

## GLOBAL ENVIRONMENTAL HISTORY

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### Summary

European landscapes have for centuries been organically connected with landscapes (plantations, clear cuts, mines, etc.) on other continents. The environmental impacts of asymmetric material flows, geared to capital accumulation in core areas, can be addressed with modern concepts of ecologically unequal exchange and environmental load displacement, with which historians are rarely familiar. When scholars with a background in natural sciences turn to human history, on the other hand, there is a disturbing silence on the role of specificities of culture and social structure in accounting for historical processes. Geographical determinism often proves seductive in its simplicity, reflecting a desire for simple, material explanations of world history.

It is imperative to maintain an analytical distinction between the material/biophysical and the cultural/semiotic dimensions of human economies. A crucial task is to acknowledge the biophysical dimension but without equating it with 'value.' Global histories of cultural desire are continuously being written, but so far no systematic global history of the environmental impacts of these desires, and of the production processes organized to cater to them. Although not as geographically extended as in more recent societies, the polarization of centers of accumulation and impoverished extractive zones was evident even in early civilizations. The geographical position of Europe in the sixteenth century gave it access to New World silver, furs, forests, and agricultural land, which over the next five centuries stimulated new and expansive

strategies for capital accumulation through long-distance trade, colonialism, slavery, and industrialization.

Different kinds of environmental load displacement reflect the different kinds of technological infrastructures that are being accumulated. If a world-system perspective is crucial for understanding the local details of environmental history, ecology is no less fundamental for understanding world-system history. To trace the metabolic flows of world-systems requires a basic familiarity with their biophysical aspects such as the use of energy and land, the displacement of entropy, and ecologically unequal exchange. For two centuries, the age of fossil fuels has kept land requirements and energy requirements distinct from each other, but our current vision of a turn to biofuels suggests that we are imagining a future where land requirements and energy requirements will once again coincide.

## 1. Introduction

Although rich in empirical detail, studies in environmental history often strike world-system analysts as theoretically underdeveloped. They generally do not address the fact that landscape changes in core areas have been recursively interconnected with those in peripheral areas. Although several recent books claim to deal with global environmental history (e.g., McNeill 2000; Hughes 2001; Richards 2003; Radkau 2008; Simmons 2008), they are rarely 'global' in this sense. They tend to offer a series of national and local case studies, focusing more on the environmental records of individual nations and groups than on the global historical processes and material flows that have generated their problems as well as their options. In terms of Pomeranz' (2000) useful distinction, most of these global narratives treat different regions in terms of "comparisons" rather than "connections."

The main theoretical conclusion of much of this work is the recurrent observation that technologies designed to solve one kind of problem will ironically tend to generate even more severe problems of another kind, often for other groups of people. This conclusion should instill a powerful antidote against the pervasive belief in technological solutions, but the underlying message is generally that there is something inevitable and politically innocent about the course of global environmental history. Considering that many of these authors use words such as 'global' and 'world' in the titles of their books, it is remarkable that so few of them really consider the world as a *system*, in which environmental transformations in two geographically distant countries or regions may be closely intertwined in terms of causal connections. There is very little recognition of the fact that economic expansion in one area often implies environmental load displacement to other areas.

The first part of this chapter critically reviews some recent treatments of human-environmental relations over the long term by historians, archaeologists, and geographers. The second part offers an analytical framework for understanding global environmental history based on a world-system perspective and on a concept of *accumulation* that acknowledges both the semiotic and the material dimensions of exchange in human societies.

## 2. Contributions from Different Disciplines

The expansive trans-disciplinary project of ‘environmental history’ has united historians, geographers, archaeologists, anthropologists, sociologists, economists, ecologists, agronomists, foresters, and several other academic professions in tracing environmental transformations over time. This section reviews some recent contributions to this field – with vantage-points from disciplines as diverse as economic history, archaeology, and biogeography – in terms of their more or less explicit analytical frameworks. It critically discusses their theoretical assumptions, for instance regarding a recurrent inclination toward Eurocentrism or European exceptionalism.

