

BOOK REVIEWS

Conservation: Linking Ecology, Economics and Culture

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REVIEWED BY DAN BROCKINGTON

This is an ambitious book. Its bold title alone portends much material, and the heated debates it has to summarize make its work difficult. The unproductive split between strong conservation activists and the human rights lobby has made interdisciplinary approaches to conservation hard. Indeed the authors contend that “even writers who sincerely strive for balance end up stacking the deck one way or the other” (p. xiv). Their goal, therefore, is to provide a uniquely even-handed account of the main debates in the conservation of natural resources, which will make interdisciplinary learning and clear debate possible.

The result is, in many ways, a treat. It is wonderfully written. The prose is clear and well structured; complex concepts or complicated histories are fully comprehensible. It is also calm and reasoned, ably tackling most fraught debates with a good blend of common sense and unarguable logic. It is also incredibly rich, by far the best available for diversity of case material. The text is well illustrated with detailed boxes, good pictures and clear, legible figures and tables.

The book comprises eleven chapters. The first three introduce the arguments examined, histories of conservation, and examine changes in ecological thinking behind changing conservation thinking. The bulk of the text is devoted to six substantive chapters

on burning issues in conservation debates—the role of self-interest, indigenous peoples, collective action and local use in conservation, as well as insights from political ecology and the influence of international policies and economic approaches. The final two chapters examine diverse solutions, both common and innovative, to conservation dilemmas.

The quality of discussion is almost universally strong. Frequently the authors’ achievement in these pages is to refocus attention away from unproductive contentions to much more interesting, and more productive, questions. The high point is the chapter on self-interest, which examines conservation behavior from an evolutionary perspective. For anyone interested in evolutionary anthropology, this is a must. Other strong points are the discussion on collective action, ecological theory and the final examination of different attempts to address conservation problems. The authors repeatedly go right to the cutting edge, particularly with respect to ecological issues. They rightly observe that evaluations of community-based conservation have not really monitored their ecological outcomes, and that the crucial ecological comparisons between traditional parks and new conservation measures (pp. 50 and 240) on the impacts of hunting (p. 95) and collective action (p. 129) have yet to be undertaken.

Yet there are weaknesses. Despite the centrality of protected areas to this book (p. xv), its data on protected area establishment are seriously dated; the substantial recent revisions to the World Database on Protected Areas are absent (<http://sea.unep-wcmc.org>). More seriously, given its intended scope and even-handedness, there are some surprising omissions. There is no mention of the role of ideology and myth in shaping conservation policy; Cronon (1995), Adams and McShane (1992), and Brockington (2002) are not in the references. It does not engage with recent disagreements about poverty and conservation, and, astonishingly, there is no mention of the controversies surrounding the role of international conservation organizations or the problem of accountability in non-governmental organizations (Jepson 2004). This is part of a wider

silence on the role of civil society in affecting the social changes upon which conservation depends. And this in turn is part of a lack of detailed discussion about devolution. These can be key components in new conservation measures, and readers will require a better introduction to them.

Occasionally the balance is lost. Despite observing the lack of rigorous ecological comparisons between protected areas and alternative conservation strategies (pp. 50 and 240), the authors still conclude that “establishing protected areas remains the front line of the battle to conserve biodiversity” (p. 241). When discussing park outreach programs, they fail to clearly ask whether their benefits meet the costs parks can impose. Perhaps most seriously, they are just plain wrong about work on the social impacts of protected areas. There is not, as the authors claim, a “massive cataloguing of past, recent and ongoing abuses” of protected areas (p. 36). The complaints against protected areas are shrill and prominent, and undoubtedly appear ‘massive’ to some conservationists. But actual studies are few (particularly compared to the number of protected areas), and good research more rare; the noise conceals sparse data. Indeed a systematic cataloguing of the social impacts of protected areas (benefits and costs) is precisely what is now required (Brockington and Schmidt-Soltau 2004). And when the authors state that “[c]ontinuing attempts to displace resident populations, now through enticements rather than threats, will need very careful monitoring” (p. 36), I infer that eviction will no longer be the norm. But we simply cannot tell how the issue of continued widespread human residence inside strictly protected areas will be resolved in different parts of the world. These flaws mar an otherwise strong chapter.

