

Wars and the Environment

Warfare in a Fragile World. Military Impact on the Human Environment. STOCKHOLM INTERNATIONAL PEACE RESEARCH INSTITUTE. Taylor and Francis, London, 1980 (U.S. distributor, Crane, Russak, New York). xiv, 250 pp. \$27.50.

Wars have always been environmentally destructive, but our capabilities to alter environments substantially have greatly increased during recent decades. Moreover, the nature of many current conflicts, especially those between a superpower and a technologically much less sophisticated opponent, generates pressures to wage war against the environment. Though this is familiar knowledge, there have not been systematic efforts to assemble existing information on the nature and extent of the environmental disruptions caused by past wars or to assess the vulnerability of different types of ecosystems to military perturbations. This volume, which attempts to fill this gap, is the effort of a single author, Arthur H. Westing, currently dean of the School of Natural Science at Hampshire College, Amherst, Massachusetts, while he was a senior research fellow at the Stockholm International Peace Research Institute (SIPRI).

The book begins with a general discussion of warfare and weaponry, general ecology and processes by which ecosystems recover from disturbance, and patterns of use and abuse of environments by people. The bulk of the book, occupying the next six chapters, treats the problems of temperate, tropical, desert, and arctic regions, islands, and oceans. For each a brief discussion of its geographical distribution and size, climate, and ecological communities is provided together with material on civilian and military impacts on those environments. The book closes with a general discussion of global ecology that synthesizes the author's views of the impacts of population growth and increasing military sophistication on the future prospects for the human species.

The book is heavily documented with tables of data assembled from diverse sources. There are statistics on the frequency of occurrence of wars of dif-

ferent levels of severity, brief accounts of wars judged to be particularly destructive ecologically, basic statistics on the sizes of continents and oceans, human populations, and population densities by regions, estimates of levels of biological productivity in different ecosystems and of plant biomass, numbers and sizes of urban areas, and data on the general levels of wealth of nations and the sizes of their armies. For each of the regions selected for analysis, statistics are given on the nations and colonies, their sizes and population densities, and the impacts of and rates of recovery from past wars. In addition, although the book is directed primarily toward an analysis of military impacts on environments, there are discussions of civilian impacts on the environment that summarize information presented in greater detail in many other places.

In view of the general recognition that wars are environmentally destructive, a key contribution of the book would be its treatment of the ways military activities affect ecosystems and how the differences among ecosystems in different parts of the world influence how military leaders are tempted to deal with them and how the ecosystems recover from various types of military perturbations. Unfortunately, the discussion of ecosystem recovery is based on the very simple notions of processes and patterns of vegetation succession presented in the first chapter. The author adopts a particular model of plant succession that assumes that succession is driven by site preparation by early colonists for later arrivals. The fact that current concepts of succession include at least three different models and that evidence is actually stronger for the alternatives is not mentioned. Nor is the fact that processes of succession probably differ in different ecosystem types, especially between dry and humid regions.

Treatment of the structure and functioning of ecosystems in the different regions of the earth is also inadequate. Lacking are sound discussions of soil formation processes, plant community structure, species richness, nutrient cycling, and interactions among species.

These are the key processes upon which understanding of the effects of military disturbance and the ways in which ecosystems can and will recover from those disturbances must be based. Not surprisingly, the discussions in the book consist mostly of citation of statistics on the extent of areas affected and bits of information on the states of recovery at varying periods after cessation of hostilities. Such information has its value but contributes little to an understanding of the dynamics of recovery. It also provides little basis for analysis of how one might use ecological information to accelerate processes of ecosystem recovery following military activity. In view of the fact that we are likely to engage in many more wars of varying sizes in the future, such knowledge has a distressingly high probability of being useful.

The superficial treatment of ecological processes and patterns in this book has deeper roots. The purpose of the book is basically not scientific. Rather the book is designed to highlight the extent of environmental destruction caused by past wars, to suggest what may be the environmental consequences of future wars, and to make a plea to humanity to come to its senses and take bolder action to avert future wars before it is too late. For this purpose ecological details are of relatively little use. It doesn't really matter if successional processes are different in forests and deserts. It doesn't really matter that mineral cycling patterns are different between tropical and temperate forests. And the author doesn't really want to offer suggestions for mitigation—prevention is his overwhelming concern.

Since I share the author's perception that human population growth and the arms race are the two most important threats to the future quality of human life, I wish to be supportive of all reasonable efforts to direct attention to these problems and their solutions. If the book does accomplish those aims, despite the inadequacies of its ecological treatments, it will have achieved its major goal. At the same time, it is questionable whether the cause of environmental quality is sufficiently motivating in the context of international relations to be a significant contributor to lowering the probability of future wars. However, I hope that I am wrong because the problems are serious and the efforts we devote to them are not proportionally large.

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