### 2.1. Environmental History

In *An Environmental History of the World* (2001), Donald Hughes presents a number of case studies of human-environmental interaction arranged chronologically to illustrate eight “general periods in human history...characterized by large-scale changes in the relationship of human societies to the biosphere.” His ambition to use case studies to exemplify “the larger picture” raises the question of what this “larger picture” finally comprises. Although he quotes Aldo Leopold on the imperative of fusing ecology with the findings of “sociology, economics, and history,” Hughes’ attempts to transcend the discipline of history lead only to ecology, never to any significant contributions from sociology or economics. His vision of environmental history is “a world history that adopts ecological process as its organizing principle,” leaving readers from the social sciences wondering if global social organization over the long term can really be reduced to ecology. In his wide-ranging book, Hughes briefly considers the role of long-distance demands on natural resources, as in the distant environmental impacts of cities in Mesopotamia, Rome, and medieval Italy, but these are momentary excursions that do not discuss such environmental load displacements as a recurrent phenomenon in world history. Like most other historians narrating global environmental change, Hughes does not seem to consider societies themselves as globally organized. Instead, the recurrent sources of environmental change are presented in the fragmented terms of factors such as population growth, new technologies, inadequate ideas and ethics, lack of foresight, and greed. As we shall see, the absence of insights regarding the global organization of society, from which such local phenomena can be derived, is currently pervasive in the narration of global environmental history.

In Joachim Radkau’s book *Nature and Power: A Global History of the Environment* (2008; German edition 2002), the emphasis on the Old World, Europe in particular, provides a welcome complement to the widespread preoccupation with the Americas and Oceania that has dominated the first decades of environmental history. The volume illustrates how concerns with sustainable human-environmental relations have been central to European consciousness many centuries before the colonization of the New World. In rich anecdotal detail, Radkau’s narrative shows how local populations and central administrators have dealt with recurrent problems of soil degradation, deforestation, irrigation, and the pollution of water and air. However, there is very little theoretical treatment of the historical data. Radkau’s environmental history is not ‘global’ in the sense that it shows how environmental changes in different parts of the world are interconnected. It focuses on the environmental records of individual nations

and (essentialized) religions and peoples – such as Muslims and Amerindians – rather than on global historical processes. There is also a troubling inclination toward an explicit European exceptionalism, as in assertions that in Central and Western Europe “environmental problems were more or less solved.” Referring to, among others, the biogeographer Jared Diamond (whom he calls an “ethnologist,” but see below), Radkau lists the features that supposedly made Europe uniquely sustainable: the many domesticated animals; the abundance of forest; the robust soils; the regularity of rainfall; the many streams suitable for water mills; the legal and political institutions; etc. Where others (e.g., Pomeranz 2000) have seen European expansionism as a strategy of environmental load displacement, i.e. as a response to socio-ecological crisis, Radkau sees it as a sign of stability and success.

Radkau’s concern with “power” seems almost completely restricted to the sphere of politics and policies, whereas serious critical analysis of the environmental implications of *economic* systems is just as absent as world-system analysis. Although occasionally critical of the “concentration of capital” and the “quest for private profit,” he suggests that environmental protection is “dependent on cooperation with economic forces” and that to draw adversarial “battle lines” between ecology and economy is “absurd.” He does note, however, that the new petroleum energy regime associated with the post-war “1950s syndrome” represents a decisive discontinuity in human-environmental relations.

For Radkau, as for many other historians, environmental history seems primarily to be the history of environmentalism. His ambition to offer general statements on a phenomenon as heterogeneous as human views on their environment can only lead to inconsistencies and contradictions, as in his discussions of local and individual agency vs. large-scale, central coordination, and in his ambiguous account of the German love for a nationalized *Heimat* or the “exemplary” environmental record of the dictatorial “ecotopia” of Bhutan. Although frequently an advocate of local community wisdom and tacit practical knowledge, he has an unmistakable faith in the authority of the nation state. Similarly ambivalent are his assessments of national vs. global environmental policy. His apparent determination to accommodate and legitimize perspectives ranging from sober rationality and pragmatism to romanticism and mysticism finally leaves the reader asking for a bottom line. No wonder that a German radio journalist, to the author’s consternation, presented *Natur und Macht* as a dismissal of environmental worries. There are a number of normative assertions, to be sure, but hardly any theoretical conclusions, except perhaps, the recurrent observation that solutions tend to create new problems.

