

BOOK REVIEWS

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Invasion Biology. Critique of a Pseudoscience

BY DAVID I. THEODOROPOULOS

xii + 236 pp., 22.5 × 15.5 × 1.5 cm, ISBN 0 9708504 1 7
paperback, US\$ 14.50, Blythe CA, USA: Avvar Books, 2003

Theodoropoulos sets himself the task to debunk invasion biology and replace it with a new theory. He attempts this in three sections comprising 13 chapters, preceded by a long introduction, which summarizes his findings and includes many blunt one-liners; the book concludes with a recapitulation and an afterword. In the first section, he selectively reviews the biological literature for bias, inaccuracies and unconventional views. In the second section, he identifies the psychological reasons why invasion biologists have fooled themselves, and this includes prejudice, anxiety, fear and delusion, all leading to violence, rituals and cults. He then claims that invasion biology is a pseudoscience and asserts that it emanates from Nazi ideology (Hitler's *Mein Kampf* is quoted at least a dozen times). This is one of the many wrong assertions made in this book. Had the author cared to read earlier literature, he would have been aware that the interest in biological invasions arose in the mid-nineteenth century. Indeed, in 1864, the Kew Garden Director J.D. Hooker stated that: 'Among the most interesting phenomena connected with the distribution of plants, are those that concern the rapidity with which some species of one country will, when introduced into another, rapidly displace the aborigines and replace them', and concluded that, 'the inquiry appears to be perhaps the most interesting and important in all biology'. This clearly invalidates much of this section. Throughout these two sections, Theodoropoulos comes across as a very angry man under siege who can not fathom why the scientific community can not see the 'truth' (a word used profusely throughout) as he sees it. Having dismissed invasion biology, he moves on to outline his replacement theory in a more restrained final section. Being a conservation biologist he wants to promote diversity, and to achieve this, species, with a few exceptions, should be freely translocated around the planet. This is supported by his early conclusions that introduced species increase species richness and nearly always present no threats to biodiversity.

This book is well produced with few typos and a substantial index. However, Theodoropoulos' style is aggressive and there are many repetitions. Most chapters are just short quotes strung together and ending with a blunt conclusion. The author is particularly adept at extracting quotes (evidence) from the literature supporting his beliefs. No attempt is made to separate and contrast quotes from the scientific, popular and journalistic literature. Much of what Theodoropoulos accuses invasion biologists of doing, such as the use of emotive, strong and inappropriate language, characterizes his own writing. He suffers from delusion and a belief in conspiracy theories, to which he strongly objects. Theodoropoulos is often vindictive, for instance he goes as far as suggesting that invasion biologists should be re-educated, so that they can be deprogrammed from their antiquated, distorted and fabricated beliefs. The way in which many of the issues are addressed may reflect the extreme and conflicting views that afflict conservation and restoration biology as well as the political debate in the USA, but much of it will be rather alien to non-USA citizens.

The key aim of this book is to demonstrate that invasion biology is a pseudoscience to be replaced by a new theory of 'anthropogenic dispersal', but Theodoropoulos totally fails to convince, especially as his target readership is professional biologists. The author fails to quantify and synthesize his observations gleaned from the literature and ignores contradictory evidence. At times he contradicts himself; thus on p. 68 he views the precautionary principle as applied to species introductions as totally unacceptable, whereas in the previous paragraph he considers it essential for the use of herbicides. Also, Theodoropoulos' ability as a scientist is rather limited. He has a poor grasp of biogeography, evolution and some aspects of ecology. Although he cites 23 of his own publications, none is published in a scientific journal. Eight of them have the same title of 'Germplasm news and views' and all are published as short notes in the Society for Economic Botany Newsletter. Furthermore, his seminal paper 'Natives versus exotics: the myth of the menace', cited at least a dozen times in the text and the basis of this book, is a mere 712 words long! In fact, reading this pamphlet and associated short notes (<http://www.dtheo.com/NativesVs.Exotics.htm>) will suffice to provide any potential reader with a good enough summary of his views and will illustrate his peculiar style. If you want to be intellectually stimulated then spend your money and time on nearly any other book on the topic rather than this one.

PIERRE BINGGELI
SAFS, University of Wales
Bangor LL57 2UW, UK
e-mail: pierre_binggeli@yahoo.co.uk

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Stakeholder Incentives in Participatory Forest Management: a Manual for Economic Analysis

EDITED BY MICHAEL RICHARDS, JONATHAN DAVIES AND GIL YARON

xvii + 238 pp., 62 figs, 24 × 17.5 × 1.5 cm, ISBN 1 85339 559 5
paperback, GB£ 19.95/US\$ 32.50, London, UK: Intermediate
Technology Development Group Publishing, 2003

The book is aimed at those development professionals working in the natural resources sector, agriculturalists, foresters, social development practitioners and social foresters who do not have any formal training in, and have limited experience of, applying economic principles in practice. The authors' main objectives for the book are: (1) to increase these groups' understanding of the costs and benefits of participatory forest management (PFM); (2) to overcome the paucity of guidance and practical methods available to those working in the field; and (3) to demonstrate the relevance of economic tools in helping to analyse and understand resource decision-making at micro or project level, rather than the policy level.

