

changes are the addition of summary boxes with 'Topics covered' and 'Key words' at the beginning of each chapter, and the placement of 'Points for discussion' questions at the end of each chapter rather than at the end of the book. These changes make the chapters more effective as stand-alone introductions to specific environmental issues. Indeed, the nature of the book is such that chapters are unlikely to be read in order from beginning to end, and readers are more likely to use the book as a resource for following up specific topics of interest. The information within chapters has been expanded and updated, as have the references for further reading and the lists of websites that come at the end of every chapter.

Despite most chapters being able to stand alone, several common themes running through them give the book coherence. One of its strengths is the abundant cross-referencing between chapters, helping the reader to recognize the similarities between different environmental issues and to appreciate the ways in which they interact. The first three chapters ('The physical environment', 'The human environment' and 'Sustainable development') should be read first by students because these provide the foundation for understanding the many different topics that follow. Key physical concepts treated here include natural cycles, feedback processes, thresholds and different time/space scales of environmental change. Key social and economic issues include perceptions of the environment, trends in population and development, the 'tragedy of the commons' and the influence of technology and transnational corporations. The concept of 'sustainable development' and different approaches to dealing with environmental problems appear in Chapter 3 and in the final chapter, helping to show how the various environmental issues fit within the big picture.

In a book as wide-ranging as this, it is not surprising that some issues would appear to be better researched than others, and some important environmental topics receive scant attention. For instance, in the chapter on 'Climatic change' there is little discussion of the range of predicted values for the global temperature rise associated with a doubling of atmospheric CO<sub>2</sub>, and there should be some mention of the potential for cooling in northwest Europe as a result of

possible changes in ocean circulation that would reduce northward heat transport by the North Atlantic. There are also other chapters where some of the most interesting and controversial aspects surrounding the issue seem to be missing. The chapter on oceans, for example, would benefit from more detail on cod, perhaps alluding to the 1970s 'cod wars' between Britain and Iceland, and to current EU politics, and the chapter on natural hazards neglects high-magnitude events that have been the subject of much research lately, such as 'super-volcanoes', 'mega-tsunamis' and asteroid impacts.

Still, a book introducing environmental issues cannot possibly include everything that readers might like to see, and in comparison with the many other books published on this subject, it is written to a high standard and covers a lot of ground. Most people who have the first or second edition will want to replace it with this third edition. However, it is unfortunate that the printing of the third edition resulted in poorer quality diagrams and photographs. For instance, it is difficult to distinguish between shading on the map in Figure 2.4 in this edition, whereas it was perfectly clear in the first and second editions. Also the majority of photographs reproduced here lack the sharpness found in the previous editions, and they tend to be too dark. This is the only issue that would make me think twice about buying the third edition but, on balance, the expanded and updated content sufficiently compensates for the shortcomings in printing. Certainly the improved and re-organized lists of references and websites provide an excellent resource for researching topics further.

David E. Anderson  
Eton College

**Newell, J.** plus contributors 2004: *The Russian Far East. A reference guide for conservation and development*. McKinleyville CA: Daniel and Daniel Publishers. xx + 466 pp. US\$59.99 paper and US\$99.95 cloth. ISBN: 1 880284 75 8 paper and 1 880284 76 6 cloth.

The world may be getting smaller as communications accelerate and electronic media promote the virtues of distant lands but some corners of

this human-dominated planet remain relatively unknown, even mysterious. Such is the case of the Russian Far East (RFE), which comprises almost one-third of the Russian Federation at  $6.63 \times 10^6$  km<sup>2</sup> but which is home to only 7 million people. It is that part of northern Asia, a land of varied climate and ecology and of mountains and plateaux, adjoining Siberia to the west and the Sea of Okhotsk to the east. Like Siberia, it was littered with gulags, forced labour camps, between 1918 and 1956, which were home to millions of exiled Russians and which were consigned to history by the Nobel Laureate Aleksandr Solzhenitsyn's three-volume work *The Gulag archipelago* published between 1973 and 1975. Some place names will jog the memory for other reasons. For example, the air space of Sakhalin Island was invaded by a Korean airliner in August 1983 and was shot down by Soviet fighters, killing all 269 people on board. Kamchatka is a long peninsula that, with the Kurile Islands, divides the Sea of Okhotsk from the Pacific Ocean and is a region of active volcanoes as well as home to the world's largest population of brown bears. Then there is Vladivostok, the region's largest city and port, which is strategically located near the borders with China and North Korea, with Japan to the east beyond the Sea of Japan. In comparison with the deforestation of tropical regions, the sea level rise affecting island nations, the crises in the Middle East and the food shortages of sub-Saharan Africa, the RFE does not loom large in the popular or academic media. Yet it is a fascinating region with a natural wealth and beauty that is just as susceptible to destruction and exploitation as Amazonia, perhaps even more so because it has avoided the environmental spotlight.

