Given the time lapsed since its publication, it is time for a sequel to Austin and Bruch; let us hope it is already in preparation.

The UNEP reports fit a special niche, addressing particular concerns in a detail that neither Hastings nor Austin and Bruch can provide. These reports typically carry titles with the words “post-conflict environmental assessment” or “consequences for the environment.” They focus on specific nations, areas, conflicts, and even weapons (one considered the effects of depleted uranium rounds). The series starts with the Persian Gulf War of 1991, continues through the various

Balkan regional conflicts of the 1990s, moves to the war in Afghanistan, and ends with the “desk study” for the 2003 conflict in Iraq. Small, highly competent staffs were deployed for short periods to perform the field studies. A hallmark of the reports has been their low level of scientific data content and high level of policy interpretation, accompanied by projections of program needs for mitigation development. Though the reports are not scientific monographs, presumably the data do exist for further study and augmentation by qualified scholars.

Both the books and the UNEP reports under review have one thing in common: The titles imply that the reader will indeed find detailed environmental information in them. However, that is true of all three to only a modest extent. Such titles could mislead the general public and political leaders into believing that we know more than we do and that vast volumes of longitudinal ecological

data exist for ready analysis. Fulfilling Austin and Bruch's and UNEP's recommendations for information generation would be a fitting way to solve this problem: by producing properly titled books, journals, monographs, and databases of pre-, concurrent, and postwar ecological information.

It is intriguing to compare the books by Hastings and Austin and Bruch. Clearly, Austin and Bruch's book is more measured in tone and more topically thorough than Hastings's work. At root, Hastings aims for an emotional response, whereas Austin and Bruch lay out situations and alternatives. Nonetheless, Hastings deserves credit for identifying the same basic list of principal environmental harms derived from war that Austin and Bruch did. Both books raise similar issues of policy concerning resources for science and mitigation, as well as forbearance during hostilities. They agree that the human power to destroy is growing, and they agree that a sentiment is growing in favor of controlling physical conflict. Hastings seems to demand instant perfection of humanity, whereas Austin and Bruch search for paths to improvement. The parallels and contrasts explain why the well-rounded student might gain something from reading Hastings, while Hastings aficionados definitely need to read Austin and Bruch for the much stronger factual base it provides. When divergent sources like these arrive at similar outcomes, there is probably some basic truth involved.

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