The book begins by taking the reader through some basic descriptions of the economic features of forests, and uses a chapter to outline the fundamental economic principles important to any economic analysis of forest use and management (such as, supply/demand, total economic value, discount rates and marginal returns). Splitting the economic stakeholder analysis (ESA) into six steps

or stages, specific guidance is given on: when and when not to conduct an ESA; how to identify and characterize stakeholders; how economics might help to understand the decision-making context; how to identify and quantify costs and benefits; how to value those costs and benefits; how to judge economic alternatives; and how to apply participatory analysis and monitoring in support of the ESA.

By including a wide range of well-selected and clear illustrative material and examples drawn from the authors' own experiences overseas, as well as reassuring examples from other well known academics and practitioners, such as Shanley, Cavendish, Campbell and Poffenberger, the authors have tried more than most to ground themselves firmly in reality rather than the academic abstract. The methods espoused for each stage in the ESA are logically organized and will also be familiar to the intended readership, being taken for the most part from the tried and tested participatory toolkit. What is new perhaps is the way these things have been repackaged and focused towards a particular task, with suggestions for new or alternative quantitative economic exercises to run alongside the familiar repertoire. Most useful in this context is the way in which the authors have constructed the progression of the chapters to demonstrate how data collected using techniques such as ranking and scoring can be used in extended economic analyses. Whilst such familiarity provides an easy introduction to the subject matter, the authors have provided some sensible and worthwhile cautionary notes about mistakes that might be made and the limitations of applying participatory processes and research exercises during an ESA. The latter chapters of the book also provide some challenging applications of economic valuation and decision-making techniques and algorithms of which practitioners may well have heard (such as returns to labour, inflation/depreciation, cash flow analysis and sensitivity analysis), but either neglected or shied away from using. In these sections, formulae are clearly laid out with supporting worked examples and real-world results to demonstrate the utility of the approaches in practice.

While the overall feel of the book is friendly and the language accessible, it is perhaps in these later chapters that in trying to introduce the reader to the range of economic tools that might prove useful, depth of discussion has been sacrificed over the authors' enthusiasm to cover all the techniques available. Without reference to the appendices and glossary, some readers might find these sections heavy-going and see them as verging on being jargon ridden. However, throughout the text, the authors have provided references to further reading that expands on the ideas and techniques they have introduced, and they have included a useful annotated bibliography of sources for further guidance.

Overall, this book will provide a useful addition to the range of manuals supporting participatory forest management. The authors succeed in large measure in achieving their aims of providing practical guidance in how to structure and conduct an ESA, and in demonstrating its use in identifying the costs and benefits of alternative management options. Although readers may not become expert in conducting the economic analyses suggested, with this book in hand they will at least appreciate what their participatory projects ought to be taking into account as they present alternative management scenarios, and the implications of these, for discussion amongst stakeholders.

BIANCA AMBROSE-OJI
Centre for Arid Zone Studies
University of Wales
Bangor, Gwynedd LL57 2UW, UK

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Lowland Grassland and Heathland Habitats

BY ELIZABETH A. C. PRICE

xii + 246 pp., 32 black and white plates, 8 colour plates, 10 figs and 63 tables, 25 × 19 × 1 cm, ISBN 0 415 18762 1 hardback, GB£50.00, London, UK/New York, USA: Routledge, 2003

This book describes the ecology and management of lowland grassland and heathland habitats of Britain. Some major nature conservation issues are illustrated in the form of case studies. The book also provides readers with ideas for practical projects to gain a greater insight into the functioning of these habitats.

The book is a very useful guide to anyone interested in the grassland and heathland habitats of Britain; it will be of particular value to the broad school of students from first to higher degree that are studying terrestrial ecology. The author is to be congratulated on condensing a tremendous amount of information into this guide. Tables are used effectively to summarize large chunks of information and allow relatively quick scanning of particular topics. The information is well referenced and will provide any student with a sound route into the literature. The provision of some texts for further reading on specific topics, the addition of a glossary of terms, and the species index in addition to the subject index all help to make this a user friendly guide. The inclusion of 34 attractively illustrated species boxes, which provide brief details of the characteristics and ecology of the species plus source references, enlivens the text and adds to the readability of the guide.

It is easy to be positive about this guide and recommend that it should be on the bookshelves of all who are interested in lowland grassland and heathland habitats in Britain. Criticisms or errors are minor. A small irritation p. 2 was the suggestion to compare Plate 3 with Figure 1.1. It would have been helpful to give the location of Plate 3, which is between pp. 84 and 85, and it would have been helpful if Plate 3 showed the distributions of grassland categories more clearly. It is well nigh impossible to distinguish the bright green improved grassland from the olive green acid grassland. I also noted a few spelling errors, such as *Convolvulus arvensis* on p. 207 and *Bromus erecta* on p. 209.