Newell's book, with its many contributors and translators, provides a timely overview. It follows an earlier version published in 1997 entitled *The Russian Far East: forests, biodiversity hotspots, and industrial developments* but is much expanded to include detailed information on the RFE environment, its development, politics and economics. It is reminiscent of a gazetteer; a traveller would find it valuable, but it is more of a regional reference work because of its scientific and socioeconomic content. Following initial pages with descriptions of Siberia and the RFE, governmental structure, ministry and

agency responsibilities, ecological terms and associated Russian terms, there is an overview chapter for the region. Ten chapters follow, each documenting an RFE administrative unit. Throughout, the common structure involves initial summary pages containing key facts and then sections on ecology (including species inventory data, the protected area system and biodiversity hotspots), economy, sustainable development objectives, indigenous people, legal issues and a perspective. The authors are experts, the translations are good and there are numerous tables and diagrams and abundant maps. The many black and white photographs have reproduced well and the colour illustrations are a bonus.

To the environmental issues of the RFE, which have already received limited publicity, notably forest and energy exploitation, must be added the potential melting of permafrost, which is present in 75% of the area, and the problems of enforcing environmental legislation, which are as acute here as they are in many least developed countries. Such primary resources can be developed sustainably but only in a well-regulated economy free of corruption. While the world mourns the loss of biodiversity in the tropics, it seems oblivious to the demise of boreal forests in the RFE and the pollution caused by mineral and gas extraction. Since communism was replaced with a market economy in the former USSR, the RFE has witnessed considerable change. First, its resources are under increased pressure as it courts eastern Pacific Rim countries, rather than the rest of the Russian Federation that was its traditional market, for trade and income. Secondly, China, Japan and South Korea have welcomed the primary resources on offer while finding a new market for their own manufactured goods. Thirdly, the altered political scene has resulted in a weakened control of Federation government on resource exploitation but increased activities of NGOs and associations of local and indigenous people. All this promotes an uncertain future, at least environmentally if not politically.

This well organized and well presented book is reasonably priced. It documents a dynamic region and deserves to be widely used in tertiary-level environmental courses. However, lecturers will need to make an effort, in this

unfortunate and often counterproductive time of microspecialization, to make the unfamiliar familiar, but of course no RAE point or income will be generated.

A.M. Mannion  
Department of Geography  
University of Reading

**Robert, A.** 2003: *River processes: an introduction to fluvial dynamics*. London: Arnold. xvi + 214 pp. £50.00 cloth, £18.99 paper. ISBN: 0 340 76338 8 cloth, 0 340 76339 6 paper.

Approximately 150 years ago interest in fluvial dynamics had matured to the point where the emergent literature incorporated both scientific and observational knowledge. Taylor's (1851) *Enquiry into the operation of running streams and tidal waters* correctly portrayed the influence that flow resistance has on the generalized velocity profile and the position of the thalweg in a meandering stream. It also contained insightful descriptions of downstream fining, the sand-gravel transition, hiding and discussions of the distance required to wear down gravel, the rate at which heterogeneous bed materials move, the influence that the material on the river bed has on bed slope and energy expenditure. Beardmore's (1851) *Manual of hydrology* included tables to show the slopes that rivers of various sizes will assume under the laws of gravity influenced by friction of the bed, surface, mean and bottom velocities in order that the bottom velocity in artificial cuts should not exceed the permanent limit of the material through which they pass, and the flow of a variety of rivers. A decade later, Humphreys and Abbot (1861) published their compendious *Report upon the physics and hydraulics of the Mississippi River*, which included extensive reviews of the science of hydraulics as applied to rivers. Subsequently, by extending the range of thermodynamics into novel systems of nature and considering the mechanics of fluvial processes, in *Report on the Geology of the Henry Mountains* Gilbert (1877) demonstrated that variations in erosive power in any part of a river system would be translated, with varying effect, through the entire system as form became universally adjusted to process. Irrespective of their different operational perspectives, these

and a plethora of other publications stressed the importance of addressing the interaction between the movement of water and material surface over which it flows and, thus, of treating alluvial channels as the physical expression of three-dimensional, time-dependent water movement over a mobile boundary. This is also the issue that André Robert's book, *River processes*, seeks to address.

With the recent significant advances that have occurred in understanding of the structure of turbulent flow and its relation to sediment transport, *River processes* is a timely addition to the literature. The book, which is divided into six concise chapters, commences with a short introduction to the basic physical concepts involved in the explanation of fluvial processes and the physical processes in rivers that determine channel morphology. The second and third chapters address the basic principles of water flow and fluvial sediment transport. Both these complex topics are dealt with at a level that most advanced undergraduate and all graduate students should be comfortable with, and the references suggest more detailed topical papers and review articles that might form the basis for further directed studies (though some instructors may wish to augment the disconcertingly few citations from the pre-1970s literature). The fourth chapter deals with the specialist (sediment transport-related) topic of bedforms in both sand- and gravel-bed channels, though the link between this and the fifth chapter, which addresses the different bar types in meandering and braided channels (another sediment transport-related topic), is logical but not especially well formulated (the bridge between the two topics being provided by a cursory discussion of form roughness). Similarly, the topic of channel confluences is awkwardly (to this reviewer) appended to the end of the fifth chapter. The sixth and final (now perhaps inevitable) chapter, through brief discussions of their influence on aquatic vegetation, benthic organisms and fish populations, places fluvial processes in an applied context. However, discussions of pollutant transfer in and by water and sediment, important topics that might have served to reinforce the process linkage, are missing, and the book terminates somewhat abruptly with a discussion of hyporheic flow paths.