this might be possible; on the public lands, every decision becomes, literally, a federal matter in which every citizen has an equal say. These are political institutions, not economic ones. Financing such projects will be a hard slog.

Much of the book's authority lies in its comprehensiveness. Its power, however, lies in its humility. This is not the Holy Writ of ideologues. The contributors recognize the limitations of knowledge, of all kinds; the limitations of institutions, including those they work for; the limitations of any honest experiment, in a world built on surprise, contingency, and unknowable issues. Their ''formula'' is one of endless social conversation, relentless research, and tireless accommodation. They make no claims for restoration prescriptions beyond the domain of ponderosa in the Southwest. Yet they recognize that action cannot wait for the chimera of perfect knowledge. ''Knowing what we now know,'' Covington and Vosick conclude, ''it would be grossly negligent for our generation not to move forward with large-scale restoration of southwestern ponderosa pine forests.'' The only answer to that *cri de coeur* is a superior alternative for remaking forests. At the moment, none exists. This book goes a long way to explain why.

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The Economics of Waste
Richard C. Porter, RFF Press, Washington DC, 2002, ISBN: 1891853430, 314 pp.

Richard Porter must have been a wonderful teacher. Recently retired from the University of Michigan, where he taught environmental economics for 30 years, he has assembled and greatly expanded his class notes into *The Economics of Waste*. Years ago, finding that many economics students lacked the science background to analyze air and water pollution, he decided to focus on municipal waste and transportation as more accessible examples.[1] The result, in this book, is a comprehensive treatment of the economic problems of waste management, disposal, recycling, and related issues, written in the comfortably casual voice of someone who loves to explain things, and does it well.

This is at once a very good book, and a frustrating one: in short, good on waste, frustrating on economic theory. The good news is that Porter does an outstanding job of conveying the reality of solid waste and how it is handled today. He covers not only the limited academic writing on the subject, but also the much more extensive world of empirical knowledge of waste problems, as found in EPA and state agency reports, the trade press, and consultant studies. (In the interests of full disclosure, I should note that I am one dozens of people whom Porter thanks in his preface, and my work is discussed at several points in his book, generally quite favorably. When Porter showed me the manuscript, I objected to a passage criticizing my work; in the published version that passage now ends with a gracious statement of how I might see the issue differently.)

Interesting examples are scattered throughout; for instance, the threat of hazardous or ''dirty recycling'' in developing countries is illustrated with an account of shipbreaking, the manual disassembly of scrapped oceangoing ships in India. Numerous examples draw on Michigan, or Ann Arbor, experience, which was readily at hand for Porter and his students. It is fortunate that Michigan is a bottle bill state, and that Ann Arbor has one of the nation's most ambitious and successful recycling programs; as a result, Porter's place-based analysis of waste turns out to be unusually relevant for public policy elsewhere. A possible idiosyncrasy of location is Porter's finding that a large nearby landfill is located in a community of above-average incomes. He maintains (implausibly, I think) that this might be typical of broader experience, and might provide grounds to dismiss environmental justice concerns about landfill siting.

The frustrating aspect of the book is that Porter's treatment of economic theory is not nearly as creative as his examination of waste. He says at the

[1] Porter's not on transportation similarly gave rise to his earlier book, *Economics at the Wheel: The Costs of Cars and Drivers* (Academic Press, 1999).

outset that the book is as much a vehicle for teaching economics as an analysis of waste per se. Yet he treats economics as received doctrine, in which the environment is adequately addressed by minor tweaking of the market: "thinking economically means trying to get the prices right" (p. 7) and creating market incentives that lead individuals and businesses to the optimal outcome. Cost–benefit analysis, incorporating estimated values for one or a few salient externalities, is the way to evaluate public policies if you are "thinking economically."

Perhaps as a result of simplifying the exposition for undergraduates, his cost–benefit analysis often collapses into an even more reductionist cost-effectiveness standard, comparing the cost per life saved by various policies. Porter estimates the cost per life saved by EPA's landfill regulations, concluding that it is orders of magnitude higher than what society normally spends on saving lives. Then, although he mentions several reasonable qualifications, his final thought on the subject is to wonder how many more lives could be saved if the same amount of money were spent elsewhere (pp. 64–65).

This type of argument—which is of course not unique to Porter—rests on a series of flawed assumptions. It assumes that all relevant externalities have been quantified; that all benefits consist of lives saved; that society should spend the same amount per life saved in every area; and that the resources spent on compliance with regulations (which are largely private expenditures) could be transferred from one industry to another.[2] Typically, many or all of these assumptions are false, making the analysis of environmental policy more challenging and less quantitatively precise.

There are occasional signs of a more complex and subtle understanding, peeking out through Porter's conventional theoretical framework. When his sketch of a cost–benefit analysis of Ann Arbor's recycling program suggests that the costs exceed the benefits, he comes up with a list of reasons why it still might be a worthwhile program. Revenues are volatile, costs are hard to estimate, several categories of benefits were not included, the program may be engaged in "learning by doing," bringing costs down over time, and so forth (pp. 143–46). This all amounts to a persuasive defense of Ann Arbor's recycling program, despite the negative cost–benefit evaluation. What's missing is any reflection on the theoretical significance of the fact that cost-benefit analysis led to an unreasonable answer to this important question.

In summary, this is an indispensable book for anyone interested in the economics of waste today. And for those who are determined to learn, or teach, a traditional approach to environmental economics, it would undoubtedly be more fun to use Porter's well-narrated, real-world examples rather than the contrived, abstract stories that fill so many economics textbooks. But Porter did so well in describing the world of waste that I was hoping for comparable innovations in the theory with which he interpreted the data. Perhaps in his next book.

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[2] For explanation of these and related ideas, the limitations of externality valuation and cost–benefit analysis, see Frank Ackerman and Lisa Heinzerling, *Priceless: On knowing the Price of Everything and the Value of Nothing* (New York: The New Press, 2004).