JERRY TALLOWIN
JGER
North Wylke
Okehampton, Devon, UK

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Environmental Change and Human Development: Controlling Nature?

BY C. J. BARROW

viii + 253 pp., 23 × 15.5 × 1.3 cm, ISBN 0 340 76404 X paperback, GB£ 16.99, London, UK: Edward Arnold Ltd, 2003

The stated rationale for this textbook is that existing literature tends to emphasize how human activities are changing environments, leaving a need for a book that explores how changing environments affect human development. An introductory chapter gives an informative review of the ways in which society-nature interactions have been conceptualized in western intellectual traditions, with particular attention to the kinds of debates that have taken place

within 20th century geography. The bulk of the text is then devoted to outlining historical and contemporary environmental changes that threaten human livelihoods. The final chapters focus on the important issue of coping with uncertain and changing environments, asking how societies can become more resilient to environmental change.

The book is generally well researched, easily accessible and informative, especially the earlier chapters. As such, I do not hesitate to recommend it for inclusion in library collections and extended reading lists. However, I do have some criticism of the way in which the material is organized and about the selection of materials. Many of the chapters develop into lists of environmental hazards, with anything from a few lines to several pages on each. Chapter two centres on a list of 15 possible causes of mass extinction, chapter three contains lists of extreme weather events and other natural hazards, chapter five is in its entirety a list of hazards, and so on. There are a number of issues raised by this approach. Firstly, each topic is only dealt with briefly and in a rather fragmentary way. Earthquakes, volcanoes, tsunamis and so on appear in most of these lists and therefore get a few pages in each chapter. Secondly, I have some concern with the emphasis given to different hazards. For example, chapter five's catalogue of 'ongoing natural threats' devotes eight pages to the threat of meteorite collision but only ten lines to crop and livestock disease. In the catalogue of current diseases, two pages are given to bubonic plague and just eight lines to the AIDS pandemic.

Readers might question the selection criteria for inclusion in these lists of 'environmental change'. The back cover promises 'key issues such as soil degradation, natural climatic variation and volcanic activity'. I could find nothing on soil degradation. Even with the help of the index, the reader is only steered to a sentence that states that this topic has already been discussed. This provides an important clue to the emphasis of this book. The inclusion of the so-called natural hazards and exclusion of more obviously human-induced changes (with the exception of climate change) points to the fact that this is really a book about hazards and not about environmental change *per se*. It is about the threats posed by earthquakes, storms and so on, and does not attempt to cover changes such as deforestation, pollution, loss of biodiversity or soil degradation. This is no doubt intentional, because the author sets out to avoid detailing human-induced impacts on the environment. And yet this is a book about how environmental change affects human development and I can not help coming back to the feeling that, for the moment at least, soil degradation affects us more than meteorite storms or even volcanoes.

Students of human geography or development studies who adopt this as a hazards text would require complementary reading that deals with issues of social organization. This is most noticeable in the chapters about responses to hazards. There is useful discussion of scientific responses (such as prediction), financial responses (such as insurance) and physical measures (such as water storage), but the references to social capital and governance are never developed. Social science students would probably want to explore the links between environmental change and emergent forms of governance.

Despite these reservations about the choice of content, I do think that the book contains much good material, often told with interesting anecdotes and examples, and adequately illustrated. It is a bit of a roller coaster ride, racing from topic to topic at sometimes dizzying pace and often leaving you with the feeling that you want or need to know more about the topic you have just left behind. Perhaps this

is exactly the feeling that an introductory textbook should leave you with.

ADRIAN MARTIN
School of Development Studies
University of East Anglia
Norwich NR4 7TJ, UK

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Vital Signs 2003–2004. The Trends That Are Shaping Our Future

BY WORLDWATCH INSTITUTE

170 pp., 23.6 × 17.7 × 1.3 cm, ISBN 1 84407 021 2 paperback, GB£ 14.95, London, UK: Earthscan Publications Ltd, 2003

If you want to know more on the current status of global trends, more in terms of accurate data, *Vital Signs 2003–2004* is the book to read, and you can receive a crash course in understanding various issues ranging from meat production to world economy, and from military expenditure to global climate change.

The Worldwatch Institute, a think-tank based in Washington DC, monitors rapidly changing major trends such as food, energy, economy, transportation, communication, health, military and environment. These crucial trends have the potential to shape the 21st century. It publishes documents such as the annual *State of the World* report, *World Watch Magazine*, *Worldwatch Papers* and *Vital Signs*, which contains data extracted from numerous reports, scientific papers and other documents obtained from government, industry, scientists and international organizations.

