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Volume 3 Anthropogenic Compounds
Part U

The Handbook of Environmental Chemistry

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With contributions by

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D. Djordjevic · J. Hart · V. Kalafatic · B. S. Levy
V. Martinovic-Vitanovic · A. Mihajlidi-Zelic
N. R. Miljević · R. Misak · S. A. S. Omar · P. Polic
A. Popovic · D. Relic · Saif ud din · V. W. Sidel
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Volume 1: The Natural Environment and the Biogeochemical Cycles
Volume 2: Reactions and Processes
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The series Volume 1 The Natural Environment and the Biogeochemical Cycles describes the natural environment and gives an account of the global cycles for elements and classes of natural compounds.
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Preface

This preface starts with wording similar to that of the recent book *Contaminated Sediments* in this series. Indeed, I should repeat that again for the first time in my life I am not so glad to introduce this book entitled *Environmental Consequences of War and Aftermath* as part of *The Handbook of Environmental Chemistry* series. The main reason for this feeling is that the whole idea and proposal for this book originated from the late Assistant Prof. Tarek A. Kassim of Oregon State University, but unfortunately he is not with us to enjoy the final product of his ideas. Everything started as part of my role of co-editor of this series when I got the proposal from Tarek and I was asked to finalize the book. What I did basically was to wait for and then revise the manuscripts, and I pushed this project to completion. To be honest, the whole merit of this book is due to Tarek. I hope that his colleagues and friends can appreciate one of his last projects.

The first question is: Why do we need a book on environmental consequences of war today? Perhaps an even better question would be: Why did we still have wars in the twentieth century and why do we still have them in the twenty-first century? Apparently, we have not learnt the lessons of the past. We all remember the Gulf War in Kuwait and the war in the Balkans as two of the most recent ones. Each time, more and more sophisticated weapons are used and many chemicals are sprayed around the war zones, so civilian populations and military personnel as well are constantly being exposed to cocktails of chemical contaminants usually at high concentrations.

As pointed out in the introduction to one of the chapters, it is recognized that war leads to disastrous effects on people and the physical, biological, economic, and social environment. Environmental effects include (1) direct contamination of air, land, and water; (2) disruption of the infrastructure of society, which, in turn, leads to further environmental damage; (3) use of nonrenewable sources of energy; and (4) diversion of resources that might otherwise be used to promote health and protect the environment. Much information has been acquired on the environmental and human health effects of chemical warfare (CW) agents since they were first employed on a large scale as a method of warfare during World War I. Numerous uncertainties nevertheless remain, partly because CW agents were not developed or tested with the possible long-term adverse environmental or human health consequences as a deciding factor in determining whether an agent would be produced

and used in munitions. Rather the requirements for the agent's military effects took precedence. In addition, the interaction among the political, technical, and legal challenges connected with the known or possible risks posed by CW agents is complex and sometimes not well understood. This is usually because technical considerations, when acted on, are almost invariably informed by political ones, such as various legal requirements.

The book contains nine chapters covering different aspects of the research on environmental consequences of war and its aftermath and covers in one additional chapter more general issues such as prevention of war and its environmental consequences, the legal, political, and technical background to selected environmental and human health effects of CW agents, and the atmospheric transport and deposition of persistent organic pollutants under warfare conditions to more specific ones related to two main tragic examples: the war in the Balkans and the Gulf War. Aspects of the war in the Balkans cover contamination by heavy metals in Serbian national parks, the impact of NATO strikes on the Danube river basin, and the problems associated with transuranium elements. The Gulf War in Kuwait covers other problems related to the impact of oil contamination, the impact on groundwater resources, and the soil damage of ground fortifications among other environmental and health problems.

Finally, this book is challenging and its publication is timely. We should accept that most scientists who are involved in the field of environmental chemistry have limited experience with CW issues, while many of those who work with CW disarmament and nonproliferation issues tend not to have scientific backgrounds. This book provides the basic background to bridge both communities and to understand a bit more about the problem of environmental consequences of war and its aftermath. To minimize the environmental consequences of war and to help prevent war, public-health-based approaches should be developed. This books goes in this direction by providing documentation of the adverse impacts of war on the environment and a bit more education and awareness-raising for the public.

Finally, I would like to thank all the contributing authors for their time and efforts in preparing this comprehensive compilation of research papers that will make this book on environmental consequences of war and its aftermath unique in this field.

18 September 2008 D. Barceló

Department of Environmental Chemistry, IDAEA-CSIC, C/Jordi Girona 18–26, 08034 Barcelona, Spain, and Catalan Institute for Water Research (ICRA), Parc Científic i Tecnològic de la Universitat de Girona, Edifici Jaume Casademont, 15 E-17003 Girona, Spain

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