In all, however, these problems are not too serious because bias is unavoidable. We can strive for balance but ultimately have to throw in our ideas for criticism, which the authors have done. All they have really failed to do is to declare their backgrounds (where have they got their authority from? what experiences drive them?) and reflect on their predilections. So what if subjects are missing? There are plenty of social scientists better qualified

to introduce them. The challenge now is for them to do so and to match the clarity and balanced tone of these writers. So if, given its ambition, this may not be the book its authors would like it to be, their failure still leaves conservation much richer. With its diversity, logic and straightforwardness, this book is the benchmark in the field. If subsequent writings can even attempt these standards then the interdisciplinary co-operation the authors foster will undoubtedly become easier.

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The End of Oil: On the Edge of a Perilous New World

PAUL ROBERTS

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REVIEWED BY JIM IGOE

The End of Oil is a semi-popular book written by an investigative journalist. Why should such a book be reviewed in the *Journal of Ecological Anthropology*? It is my considered opinion that good investigative journalism rivals ethnography in many ways, especially in cases where journalists spend significant time in the places they are reporting about. An example of this type of work is Michael Maren's *Road to Hell* (1997), a scathing account of the global development industry. Raymond Bonner provides an equally trenchant and well researched critique of the global conservation industry in his book, *At the Hand of Man* (1993). Another favorite of mine is *Fast Food Nation* (2001) by Eric Schlosser, which provides a compelling account of the impacts of the fast food industry on American culture, and especially the agricultural economy. What these works may lack in ethnographic connection and theoretical analysis they make up for in accessibility—in distilling complex issues for a popular audience without compromising their complexity. I have used all of these books in the courses that I teach. Not only do students respond very positively to them, they are also able to relate their detail to the ideas of theorists like Marx, Foucault, and others.

The End of Oil is an especially salient example of this type of work. While a bit long on detail and a bit short on organization (a shortcoming of which many of my favorite ethnographies are equally guilty), it is definitely the most far-reaching and accessible work on the global oil economy I

have ever read. The book addresses issues that I originally learned about in an unfortunately obscure book called *Beyond Oil* (Gever et al. 1986). This book, out of print since the early 1990s, pointed to the early warning signs of our current geo-political crisis, as well as the difficulties inherent in the inevitable transition to alternative fuel. It almost goes without saying that the need for this kind of insight and analysis is more pressing today than ever before—so I was delighted to see a popular book that repeats the most important insights of *Beyond Oil*. Furthermore, *The End of Oil* has direct relevance for anthropological theory, especially the works of Leslie White and Sydney Mintz.

I was especially struck by how much this book illuminates White's 'Energy and the Evolution of Culture' (1943) as well as demonstrating its continued relevance to the present day. In this article, White argued that the capture of energy from the environment is the foundation of human culture. Roberts' descriptions and explanations of how we capture energy from the environment instilled me with a new appreciation for the significance of this seemingly facile observation. In an extraordinarily accessible passage, Roberts explains that most of the ways we capture energy have to do with breaking the bond between carbon and hydrogen to capture energy produced through photosynthesis or metabolism—energy that has been stored in the earth by binding with carbon.

Just as White argued in 1943, Roberts explains that the increasing efficiency of human technology in capturing this stored energy has driven cultural change over time; for the most part this change has occurred in leaps rather than in increments. Specifically, Roberts traces the global capitalist economy to the invention of the engine in the 18th century. As an 'automatic self-acting device' the engine was capable of transforming chemical energy into physical work and to do it anywhere that fuel was available. More importantly, the engine could be used to capture energy from the environment in the form of fuel and to transport that fuel anywhere that work needed to be done. As long as fuel sources are abundant, it does not even matter if engines are especially efficient at doing this work. All that

matters is that more energy is captured from the environment than is lost as heat by the engine doing the work.

