fying strategies of sustainable development that balance the satisfaction of human needs with the long-term maintenance of environmental functions" (p. 3). This attitude toward the problem should certainly be welcome among readers of *Ecological Economics*.

The six versions of the SEEA represent a gradual incorporation into the SNA of more and more of the ecological point of view. The report acknowledges the mutual interdependence of physical data about environmental stocks and flows (as expressed, for example, in materials/energy balances) and monetary data on the value of those stocks and flows (as expressed, for example, through the valuation of environmental stocks and flows). It also stresses the importance of fully integrating the physical and monetary data.

Chapters 2–5 detail the various versions of the SEEA with some examples, while chapter 6 deals with issues of implementation. The potential users of the handbook are thus given a range of alternatives along a consistent spectrum from which to choose, depending on their needs and capabilities. There is also the assumption that with time more countries will implement higher versions of the system, and that the system itself will evolve and improve with use. This evolutionary approach is essential. There will always be quibbles and uncertainties about such a complex endeavor. The point is to lay the conceptual groundwork and start the ball rolling. One can then "learn through doing" rather than waiting for all the issues to be worked out ahead of time.

If the system is flexible and adaptable, then improvements can be made with time and use. For example, one element left out of the current versions is the issue of dealing with data of radically different quality in the same framework. One needs to have some way to rank or "grade" data so that its underlying uncertainty and quality can be honestly communicated and incorporated into the interpretation of conclusions (Costanza et al., 1992). There are several possible ways of doing this, but the SEEA framework seems open and flexible enough to allow this kind of elaboration.

In summary, the UN's new SEEA accounting system represents a pathbreaking event in the ongoing effort to integrate the study of ecological and economic systems. It is a "must read" for anyone concerned with ecological economics.

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From Catastrophe to Chaos

From Catastrophe to Chaos: A General Theory of Economic Discontinuities. J. Barkley Rosser, Jr. 1991, Kluwer, Dordrecht, 402 pp., ISBN 0-7923-9157-8.

This book covers so much ground that it is difficult to characterize. It basically takes the ideas of discontinuous change, chaotic dynamics, and catastrophe theory and applies them to almost every major area of interest to economists, and to many areas that are of special interest to ecologists and ecological economists. Its chapter titles range from "discontinuities in microeconomic systems" to "chaos theory and macroeconomics", to "discontinuous evolution of urban historical forms", to "perspectives on economic and ecologic evolution", to "ecosystems and economics", to "the limits to growth and global catastrophe revisited." Throughout it all, Dr. Rosser maintains an engaging and highly readable, if somewhat eclectic, style that is accessible to both the mathematical and non-mathematical reader alike. The breadth of material he is attempting to synthesize is truly staggering, encompassing all branches of economics and many branches of ecology, along with a few twigs from other disciplines. Just to give some idea of this range, the list of references is 62 densely-packed pages (a full 15% of the book).

One can ask whether the book lives up to its ambitious subtitle. Does it really provide "a general theory of economic discontinuities"? I think not, at least not in the sense that I have of what constitutes a general theory. What it does provide is a rather thorough

catalog of the many examples of discontinuous, chaotic, and catastrophic behavior in economic and ecological systems, and some attempt to categorize these examples (for example, into large-scale catastrophic discontinuities and small-scale chaotic discontinuities). But it falls short of providing a model that is in any sense predictive of when, where, and why these behaviors occur and how they interact with zones of more continuous behavior. What is needed is something more along the lines of Holling's (1987, 1992) model of the four general system functions (exploitation, conservation, release, and reorganization) and the changing patterns of dominance of these functions. According to Holling, discontinuous dynamics and rapid evolutionary changes occur mainly during the "release" or "creative destruction" stage of system evolution, with the other stages being dominated by more continuous dynamics.

This approach seems a promising one in modeling complex ecological economic systems (Costanza et al., 1993). Maybe combining Holling's model with Rosser's extensive data base of examples would yield the sought after general theory. But actually, I think the value of Rosser's book lies in its documenting and analyzing these many examples, allowing the reader to come to his or her own conclusions about what they mean and how they fit together. I would have simply changed the subtitle to something a little less pretentious. A "catalog of discontinuous behaviors in economic and ecological systems" would have been a more accurate subtitle. The book is still an enormous contribution to ecological economics, however, and well worth reading. It drives home the point that discontinuous change is a fact of the behavior of complex systems, including ecological and economic systems. To continue to treat these systems as always continuous is courting disaster. There is much more to do before a "general theory" is produced, but Rosser's book is a necessary first step.

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