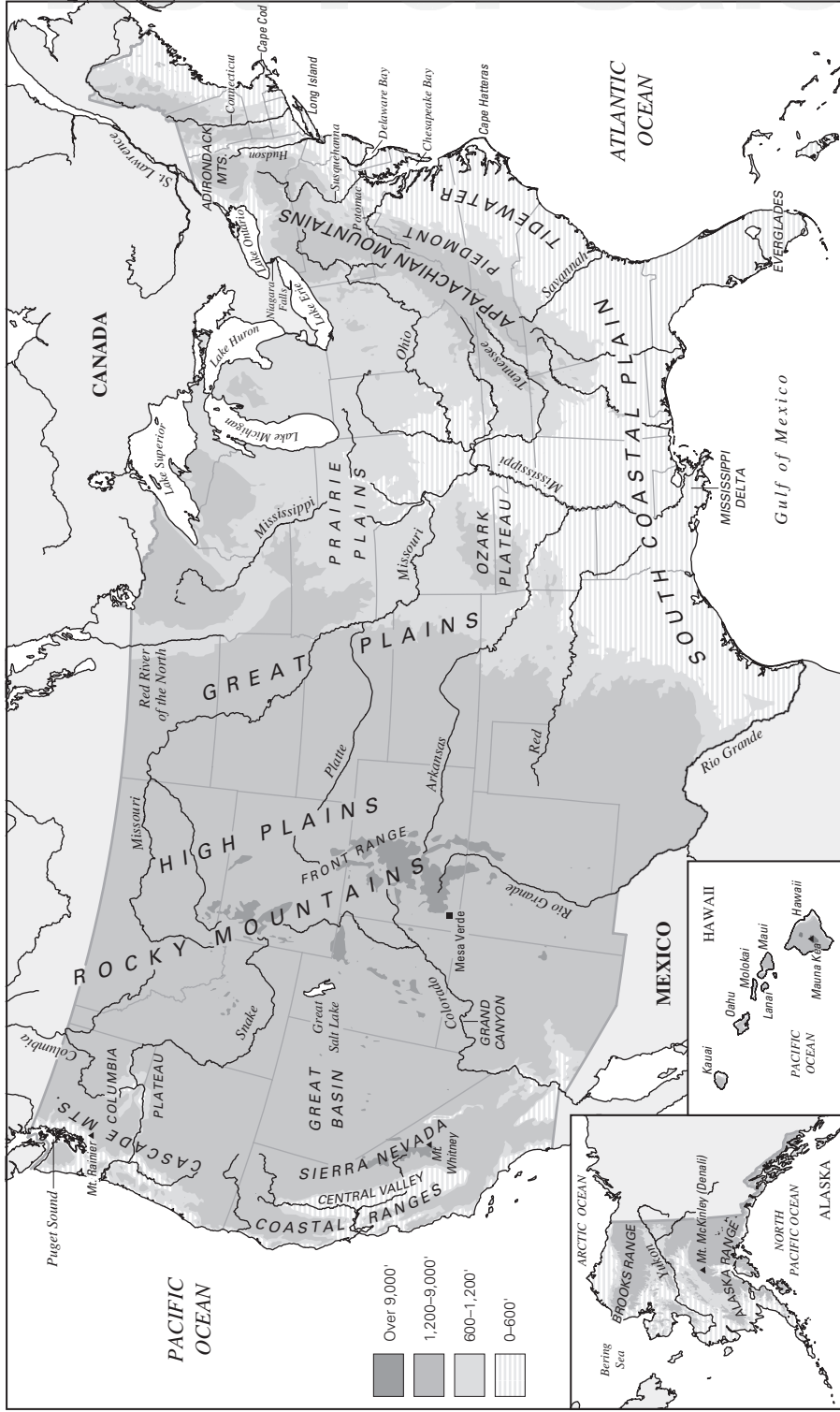


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MAP 1.1 Physiographic Map of the United States

## CHAPTER 1

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# What Is Environmental History?

*Environmental history offers an earth's-eye view of the past. It addresses the many ways in which human beings have interacted with the natural environment over time. As one of the newest perspectives within the discipline of history, it is a field that is still in the process of self-definition. It therefore offers the exciting challenge of engaging in a dialogue with the documents of the past and with historians of the present to create individual interpretations of history.*

*For environmental historians, the term environment refers to the natural and human-created surroundings that affect a living organism or group of organisms' ability to maintain itself and develop over time. Ecology deals with the relationships between these organisms and their surroundings. In the case of humans, it also includes social and cultural patterns. Ecological history is therefore somewhat broader than environmental history, but the two terms are often used interchangeably.*

*Environmental history's pictures of the past come from a colorful palette of sources. From the natural history side of the picture come data on climatic fluctuations; geological changes; plant and animal ecology; and microbial life. From human history come tools for extracting resources; account books of traders; journals of explorers; court records of births and deaths; laws; diaries of farmers; interviews with slaves; Indian myths and legends; paintings, poetry, and essays about nature; scientific investigations; and the musings of philosophers.*