This process was described by White in his equation: $E \times F = P$, in which E represents the amount of energy captured from the environment, F represents the efficiency of human technology in capturing this energy, and P represents the product—the total goods and service that this process provides to a particular society. Roberts' historical account illustrates that the global economic growth of the past two centuries has been driven primarily by increased energy capture and increased technological efficiency. In the U.S., the E in the equation has been especially salient as we have discovered increasingly energy abundant sources of fuel (wood \rightarrow coal \rightarrow oil). During the oil shocks of the 1970s, we demonstrated that we could also bring about economic growth through increased fuel efficiency, although this was an unfortunately short-lived historical moment.

The problem with this scenario, however, was the dominant role of E in U.S. history. To put it simply, our culture and national infrastructure reflect our misplaced perception that we have been sitting on top of an inexhaustible supply of fossil fuels. Here Roberts departs with White's more optimistic prediction that new sources of energy combined with technological innovations would allow economic growth to continue unabated into the future. The details of Roberts' work clearly illustrate that White's predictions are not coming true. Our inability to move 'beyond oil,' in spite of the fact that we are clearly coming to 'the end of oil,' is definitely reflective of what White would have called 'social inertia.' It is unlikely, however, that this 'social inertia' will be overcome by technology as White predicted. As Roberts aptly demonstrates, future moves to alternative fuels represent a fundamentally different proposition than our previous fuel revolutions (e.g., moving from wood to coal). These differences have to do with the nature of oil as an energy source.

This is where the analysis of Sydney Mintz comes into the picture. In his book, *Sweetness and Power* (1985), Mintz traces the rise of sugar in Europe and the U.S. as part of the industrial revolution and the

spread of global capitalism. As a food source that is almost pure energy and easily portable, sugar was ideally suited for industrial capitalism. It provided workers with a cheap source of energy, the portability of which would minimize their time away from their machines. As if this were not enough, sugar also tastes good and is highly addictive. Once people had a taste, they would want more and would gladly pay their hard earned wages to procure it. This was a double win for capitalism: 1) a highly energized work force; and 2) a profitable commodity to sell to them. Mintz further explains that this ongoing historical relationship severely limits our choices today. When it comes time to decide what to eat, sugar and other highly processed foods are usually our only choices—or at least they appear to be our only choices in the context of our hectic workaday world.

In the course of teaching *Beyond Oil*, I realized that the same argument could be applied to fossil fuels (hydrocarbons as apposed to carbohydrates). Oil's high energy content, viscosity, and portability made it an ideal fuel for an expanding capitalist economy. The fact that early oil deposits were large, and so highly pressurized that they literally shot out of the ground, created the impression that it was an unlimited resource. Our acquired taste for abundant and readily available fossil fuels will not easily be overcome. New alternatives are not nearly as attractive, and the global infrastructure that we have built around oil will not be easily converted to other fuel sources. Even in the face of rapid global warming, Roberts questions whether we will find the political will to wean ourselves from oil before it is too late.

Finally, however, he does offer some hopeful scenarios. Specifically he points out that we have not nearly begun to tap the potential of increased fuel efficiency. If our experience in the 1970s is anything to go by, the U.S. could save more fuel than what currently remains in our untapped domestic oil reserves. As such, increased technological efficiency (the F in White's equation) could in fact buy us time to develop alternative energy sources. The key he concludes is to move beyond being a society of 'energy illiterates' to one in which people are increasingly aware of the energy costs of their activities. His book represents an important, albeit small, step in that direction.