We live in an electronically wired world today where information is easy to access. For example, there are 41 internet users per 100 people in developed nations, while 2.3 per 100 are users in developing nations. However, most of the cyber age information is not peer-reviewed and sometimes tends to give readers inaccurate views on issues. Modern news and television media seem to cover mostly glamour, sex, violence and politics. So we miss a lot of facts that we ought to know; for example the status of declining bird populations around the world or the extent of poverty in developing countries. Most people agree that we cannot live without a biosphere, and we have to know the ups and downs of technological development and the fate of our changing environment.

Vital Signs 2003–2004 is the twelfth volume in the series from the Worldwatch Institute in cooperation with the United Nations Environmental Program, and it shows in graphic form the key global trends. Part one has categorized trends in food, energy/atmosphere, economy, transportation/communication, health/social and military. Part two has covered special features on the environment, resource economy, alternate medicine popularity, maternal deaths, corruption and resource wars.

The past year was marked by frequent explicit reminders of loss of lives due to environmental turmoil. South Asia was hit by a severe heatwave in May and June 2003. Temperatures reached 50°C leading to the death of 1200 in India alone in one week. Statistics published by *Vital Signs 2003–2004* show that economic losses from weather-related disasters worldwide totalled US\$ 53 billion in 2002. Though this figure is less than the peak recorded US\$ 100 billion in 1999, it indicates that the unprecedented losses from weather-related disasters that hit the world in the 1990s are continuing into this new decade.

These statistics reflect the intersection of two powerful global forces, growing environmental degradation and persistent poverty. Poor people living in precarious conditions are the least protected and most vulnerable to natural disasters such as the storms and floods, which are enhanced by the uninterrupted deforestation, soil, erosion and climate change. The human suffering and mortality behind the statistics are an undeniable reminder that environmental and social progress is not a luxury that can be put aside when the world is experiencing economic and political problems. Rather, they are central to our own survival. Unless the world can make better headway in improving environmental and social health in the years to come, the toll of weather-related disasters is likely to continue.

How do we protect Earth's fragile ecosystems without denying billions of people a chance for a better life? How do we improve the human living standards without damaging the delicate balance that sustains all life on our planet? The World Summit on Sustainable Development in 2002 finally brought attention to these questions. Scholars are now debating underlying strategies and managers are contributing their own proposals for change. Disparities between rich and poor have deepened through globalization, increased trade, investment, travel and other border-transcending changes. The world economy has grown sevenfold since 1950, but this has not relieved poverty. About two billion people worldwide are struggling to survive on a few dollars a day or less, and some 815 million people are chronically hungry because they cannot afford to buy food. Lack of clean water or sanitation kills 1.7 million people each year, 90% of them children. Between 1960 and 1995, the disparity in per caput income between the world's 20 richest and 20 poorest nations more than doubled. Chief Executive Officers in the USA made 350 times as much as the average factory worker in 2001.

Farm subsidies of more than US\$ 300 billion yr⁻¹ allow food crops exported by farmers in industrialized countries to be sold at prices 20–50% below the cost of production, undermining farmers in developing nations. In Mexico, Peru and Columbia, farmers cannot be blamed for producing drugs such as coca or cannabis, because their food crops cannot compete with cheaper mass-produced imports. In Afghanistan, warfare destroyed most of the legal harvest and drug crops have become lucrative because of high demand in wealthy nations.

Lower incomes escalate into poor health, greater mortality and shorter life expectancy. The infant mortality rate in low-income countries is 13 times the rate in high-income countries; 99% of all pregnancy-related deaths occur in developing countries, where women face a lifetime risk of maternal death that is 40 times greater than that of women in industrialized nations. Those who earn less than US\$ 2 per day in developing countries are tormented by an array of infectious diseases; with 36% of the global population, Africa and South-east Asia account for 75% of deaths from such diseases. To make things worse for the poor, most armed conflicts take place in the developing world. Widespread warfare and political repression mean that developing countries generated 86% of the world's refugees in the past decade.

As the world's single largest carbon emitter, the USA is doing more than other nations to warm the global atmosphere, yet it has abandoned the Kyoto Protocol. By the end of January 2003, more than 100 nations had ratified the protocol, including the 15 nations of the European Union, Japan and Canada.

In the twentieth century, the global sea level rose 10–20 cm. According to the Inter-government Panel on Climate Change, the sea level will rise by 9–88 cm in the next 100 years, with serious impact in small island nations.

Around the world, ornithologists are alarmed at bird population declines. In 2000, a study by BirdLife International found that as many as 12% of the world's 9800 bird species are threatened with extinction within the next century. Conservationists have catalogued 7000 important bird areas that are critical bird breeding and migration stopovers in 140 countries. While wildlife reserves remain vital to protect bird habitats, much of the world's land sits in private hands. Thus community, corporate and government investment in varied conservation efforts will be required to safeguard biodiversity.

