

# BOOK REVIEWS

## Ecological Accountancy

**Nature's Services.** Societal Dependence on Natural Ecosystems. GRETCHEN C. DAILY, Ed. Island Press, Washington, DC, 1997. xx, 392 pp., illus. \$49.95, ISBN 1-55963-475-8; paper, \$24.95, ISBN 1-55963-476-6.

Just how valuable is nature? One of the misfortunes of modern environmentalism is that the serious, respectable scientists have not spent much time trying to answer this question. Indeed, to many the question itself is vulgar and redundant, because serious scientists ought not to be troubled with stating the obvious. Where the respectable fear to tread, the ill-informed fill their shoes, which is why we have uninformed environmental campaigns. Scientific indifference to the question accounts, in part at least, for the fact that nature is disappearing, fast. And unless someone tells us why nature is valuable and, just as important, how we are to capture those values so that they show up in the everyday calculus of economic, social, and political decision-making, then there will be less and less nature for the future.

This volume of essays sets out to provide answers to the question of value. Gretchen Daily begins sensibly by running up a menu of ecosystem services: the cleansing of air and water, regulation of watersheds, waste treatment, renewal of soil fertility, pollination, pest control, seed dispersal, maintenance of biological diversity, climate and ultraviolet radiation regulation, provision of human culture, aesthetic beauty and intellectual stimulation. To these she might have added the provision of food, shelter, fodder, medicines—all the “free” wealth of the wild. Harold Mooney and Paul Ehrlich offer a brief history of concern about ecosystem services, concluding that we seem to have learned little since George Perkins Marsh expressed his concern about the depletion of natural capital over a hundred years ago. Diffusing these concerns throughout the millions of decision-makers who daily convert this natural capital to something else is the subject of an unfortunate debate, unfortunate because it diverts energy into unproductive disputes. At one extreme are those who argue for a “moral revolution,” a blossoming of concern for nature, perhaps through education and campaigns of moral suasion. At the other are those who argue that nature

disappears because it has no “price,” no economic value. If a hectare of land is worth \$2000 as agricultural land and nothing as wilderness, its fate is inevitable. But if wilderness were saleable, what then? Several of the essays deal directly with or touch upon this issue. Lawrence Goulder and Donald Kennedy elegantly set out the basics of placing monetary values of human preferences for environmental assets, and this easy-to-read introduction to complex methodology is to be highly recommended. Robert Costanza and Carl Folke traverse some dubious ground in questioning the role to be played by human preferences in valuing ecosystem services. Noting that preferences can and do change over time, and indeed may change during the process of decision-making, they opt for a process whereby preferences are (openly) manipulated in a democratic process. This sounds politically correct, but real-world democratic processes are, of course, the instruments of the powerful, and it is precisely because we know they are not reflective of individuals’ wishes that economists opt for the consumer sovereignty paradigm, warts and all.

Susan Alexander, Stephen Schneider, and Kalen Lagerquist focus on climate and its economic value. They look at the economic costs of extreme weather events in the American Midwest and then at the economic value of carbon as the source of warming damage. This part of their essay is unfortunately very dated, having been superseded by the work of the Intergovernmental Panel on Climate Change, but it is good to see scientists affording the economists’ work some credibility, even if they find it “highly unsatisfying.” In what is probably the best essay in the book, David Tilman looks at biodiversity and provides a valuable summary of the 40-year debate on the contribution that diversity makes to stability of ecosystems. He concludes from empirical work that biodiversity has an “insurance value” in that it minimizes the damages from unpredictable events but that diversity has little to do with variability in individual component populations. Gretchen Daily, Pamela Matson, and Peter Vitousek consider the ecosystem services supplied by soil: regulation of the hydrological cycle, the physical and nutrient basis of plant life, and the context for the decomposition of organic waste, for example. But do we need all these ecosys-

tems? The authors hypothesize what the cost of nitrogen fertilizer to replace existing natural nitrogen capture in soils would be and come to a figure of \$320 billion a year. Unfortunately, these calculations commit the basic error of confusing marginal and total values, an error that Goulder and Kennedy warn against in their essay. Imagine what the price of artificial fertilizer would be if it suddenly was required to replace all natural nitrogen use!

Other essays deal with pollination and the little-publicized crisis of the decline in honeybees; natural pest control, with a range of economic values from \$54 billion to \$1 trillion; marine and freshwater ecosystems, and the world’s forests and grasslands. The book ends with some brief case studies. Overall, this is a fine volume that makes a first cut at accounting for the value of ecosystems. The idea of listing and, where possible, measuring ecosystem values is not new, but having so much information on this activity brought together in one book is novel and rewarding.

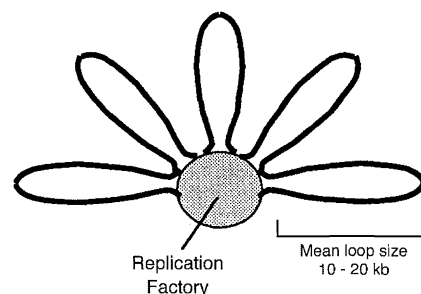
**David Pearce**

*Centre for Social and Economic Research  
on the Global Environment,  
University College London,  
London WC1E 6BT, UK*

## Cells and Replicons

**Eukaryotic DNA Replication.** J. JULIAN BLOW, Ed. IRL (Oxford University Press), New York, 1996. xx, 232 pp., illus. \$105 or £65, ISBN 0-19-963586-2; paper, \$55 or £29.95, ISBN 0-19-963585-4. *Frontiers in Molecular Biology*, 15.

The elucidation of the mechanisms of DNA replication has been a key focus of biological research since it was discovered in 1953 that implicit within the structure of DNA was a simple solution to its faithful propagation. The basic enzymology of the process was



“Cartoon to show a possible role for chromosome looping in generating a relatively constant replicon size in the *Xenopus* system.” [From Blow’s chapter in *Eukaryotic DNA Replication*]