Significantly, from my perspective, Roberts does not appear aware of the works of anthropologists like White and Mintz. Nevertheless, his book presents a concrete and accessible account of theories that are usually too abstract and erudite for the average person to engage. I find this achievement heartening for two reasons. First, it demonstrates that anthropological theory can be used to explain real world problems and suggest solutions to them. Second, it suggests that anthropologists still have a potential role as public intellectuals, if only we would stop talking to each other and begin addressing the public. This, I believe, is journalism's most important lesson for anthropology.

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The Power of the Machine: Global Inequalities of Economy, Technology, and Environment

ALF HORNBERG

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PAPERBACK

REVIEWED BY ERIC C. JONES

Hornborg's book—a seamlessly organized collection of his previously published articles—asks this question: What is the source of the world's current ecological crises? His answer is the familiar bogeyman of capitalism and its henchman *money*. But his explanation of that answer is quite innovative, and has the potential to help build a framework that would be a theoretical breakthrough for understanding human-environment relations. In addition to standard positivist arguments, he also incorporates many concepts and analytical techniques from post-structural theory. He applies these perspectives to the broad scope of global economics and the ubiquity of environmental degradation—and specifically individuals involved in everyday relationships of production, distribution and consumption. Because of its subject matter and innovative approaches, this book should be read by all economic and ecological anthropologists and would provide good material for teachers of upper division classes in those fields, although the book addresses questions that are pressing in virtually all of the social sciences.

In response to a growing literature that wants to push the origins of the process of wealth accumulation back at least 5000 years (see Gills and Frank 1990), the book argues for discontinuities in the modes of wealth accumulation, which are plunder, merchant capitalism, financial capitalism, undercompensation of labor, and underpayment for natural resources (unsustainable extraction). Industrial capitalism is a particular arrangement of these modes that threatens sustainability in a way

that others have not. By Hornborg's definition, all modes of accumulation structure the appropriative processes (via tools), transformative processes (of raw materials) and convertible processes (creation of valuables and consumables). The implication of this theory is that all modes of accumulation have, at base, one thing in common: some minimum net transfer of wealth from one sector of society to another is assured by people's evaluations that support a certain rate of exchange. The latter part sounds almost circular and seems to resemble the rationale of neoclassical economics, i.e., people believe that the trading they are doing is fair (otherwise they wouldn't do it). Combined along with the net transfer of wealth, the ramification is that accumulation, i.e., the existence of haves and have-lesses, is fundamental to complex society, that both the haves and the have-lesses develop beliefs that help maintain the system, and that these beliefs often include hopefulness about the Power of the Machine to solve problems. Drawing from the Second Law of Thermodynamics, Hornborg also tries to join political economy and bioecology first by labeling Marx's and H.T. Odum's analyses of alternative currencies (labor and energy, respectively) as normative theories, second by finding that the energy that remains in a finished product is inversely proportional to the increase in its value. Thus, urban centers of accumulation contain less potential energy, but higher value, and are the result of accumulative processes that exploit human labor and unsustainably mine the biophysical environment. This argument parallels Harvey's (1985) idea of the 'spatial fix', in which capital will always seek places where the global terms of trade can find a cheaper cost of production. Hornborg would emphasize that it does not take less energy to mine the ground in one place than another, and it does not take less muscle or finesse to build a tool in one place than another. If labor and capital costs were equalized across the planet, economic growth would be limited even more than it is now. Thus, it might follow that industrial capitalism always depends upon, and co-exists with, the other modes of accumulation to maintain unequal global terms of trade. Industry is only the latest material

arrangement of the modes of accumulation, while wage labor is the most recent cultural arrangement of the modes of accumulation.

The book asserts that the core of the problem of environmental and economic unsustainability under industrial capitalism is that the dominant use of general purpose money (Marx's D form of exchange value) excludes the use of other ways of compensation that would not accelerate production at such a high rate. Industrial capitalism both promotes and requires growth, and at some point, growth is unsustainable economically due to the inherent limits of human consumption, as well as the limited ability of the environment to support continuous economic growth. The techno fix is not a solution; it is an illusion. Significantly, the book's discussion of these familiar tenets blames not only capitalists, but all human participants in complex society.