This book clearly illustrates with figures and tables that the diversity of birds is declining, carbon emissions are above the earth's carbon-fixing capacity, and poverty in developing nations is leading to social unrest. Amazingly, this book has been used by various groups of professionals worldwide; university professors use it to teach courses on human behaviour and environment; lawyers and educators use this as a training tool; advisors who work for oil and land development companies use this as an environmental resource guide; journalists use this as a research tool. *Vital Signs 2003–2004* is a vital tool for all those who are desperate to be informed about recent trends in environment, economy and life in a rapidly-changing world.

GOVINDASAMY AGORAMOORTHY
Tajen Institute of Technology
20 Wei-Shin Road, Shin-Ell Tsun
Yan-Puu, Pingtung 907, Taiwan
e-mail: agoram@mail.nsysu.edu.tw

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Conservation, Ecology and Management of African Freshwaters

BY THOMAS L. CRISMAN, LAUREN J. CHAPMAN, COLIN A. CHAPMAN AND LES S. KAUFMAN

xxii + 514 pp., 52 figs, 22.5 × 15 × 2.4 cm, ISBN 0 8130 2600 8
paperback, US\$ 34.95, Gainesville, USA: University Press of Florida, 2003

Although I have some criticisms of this book, I want to state up front its overwhelming redeeming qualities: this is a fascinating review of African freshwater systems, highly readable and full of interest for anyone with a concern in conservation or in the components, processes and management problems of natural freshwater systems.

The book aims to 'identify regional issues in the conservation and management of African inland aquatic systems and to develop generalizations as a baseline for decision making in the twenty-first century' (p. 474). It comprises a series of papers written by 30 different authors, presented at two meetings: the first an annual meeting of the American Association for the Advancement of Science in 1998, the second held on an unknown date at the University of Florida. The book is divided into four sections: the first is a historical perspective of African aquatic systems (two chapters); the second a review of emerging management issues and conservation challenges (five chapters); the third describes major aquatic systems in Africa (nine chapters); and the fourth focuses on human dimensions of aquatic conservation and management (five chapters). There is a final synthesis by the book's authors. The book is highly readable at any level, from educated layperson, to conservation managers and professional researchers.

The book does identify the issues and develop generalizations. Whether these generalizations are always useful as a baseline for decision-making, I am not so sure. The problem is that, in many of the chapters, the conclusions are too general to be of much help to managers and decision-makers. This is not always the fault of the authors; in much of Africa there is simply not enough information or knowledge on which to base management decisions.

In any collection of papers by as many authors as this there is bound to be a variety of quality, and, in general, the main authors have done a good job of organizing the material to provide coherent coverage of the subjects. The first two chapters provide a fascinating historical overview. Chapter 1 describes the African palaeoclimate and its effects on lakes, providing more questions than answers. Chapter 2 emphasizes the importance of learning the lessons of archaeology about the environmental and management history of African freshwater systems in the past millennium. Both provide a context of change and variability at different time scales that is vital for an understanding of these natural resources.

The regional perspectives of the second part of the book begin with two rather generalized overviews of water resources in southern and western Africa. These both contain rather more opinions than information. For example, '... fear that many aquatic species ... have become extinct ...' (p. 55), is of limited value without any examples or evidence. For 'These dams result in profound changes to the hydrology of the rivers and far-reaching ecological effects' (p. 66), references are given, but there is no hint of what these changes might be. On p. 67 there is a section on 'Key Water Issues' and on p. 75 on 'Recommendations', but these are expressed as generalizations, without examples, and are of limited practical use. I am not familiar with the information base for West Africa, and it may be that there is insufficient knowledge to be specific, but the southern African chapter is disappointing because there is relatively a wealth of information and examples that are not used.

Chapter 5 concentrates on Lake Victoria, and particularly on the effects of the introduction of Nile perch. This is more informative than the previous two chapters, but is vague in places: Nile perch were apparently originally blamed for the disappearance of endemic species, but 'later findings strongly indicate ... other factors', which are referenced but not spelled out. The other chapters in this section are generally interesting and informative, but I picked up some factual errors where I have expertise, leading to suspicions that there may be others on subjects or regions about which I know less. Chapter 7 is a very interesting discussion of the aquatic biodiversity of Madagascar, but accompanied by a spectacularly uninformative map of the major rivers and lakes of the island, without any labels at all, no scale and no compass points, something I would not accept from a first-year student.