This seems precisely also to be the central conclusion of J.R. McNeill’s celebrated volume *Something New under the Sun* (2000), focusing on the environmental history of the twentieth century. McNeill has organized his chapters in terms of the biophysical character of the environmental problems that he considers, e.g., whether relating to soil, air, water, biodiversity, demography, or energy use. This makes his book more useful and easier to read than Radkau’s, and it offers an impressive range of historical and quantitative data on global environmental change over the past century. Like Radkau, however, McNeill seems to have little ambition to offer a theoretical understanding of the societal drivers of landscape change. His account reflects extensive reading, but the

analytical interpretations are based on common sense and generally do not transcend images of environmental history that most educated citizens already subscribe to. Yes, there has been an abundance of cheap energy (for some), economic growth (for some), population growth, urbanization, industrialization, air and water pollution, soil erosion, deforestation, and biodiversity loss. In addressing the driving forces behind these well-known changes, McNeill refers very briefly to “human ingenuity” and “luck,” or to “the attractions of higher living standards, or at least more consumption, for masses of people; of profit for hundreds of firms engaged in mining, metallurgy, electric power generation, and other polluting enterprises; and of political power for states, bureaucracies, and politicians.”

The main theoretical insight that can be extracted from McNeill’s volume is thus very similar to what we might conclude from reading Radkau, viz. that technologies designed to solve one kind of problem will, ironically, tend to generate other and even more severe problems of another kind. This has, for instance, repeatedly proven true of energy use, new transport technologies, the industrialization of agriculture and fishing, refrigeration, irrigation, the introduction of new species, and mass production for mass consumption. The impression conveyed by these texts is that there is something inevitable about environmental degradation, at least in terms of the drivers of environmental problems, if not in terms of how politicians tend to deal with them. Neither Radkau nor McNeill in their grand syntheses discusses the fact that environmental transformations in two geographically distant regions may be closely interconnected, or that some regions and populations may become the impoverished and disempowered victims of accumulative strategies originating elsewhere (but cf. McNeill’s afterword in McAnany & Yoffee 2010 for such a pertinent perspective on the ‘success’ of the contemporary Netherlands).

By contrast, in *The Great Divergence* (2000), Kenneth Pomeranz shows exactly this. He argues that the unique economic and technological developments in eighteenth- and nineteenth-century Europe should not be explained with reference to some features specific to Europe, but to its special combination of fossil fuels and access to New World resources. He shows that the conditions in early eighteenth-century Europe did not differ very much from those of China at that time, either in terms of demography, ecology, technology, or wealth. Although he shares the general world-system approach of Fernand Braudel and Immanuel Wallerstein, Pomeranz joins James Blaut (2000) and André Gunder Frank (1998) in rejecting their argument that the emergence of specific institutions in early modern Europe (including a ‘capitalist mode of production’) made the region more conducive to economic development than, for instance, China or Japan. By and large, circumstances that specifically favored Europe were not internal to Europe, he argues, but the result of external global conjunctures, such as its access to silver and plantations in the New World and slaves from Africa, and the Asian demand for silver. These circumstances made it possible for an “otherwise largely unexceptional” Europe to transcend the land constraints that it shared with East Asia by using labor and capital to “exchange an ever-growing volume of manufactured exports for an ever-growing volume of land-intensive products,” mainly from the Americas. In a chapter titled “Abolishing the Land Constraint,” Pomeranz calculates the “ecological relief” (also known as ‘environmental load displacement’) gained by Britain in 1830 through imports of cotton, sugar, and timber from overseas at between 25 and 30

million “ghost acres,” i.e. much more than the nation’s total arable land (17 million acres). Already in the 1780’s, Britain indirectly saved about 650 000 acres per year by using New World silver to pay for its Baltic timber imports. The list of similar calculations could be extended considerably (cf. Hornborg, McNeill & Martinez-Alier 2007). Suffice it to say that they add up to the conclusion that European landscapes – whether devoted to crops, pastures, forestry, mining, or urban-industrial infrastructure – for centuries have been organically connected with landscapes (plantations, clear cuts, mines, etc.) on other continents. The global environmental impacts of these interconnected and asymmetric material flows, geared to capital accumulation in core areas, are today being assessed in terms of ‘ecological footprints.’