And the blame does not lie just with human behavior, but also with human cognition. Here, the book is not worried about a false consciousness, but about two special qualities of human cognition. The first of these is the innate human sense of reciprocity that creates expectations and obligations that are at the foundation of human society (Mauss 1990 [1925]). Hornborg here also draws from much of Godelier's work on exchange, although *The Power of the Machine* does not engage the groundbreaking *The Enigma of the Gift* (Godelier 1999). Industrial capitalism tends toward a global economic system that lacks insulated protection for communities, thus destroying the bases for reciprocity and forcing greater reliance on general purpose money. Secondly, Hornborg is interested in the human obsession with tools and new technology—'the fetishization of the machine.' Although not addressed in the book, this tendency of humans as toolmakers might be better subsumed under externalized cognition—a broader human pattern that includes tools, language and most forms of labor (see Gumperz and Levinson 1991; Hutchins 1995). This would show how our fascination with machines is inherent to human culture, and how it allows certain economic systems to increase the net transfer of wealth from one part of society to another.

While these processes have obvious implications for the sustainability of human societies, Hornborg does not think that the problem of sustainability will be solved by reducing reliance on technology; technological change is fundamental to human society. Rather, he argues, the key to sustainability lies with reducing the dominance of general purpose money. Otherwise, our worship of machines, when combined with certain arrangements of the modes of accumulation such as industrialism and wage labor, necessarily result in unsustainability. The way to reduce the predominance of general purpose money is by supporting other forms of exchange, which do not allow for such rapid accumulation of wealth—perhaps by the very forms of exchange that people in anti-systemic movements advocate.

Hornborg supports this theory with data from his own ethnographic study of native resistance to mining in Nova Scotia, as well as with archeological data on the use of shell money by complex societies in pre-Columbian Peru. Hornborg's use of these disparate data sets supports his contention that anthropologists should quit "dissecting local worlds," and instead turn their objectifying gaze on processes of modernity to show how local lives have changed as a result of modernity. Specifically, anthropologists should ask how to "conceptualize the relations between money, language, identity, and power in a way that suggests strategies for reempowering local sustainable communities." The book argues that the answer is framed by development—a process by which forces larger than the community come to have a much greater say about the flow of resources in that community than does the community itself.

Hornborg steers clear of romanticizing local and indigenous people, and says that context is what creates behaviors that are sustainable. Feminism, socialism, environmentalism, and indigenous movements all use rhetoric of good and evil, wherein these movements are on the good side, and their enemies are on the bad side. Many would see this as a Levi-Straussian dictum that humans seek to understand through polar opposites. However, the book argues that it is modernity that is responsible for this kind of thinking, rather than deep structure. Perhaps the special impact of modernity (or is it

industrial capitalism?) is caused by another process noted in the book, that modernity pits groups against one another for the limited resource of charity/donation/human development money (and publicity). In order to shore up the relatively sparse argument that modernity is the cause of extremism in identity building, a discussion of revitalization movements would be an interesting addition to the book. Nonetheless, the Nova Scotia case study chapter does provide an interesting perspective on how globalization and world systems help create local meanings and local behaviors, even if those meanings and behaviors themselves can be considered anti-systemic or anti-globalization.

The book does rely on frustrating jargon at times, such as 'objectifying modernity' or 'encompassing encompassment.' And citations are not provided for heady, or perhaps even circular, statements like "Modernist realities tend to objectify, encompass, and transcend the concrete realities of place" (226). Also, the book's editors could have helped the readability of the book by insisting that quotes be removed from frequent use for several words (e.g., 'order', 'value', 'usable form'). These minor qualms aside, the ideas in the book are quite accessible and will prove a fruitful resource with which people interested in theory or application concerning a host of contemporary problems can dialogue for many years to come.

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