*Environmental historians ask a number of questions of these sources. How and why did people living in a particular place at a particular time use and transform their environment? How did people of different cultural backgrounds and of both genders perceive, manage, exploit, and conserve their environments? What differing economic forms, or modes of production (such as gathering, hunting, fishing, farming, ranching, mining, and forestry), evolved in particular habitats? What problems of pollution and depletion arose under industrialization and urbanization? What political and legal conflicts, struggles, and compromises emerged over resource use and conservation? How did people's attitudes toward nature and their mental constructions of nature change over time? And how do changing*

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*concepts of ecology influence the interpretations of environmental historians? In attempting to answer these kinds of questions, environmental historians have developed a number of different conceptual approaches, five of which are considered in this chapter.*



## ESSAYS

The five essays in this chapter offer contrasting frameworks for interpreting environmental history. In the first essay, Donald Worster, Hall Distinguished Professor of American History at the University of Kansas, discusses three of the environmental historian's most important sources: ecology, modes of production, and ideas, using these three levels of interpretation as the framework for doing environmental history. The second essay is by Jared Diamond of the Geography Department at the University of California, Los Angeles. Diamond argues that Europeans were able to take over the New World because the Eurasian environment had many more species of domesticatable animals than did the Americas, leading to settled agriculture and complex political organizations supported by metal technologies. Europeans thus had an ecological advantage in colonizing the globe. The third essay is by William Cronon, Villas Professor of History at the University of Wisconsin, Madison. Cronon suggests that environmental historians may tell stories about environmental degradation as parables to raise people's consciousness about healing and restoring nature to an earlier ideal. But that romanticized ideal never really exists. Nature is never static or stable, and the awesome human power to change nature means that transformed biotic actors may in turn have immense consequences for humanity. The fourth essay, by Carolyn Merchant, professor of environmental history at the University of California at Berkeley, looks at the importance of gender, race, and class in interpreting environmental history and argues that we also need to consider the category of reproduction when *doing* environmental history. In the fifth essay, J. Donald Hughes, emeritus professor of the University of Denver places environmental history in the context of global history, arguing that not only have introductions of new species and resources transformed global ecosystems, but increasingly pollution of the oceans and air affect global climate and the health of the planet as a whole. Together the essays introduce important concepts about nature and society that provide a toolkit for doing and interpreting environmental history.

### Doing Environmental History

DONALD WORSTER

In the old days, the discipline of history had an altogether easier task. Everyone knew that the only important subject was politics and the only important terrain

From Donald Worster, "Doing Environmental History," in Donald Worster, ed., *The Ends of the Earth: Perspectives on Modern Environmental History* (New York: Cambridge University Press, 1988), pp. 289–299, 301–303, 305–306. Reprinted with the permission of Cambridge University Press.

was the nation-state. One was supposed to investigate the connivings of presidents and prime ministers, the passing of laws, the struggles between courts and legislatures, and the negotiations of diplomats. That old, self-assured history was actually not so old after all—a mere century or two at most. It emerged with the power and influence of the nation-state, reaching a peak of acceptance in the nineteenth and early twentieth centuries. Often its practitioners were men of intensely nationalistic feelings, who were patriotically moved to trace the rise of their individual countries, the formation of political leadership in them, and their rivalries with other states for wealth and power. They knew what mattered, or thought they did.

But some time back that history as “past politics” began to lose ground, as the world evolved toward a more global point of view and, some would say, toward a more democratic one. Historians lost some of their confidence that the past had been so thoroughly controlled or summed up by a few great men acting in positions of national power. Scholars began uncovering long submerged layers, the lives and thoughts of ordinary people, and tried to reconceive history “from the bottom up.” Down, down we must go, they maintained, down to the hidden layers of class, gender, race, and caste. There we will find what truly has shaped the surface layers of politics. Now enter still another group of reformers, the environmental historians, who insist that we have got to go still deeper yet, down to the earth itself as an agent and presence in history. Here we will discover even more fundamental forces at work over time. And to appreciate those forces we must now and then get out of parliamentary chambers, out of birthing rooms and factories, get out of doors altogether, and ramble into fields, woods, and the open air. It is time we bought a good set of walking shoes, and we cannot avoid getting some mud on them....

Environmental history is, in sum, part of a revisionist effort to make the discipline far more inclusive in its narratives than it has traditionally been. Above all, it rejects the conventional assumption that human experience has been exempt from natural constraints, that people are a separate and “supernatural” species, that the ecological consequences of their past deeds can be ignored. The old history could hardly deny that we have been living for a long while on this planet, but it assumed by its general disregard of that fact that we have not been and are not truly part of the planet. Environmental historians, on the other hand, realize that we can no longer afford to be so naive.