To the extent that specifically European institutions contributed to this development, Pomeranz observes, they had little to do with free markets, but rather the opposite: e.g., state-licensed monopolies, armed trade and colonization, and the projection of interstate rivalries overseas. Pomeranz clarifies his approach to world history by distinguishing between global narratives treating different regions in terms of “comparisons” and “connections.” Using this distinction, we may conclude that mainstream environmental history is primarily interested in comparison, whereas Pomeranz – following the Braudelian tradition – elaborates the “reciprocal influences” and interactions between different regions.

In *The Unending Frontier* (2003), John Richards also highlights the early modern connections between an expanding Europe and other continents. In fourteen detailed case studies of distinct types of anthropogenic environmental change in different parts of the world, he shows how a combination of population growth and the integration of the world economy in the sixteenth to eighteenth centuries generated recurrent problems in the form of intensified land use, biological invasions, depletion of wildlife, and energy scarcity. In the Introduction, Richards aspires to “a holistic global perspective,” but modestly concedes that the selection of case studies “may seem arbitrary, almost random” and that they are “difficult to fit into a meaningful interpretation of environmental history and world history.” After posing questions such as, “What is the global pattern?” and “What shared historical processes do these case studies demonstrate?,” his answer is simply to enumerate the four main kinds of environmental change mentioned above. Although he concludes that the consequences of European expansion for pre-modern ecosystems and societies were generally “tragic,” Richards finally seems compelled to condone the inevitable progress of “brutality,” “waste,” and “degradation” toward a more “productive,” “attractive,” and “aesthetically appealing” landscape in the newly conquered territories. Of more specific interest in his account is the decisive role he attributes to the agency of modern states in these historical processes. To once again apply Pomeranz’ distinction, Richards’ world history seems more concerned with global comparisons than with global connections. His position is ambiguous, however. His monumental book certainly traces the early modern emergence of a “world system” (a concept he actually refers to), but it does not explicitly address the fact that landscape changes within Europe in this period were recursively connected with environmental changes in other parts of the world.

The same might be said of Clive Ponting’s popular but pioneering book *A Green History of the World* (1991). Beginning with some classic “lessons from Easter Island”

(cf. also Diamond 2005), Ponting chronologically traces a cursory but global environmental history from Paleolithic foraging through Neolithic agriculture and pastoralism, population growth, European expansion, colonialism, the Industrial Revolution, urbanization, and mass consumption to global warming. Although Pomeranz' and Richards' volumes are much better documented and their arguments more sophisticated, it is striking how their narratives of energy use, European expansion, and "the world hunt" (Richards 2003) echo Ponting's account a decade earlier. But Ponting's objective goes beyond the meticulous reconstruction of human history by conveying an explicit warning about recurrent Malthusian limits and the threat of socio-ecological collapse. Like Radkau, McNeill, Richards, and most other environmental historians, however, he does not address the analytical task of accounting for the reciprocal connections between landscape changes on different continents within a single theoretical framework – for example, the total causal web that over time connected deforestation in northern Europe, silver mining in Latin America, sugar plantations in the Caribbean, cotton plantations in southeastern North America, and coal mining in Britain. Although brief, only Worster's (1988) early visions of global environmental history seem to anticipate the focus on *connections* that organizes Pomeranz' world-system approach.

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### **Biographical sketch**

**Alf Hornborg** is an anthropologist and since 1993 Professor of Human Ecology at Lund University, Sweden. He is the author of *The Power of the Machine: Global Inequalities of Economy, Technology, and Environment* (2001) and lead editor of several volumes including *Rethinking Environmental History* (2007), *The World System and the Earth System* (2007), *International Trade and Environmental Justice* (2010), and *Ethnicity in Ancient Amazonia* (2011).