clude pseudocode to generate limit sets and, of course, Indra's pearls. (In a Buddhist sutra, the heaven of Indra is an infinite fine net strung with glistening pearls. The pearls reflect each other, with each reflection containing all other pearls and all the reflections of all other pearls.) The authors also include exploratory "projects" at the end of all but the final chapter. The last few chapters, especially the epilogue on hyperbolic geometry and Teichmüller theory, are more advanced and relate to the authors' current research.

Speaking as a mathematician, I can say that despite some initial reservations about the authors' style, I truly enjoyed reading *Indra's Pearls*. I am sure that the book will have a major impact on the way we teach geometry and dynamics. In fact, I am already thinking about designing a senior- or graduate-level course based on some of the ideas presented by Mumford, Series, and Wright. Although *Indra's Pearls* is not an easy read (but then neither is Joyce's *Ulysses*), it is nonetheless a jewel that will more than repay the persistent reader's efforts.

ENVIRONMENT

(Almost) All About Biodiversity

Osvaldo E. Sala

Only in recent decades have humans started to realize the tremendous impact that their activity has had on the other species with which they share planet Earth. Human activity has resulted in rapid changes in Earth's surface, the composition of its atmosphere, its climate, and the diversity of its organisms. Humans have increased the rate of species extinction by two orders of magnitude, mostly as a result of land-use change and habitat destruction. Indeed, we are currently in the sixth major event of mass species extinctions in the history of life on Earth. Whereas previous episodes were the result of megacatastrophes such as the hypothesized meteorite impacts, the current mass extinction event results almost exclusively from human activity. The logging of forests and the plowing of grasslands to grow crops and build cities and roads have had major effects on the diversity of plants, animals, and microorganisms. Similarly, introduction of alien species and effluents from intensive agriculture, urbanization, and industrialization have altered aquatic and terrestrial biodiversity. Only recently have we realized that many of the disappearing species are essential to human well-being. The diversity of species is key for the provision of food, fiber, and clean water, as well as for the maintenance of the composition of the atmosphere and the stability of climate. The biodiversity crisis led the nations of the world to gather in 1992 in Rio de Janeiro in a global summit that resulted in the signing of the Convention on Biodiversity. Ten years later, another global summit met in Johannesburg to evaluate the progress since and discuss how humans may alleviate poverty and achieve sustainable development.

World Atlas of Biodiversity
Earth's Living Resources in the 21st Century
by Brian Groombridge and Martin D. Jenkins

University of California Press, Berkeley, in association with UNEP World Conservation Monitoring Centre, Cambridge, 2002. $54.95, £37.95. ISBN 0-520-23668-8.

The *World Atlas of Biodiversity*, by Brian Groombridge and Martin Jenkins of the United Nations Environment Programme World Conservation Monitoring Centre in Cambridge, United Kingdom, originated as a contribution to the 2002 Johannesburg summit. Thumbing through the pages of this beautiful and well-produced book gives one pleasure and an urge to own it. The volume is an atlas about biodiversity, as its title correctly indicates; it comprises colorful maps, instructive tables, and attractive illustrations accompanied by explanatory text. The short chapters in the first part of the book offer broad introductions to the way ecosystems operate and to the origin and maintenance of biodiversity. The core of the book is three longer chapters that characterize the biodiversity of terrestrial, marine, and freshwater environments. The volume will appeal to a wide-ranging audience, from scholars and students to policy makers. Its many maps and tables are an extraordinary source of important facts about biodiversity; readers will find themselves often consulting the work when they prepare a lecture, write a paper, or draft legislation.

The authors present a broad view of global biodiversity, and their account allows the reader to make interesting comparisons across different ecosystems. For example, comparisons between marine and terrestrial biodiversity indicate that the oceans, which occupy the largest fraction of Earth's surface, possess only a small fraction of the global species diversity. In contrast, despite the low levels of species diversity of marine systems compared with terrestrial environments, marine diversity measured for more inclusive categories in the taxonomic hierarchy, such as phyla, is much higher. This pattern poses exciting evolutionary questions. Present-day extinction rates also differ considerably between marine and terrestrial systems, with higher rates in terrestrial systems. The authors suggest that this difference is primarily due to two circumstances: that humans do not live in the oceans (and thus have altered them less than terrestrial ecosystems) and that there are fewer barriers to dispersal in the oceans.

Altered Patagonia. The human impact on Patagonian biodiversity has included the introduction of domestic animals and invasive alien plants such as *Bromus tectorum*.

Some readers may be disappointed that the *Atlas* includes very little about the diversity of microorganisms. The coverage in the volume is biased toward plants and animals and their distributions in biomes and ecosystem types. The authors' rationale for focusing on macroscopic organisms is that humans predominantly manage at coarser scales—adding, modifying, or deleting plant and animal species. Although this is most frequently the case, microorganisms are unquestionably important for the functioning of ecosystems and for their ability to provide goods and services to humans. And in many instances, humans do manage microorganisms directly via pesticides or indirectly when altering ecosystem structure.

With its rich supply of information, the *Atlas* is likely to become a landmark in the biodiversity literature. It highlights the increasing recognition that the documentation and conservation of biodiversity are gaining in global, national, and local agendas. The realization of the value of biodiversity involves two steps: visualizing the complexity of biological resources and understanding the role that the diversity of organisms play in the functioning of Earth's systems. The *World Atlas of Biodiversity* makes a great contribution to the first step.

The author is in the Department of Ecology and Instituto de Investigaciones Fisiológicas y Ecológicas Vinculadas a la Agricultura, Faculty of Agronomy, University of Buenos Aires and Consejo Nacional de Investigaciones Científicas y Técnicas, Buenos Aires 1417, Argentina. E-mail: sala@ifeva.edu.ar

CREDIT: OSVALDO E. SALA