For the most part, the next section of nine chapters provides more detail, and therefore more useful information and practical advice, generally by concentrating on case studies. The chapters which concentrate on fish communities, such as chapter 8 on river fisheries, chapter 9 on the fish assemblages of the Congo River, chapter 12 on fish community structure and adaptive radiation, and chapter 13, a slightly eccentric but interesting account of eutrophication and its effects on fish vision, are all very informative. It seems that, incomplete though it is, the knowledge base on African fish is much more extensive than on other aspects of the biota. Chapter 10 on wetlands could have been left out of the book. The authors acknowledge that very little is known about wetland processes and functioning in Africa (although there has been considerable work in the Okavango Delta), and proceed with a very generalized account,

making use of examples from almost everywhere except Africa. This chapter also contains three very uninformative figures purporting to illustrate various aspects of the terrestrial-wetland ecotone, but practically without any labelling or explanation. I very much enjoyed chapter 15, discussing the pros and cons of the Aswan High Dam on the Nile. This is as clear and objective an account of the various advantages and disadvantages of the dam as I have read. The author makes no attempt at an overall accounting of pros against cons, and this seems right to me; it is impossible to compare the costs of losing ancient monuments with the benefits of year-round irrigation. Chapter 16 is a useful account of available models for assessing eutrophication, explaining their various capabilities, data requirements and limitations. Managers should find this chapter clear and informative. It emphasizes the lack of data for input and verification of the models north of South Africa, and also the distressing lack of progress in the South African knowledge base on eutrophication in dams since the heydays of the 1970s and 1980s.

The fourth section of the book, discussing the human dimensions of water resource conservation and management, begins with a largely anecdotal, but nevertheless interesting and informative account (chapter 17) of Botswana's limited water and riparian resources. Chapter 18 is an excellent discussion of H.T. Odum's concept of emergy as an holistic means of comparing conservation options of resource use with those of development and exploitation. The explanation and a detailed case study evaluating water supply alternatives for Windhoek, Namibia, make a good case for emergy. Chapter 20 is a very useful anecdotal story of how to, and how not to, organize a community fishery, with a case study from Lake Mbuoro National Park. A detailed review of a regional onchocerciasis (river blindness) control programme in west Africa (chapter 21) provides the lesson that simply concentrating on eradicating the vector (blackfly of the genus *Simulium*) and curing people is not enough; the socio-economic and environmental consequences of large numbers of people moving into areas where the disease has been controlled require extensive monitoring and management themselves.

The final synthesis chapter by the main authors acknowledges the lack of information, and therefore the difficulty of predicting future consequences for African freshwater systems. They conclude with five generalizations that they hope 'will set the stage for further exchange of ideas and the development of conservation and management approaches for African aquatic systems'. Their generalizations are simply too general to be useful other than as a starting point for debate: (1) crises in water management in Africa are imminent; (2) research and monitoring have not been able to keep pace with socio-economic development and environmental change in Africa; (3) there is a pressing need to translate research findings into policy; (4) water management is viewed separately from terrestrial watershed issues; and (5) continent-wide exchange of knowledge is valuable.

The book is smart enough, and well organized and laid out. The typeface is easily legible, with the different sections of chapters clearly marked with bold headings, although it would have been useful to have sections numbered, and the chapter number at the top of each page. There is a helpful list of abbreviations at the beginning of the book. The figures and tables are generally clear, but I have already suggested that some of the figures needed a lot of additional explanation to be useful.

I said at the beginning that the book's good points more than outweigh its problems. Its scope is brave and vast, given the size of Africa, the variety of freshwater systems and the lack of information about most aspects of them. I learnt a great deal from reading it, and

it is certainly an excellent beginning in synthesizing what is known. The mistakes, poor diagrams and generalizations are frustrating, but not fatal to the value and enjoyment that I got out of the book. Perhaps I can follow the style of the book and draw a few general conclusions of my own.

Information about African freshwater systems is extremely patchy, especially in relation to an understanding of the processes and functions that maintain their ecological integrity. The book identifies lots of threats to that integrity, but with very little quantification or predictive capability. There are lots of ideas about what should be done, but few details as to how they can be done, or where to find the resources to carry them out. The most successful chapters are those focused on a single issue, rather than on broad regional overviews, and those presenting one or two detailed case studies, even when these are largely anecdotal. One of the central assertions of the book, reiterated in many of the chapters, is that the basis of all the environmental problems in Africa is the ever-increasing density of the human population and the assumption that this will continue to rise exponentially. Recent population models for South Africa predict that the population will peak at just under 47 million in 2008, after which it will decline, largely because of the AIDS epidemic (ABT Associates 2000). If this were true of much of sub-Saharan Africa, then the assumptions on which this book is based would have to be considerably revised.

This book is very reasonably priced and is certainly a worthwhile addition to the library of anyone working in Africa on freshwater systems. I shall refer to it often. The main authors have done a great job in getting together the number and variety of contributors, who have presented an astonishing variety of insights and information covering many aspects of a large diversity of systems.

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JAY O'KEEFE
Institute for Water Research
Rhodes University
PO Box 94, Grahamstown, South Africa

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The Real Environmental Crisis: Why Poverty, Not Affluence, is the Environment's Number One Enemy

BY JACK M. HOLLANDER

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 hardback, US\$ 27.50/GB£19.95, Berkeley and Los Angeles,
 USA/London, UK: University of California Press, 2003

The theme of this book, as Bruce Ames notes on the back cover, is that 'science, technology, markets and affluence are the friends of the environment and poverty is the enemy'. The 'real' danger is not that affluent people will carelessly damage our environment, but that impoverished people will be driven to do so. Affluence not only gives people the capacity but also the desire to address environmental problems.

In short, this book favours modernization, is optimistic that environmental problems can be solved, and critical of the technological and environmental pessimism that characterizes a large part of the environmental movement. The author is particularly critical of environmentalists who, to counter what they perceive to be public apathy and complacency, exaggerate the environmental threats that increasing affluence can bring, and ignore its environmental benefits.

At the core of the book are eleven chapters reviewing some of the most widely debated environmental issues: overpopulation, food scarcity, global warming, water scarcity, air pollution, fossil-fuel scarcity, solar power, nuclear power, transport and biodiversity. In each case the analysis is related back to the book's overarching theme. In several cases, such as global warming and the dangers of nuclear power and biotechnology, the author argues that fears are largely misplaced or exaggerated. In other cases, such as overfishing and the overuse of water, the source of the problem is located in inadequate institutions rather than any inherent overconsumption associated with affluence. And in most cases where serious problems are acknowledged, these problems are presented as far more severe in low-income countries than in affluent countries.

The chapters are well written and, for the most part, well argued. While the author's particular expertise in energy shines through, the presentation of technical material is always clear, coherent and concise. The book's criticisms of attempts to blame the world's environmental problems on affluence deserve to be taken seriously. Technological pessimists would do well to read this book. They may not find the arguments convincing, but they should find them challenging.

The book never fulfils the promise in its title: to describe the 'real environmental crisis' and demonstrate that poverty is 'the environment's number one enemy'. Indeed, very little serious attention is devoted to poverty-related issues. It is as if the choice were between affluence and poverty as 'the environment's number one enemy', and that demonstrating that affluence can be good for the environment leaves poverty as the obvious suspect. Despite the author's clearly stated aversion to rhetoric and exaggeration in the hands of pessimists, he is not averse to deploying them in the name of progress. Moreover, while claims that link affluence to environmental degradation are treated with a rigorous scepticism, claims linking poverty to environmental degradation are presented uncritically.

The author's principal explanation for why poor people harm the environment is a familiar one; they cannot afford to be concerned with the quality of the environment and the future availability of natural resources. He uses this to explain a range of problems, from why poor farmers are more inclined to clear forests and degrade their soils, to why poor households use smoky fuels and have inadequate water and sanitation. But there is no serious attempt to examine the evidence and arguments. The critically important distinction between being forced to live in inadequate environments, and contributing to environmental degradation, is barely acknowledged.

The cover photo reflects the failure of the book to heed its own advice and avoid misleading exaggeration. It is a photo intended to shock: a settlement of waste pickers' huts on Smokey Mountain, a waste dump near Manila. This is apparently meant to illustrate how poverty and environmental distress go hand in hand. But the book does not explore how such people live and the environmental problems they face. If it did, the book's main argument would be far more difficult to sustain. The inhabitants of Smokey Mountain are undoubtedly poor. They undoubtedly live in a very

unhealthy environment. But it is hard to see them as enemies of the environment. Poverty, far from driving them to degrade the environment, is driving them to risk their lives recycling materials with very little market value.

Both poverty and affluence can affect how people use and abuse the environment. Environmental challenges do tend to be different in conditions of affluence and conditions of poverty. But these differences are by no means simply a matter of relative importance, and the very notion that you must choose whether affluence or poverty is the greater threat to the environment is misleading. It is a pity that this book tries to force the choice.

GORDON MCGRANAHAN
International Institute for Environment and Development
 3 Endsleigh Street
 London EC1H 0DD, UK

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The Sunflower Forest. Ecological Restoration and the New Communion with Nature

BY WILLIAM R. JORDAN III

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 UK: University of California Press Ltd, 2003

In the eight chapters and accompanying notes of *The Sunflower Forest*, Jordan proposes a new paradigm to guide the relationship of humans with their environment. The title is a reference to a human-impacted landscape in Loren Eiseley's 1970 book, *The Invisible Pyramid*, which represents 'nature first compromised and then redeemed by the human imagination'. The future of classical landscapes, Jordan insists, depends on a relationship that is intimate with nature not separate from it. Ecological restoration is the approach that engages us in activities to explore both the historical context of landscapes and to demonstrate ways to counteract the negative changes imperilling their structure and functioning. Most important, however, ecological restoration is participatory. Through restorative actions, we begin to understand our own limitations, or as Jordan puts it, the shame of a universal debt to nature we will never be able to repay. The opportunity ecological restoration offers us is not an attempt to reverse change, but to provide for change resulting in self-sufficient ecosystems. It is, in a sacred sense, a gift to a chaotic and violent, not innocent, nature. Ecological restoration, therefore, is the new communion, the hope for the survival of the classic landscape, an alternative to present environmental views that fail to resonate opportunities for creating our place in the world.

Although *The Sunflower Forest* is not intended to be a scholarly book, Jordan synthesizes his ideas based on the critical works of American environmental movement icons Aldo Leopold, Henry David Thoreau and John Muir, anthropologists Victor Turner, Roy Rappaport and Mary Douglas, and literary critics Frederick Turner, Leo Marx and R.W.B. Lewis. His Roman Catholic background underpins and guides all of his assumptions and conclusions. In addition, he pays tribute to ecological restorationists by incorporating their thoughts, debates and assessments of restoration actions into his thinking. In so doing, he adds his voice to ongoing debates about the value of restored nature and, inevitably, of ecological restoration.

The Sunflower Forest may not be scholarly, but it is not light reading. Environmental ethicists and theorists will find Jordan's biblical, pre-modern and indigenous cultural, and historical environmental references intriguing. For the ecological restoration practitioner, however, interesting anecdotal stories about their work are sprinkled throughout the book. In addition, Jordan has crafted answers to questions by those who would disparage the discipline. And he has provided reasons to continue to explore restoration as a foundation for a new nature-human relationship. Some of his statements are provocative and controversial. For example, he compares ecological restoration to gardening and maintains restoration is not gardening because restoration, 're-complicates the system in order to set it free'. He counters American ideas about preservation of pristine landscapes by stating that preservation is impossible: 'Ultimately, the future of a natural ecosystem depends not on protection from humans but on its relationship with the people who inhabit it or share the landscape with it'. And, finally, Jordan answers those who would accuse ecological restorationists of playing God: 'Making a prairie or a wetland – playing god, some have called it – what presumption! What arrogance! What wicked conceit! Yes – and how inevitable. How dangerous. How shameful and – in the end – how beautiful'.

Jordan's thinking, like ecological restoration, is evolving. This book's importance lies in the direct confrontation of questions that currently rattle those whose avocation or vocation brings them head-to-head with angry resistance to ecological restoration's techniques. It is also an important and substantive beginning to marrying a growing body of restoration knowledge with restoration rituals that build, in Victor Turner's word, *communitas*, a unity with others resulting in a deeper, richer way of living on the land.

KAREN M. RODRIGUEZ
Seeding the Snow
 17 Dunes Forest Trail
 Chesterton, IN 46304, USA
 e-mail: krod17@msn.com

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The Effects of Air Pollution on the Built Environment

EDITED BY PETER BRIMBLECOMBE

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 hardback, GB£ 26.00, London, UK: Imperial College Press, 2003

Concern over the damage caused by air pollutants to building materials has been expressed since at least the 17th century, as Peter Brimblecombe and Dario Camuffo point out in the first chapter of this edited volume, quoting Keepe in 1683 who referred to Westminster Abbey as being 'the skeleton of a church than any great comeliness in her appearance, being so shrivelled and parcht by the continual blasts of the northern winds, to which she stands exposed, as also the continual smoke of the sea-coal which are of a corroding and fretting quality . . .'. Research into the causes, nature and management of such pollution-induced damage reached a peak in the 1980s and 1990s, as both the European Union and USA Congress funded many studies, some of which are reviewed by contributors to this volume. As the introduction to this useful book suggests, the future focus of cultural heritage research is not so clear, and air pollution damage to buildings may be less favoured as a research area.

The 13 chapters of this book cover: long-term damage; the key factors causing damage; the mechanisms of damage to stone, brick,

concrete, mortar, metals and glass; the role of salts and crusts; organic pollutants and ozone; the nature and patterning of soiling; sources of pollution in urban areas; and patterns of decay on buildings. As such, the book provides a really wide but clearly organized survey of 'all you want to know about air pollution effects on building materials'. Most chapters are well written and informative, with some providing especially useful summaries of grey-area literature and original research findings. The book would make an excellent introduction for students starting research in this area, for those following specialized courses on applied science, and for policymakers seeking a good introduction to a diffuse field.

Overall, this volume succeeds well in its aim to examine a range of materials and discuss the ways in which they are likely to be damaged by air pollutants. There is a wealth of useful information, and the wide scope means that it is of broad interest. As with most edited books, there is no overall conclusion, and most chapters do not give much of an idea of where this research might be going and

where the major new research frontiers are likely to be. This is a missed opportunity, as the authors together could have made some useful recommendations for further cultural heritage research that would build on the strengths of the work surveyed in the book. The reference style is inconsistent between chapters, and with no titles provided for journal articles there is a lack of detailed information about each reference. The book also has a rather dated feel to it; despite being published in 2003 there are only a handful of references dating from 2000 or later. However, the book is amazingly good value for a hardback specialized volume and I would hope that everyone interested in building materials damage will buy it as a highly useful resource.

HEATHER A. VILES
School of Geography and the Environment
University of Oxford
Mansfield Road, Oxford OX1 3TB, UK