The idea of environmental history first appeared in the 1970s, as conferences on the global predicament were taking place and popular environmentalist movements were gathering momentum in several countries. It was launched, in other words, in a time of worldwide cultural reassessment and reform. History was hardly alone in being touched by that rising mood of public concern; scholarship in law, philosophy, economics, sociology, and other areas was similarly responsive. Long after popular interest in environmental issues crested and ebbed, as the issues themselves came to appear more and more complicated, without easy resolution, the scholarly interest continued to expand and take on greater and greater sophistication. Environmental history was, therefore, born out of a moral purpose, with strong political commitments behind it, but also

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became, as it matured, a scholarly enterprise that had neither any simple, nor any single, moral or political agenda to promote. Its principal goal became one of deepening our understanding of how humans have been affected by their natural environment through time and, conversely, how they have affected that environment and with what results....

Much of the material for environmental history has ... been around for generations, if not for centuries, and is only being reorganized in the light of recent experience. It includes data on tides and winds, on ocean currents, on the position of continents in relation to each other, on the geological and hydrological forces creating our land and water base. It includes the history of climate and weather, as these have made for good or bad harvests, sent prices up or down, ended or promoted epidemics, led to population increase or decline. All these have been powerful influences over the course of history, and continue to be so, as when massive earthquakes destroy cities or starvation follows in the wake of drought or rivers determine the flow of settlement. The fact that such influences continue in the late twentieth century is evidence of how far we are yet from controlling the environment to our complete satisfaction....

Put in the vernacular then, environmental history is about the role and place of nature in human life. By common understanding we mean by "nature" the nonhuman world, the world we have not in any primary sense created.... The built environment is wholly expressive of culture; its study is already well advanced in the history of architecture, technology, and the city. But with such phenomena as the forest and the water cycle, we encounter autonomous energies that do not derive from us. Those forces impinge on human life, stimulating some reaction, some defense, some ambition. Thus, when we step beyond the self-reflecting world of humankind to encounter the nonhuman sphere, environmental history finds its main theme of study.

There are three levels on which the new history proceeds, three clusters of issues it addresses, though not necessarily all in the same project, three sets of questions it seeks to answer, each drawing on a range of outside disciplines and employing special methods of analysis. The first deals with understanding nature itself, as organized and functioning in past times; we include both organic and inorganic aspects of nature, and not least the human organism as it has been a link in nature's food chains, now functioning as womb, now belly, now eater, now eaten, now a host for microorganisms, now a kind of parasite. The second level in this history brings in the socioeconomic realm as it interacts with the environment. Here we are concerned with tools and work, with the social relations that grow out of that work, with the various modes people have devised of producing goods from natural resources. A community organized to catch fish at sea may have very different institutions, gender roles, or seasonal rhythms than one raising sheep in high mountain pastures. Power to make decisions, environmental or other, is seldom distributed through a society with perfect equality, so locating the configurations of power is part of this level of analysis. Then, forming a third level for the historian is that more intangible and uniquely human type of encounter—the purely mental or intellectual, in which perceptions, ethics, laws, myths, and other structures of meaning become part of an

individual's or group's dialogue with nature. People are constantly engaged in constructing maps of the world around them, in defining what a resource is, in determining which sorts of behavior may be environmentally degrading and ought to be prohibited, and generally in choosing the ends of their lives. Though for the purposes of clarification, we may try to distinguish between these three levels of environmental study, in fact they constitute a single dynamic inquiry in which nature, social and economic organization, thought and desire are treated as one whole. And this whole changes as nature changes, as people change, forming a dialectic that runs through all of the past down to the present.

This in general is the program of the new environmental history. It brings together a wide array of subjects, familiar and unfamiliar, rather than setting up some new, esoteric specialty. From that synthesis, we hope, new questions and answers will come.

### **Natural Environments of the Past**

The environmental historian must learn to speak some new languages as well as ask some new questions. Undoubtedly, the most outlandish language that must be learned is the natural scientist's. So full of numbers, laws, terms, and experiments, it is as foreign to the historian as Chinese was to Marco Polo. Yet, with even a smattering of vocabulary, what treasures are here to be understood and taken back home! Concepts from geology, pushing our notions of history back into the Pleistocene, the Silurian, the Precambrian. Graphs from climatology, on which temperatures and precipitation oscillate up and down through the centuries, with no regard for the security of kings or empires. The chemistry of the soil with its cycles of carbon and nitrogen, its pH balances wavering with the presences of salts and acids, setting the terms of agriculture. Any one of these might add a powerful tool to the study of the rise of civilizations. Together, the natural sciences are indispensable aids for the environmental historian, who must begin by reconstructing past landscapes, learning what they were and how they functioned before human societies entered and rearranged them.

But above all it is ecology, which examines the interactions among organisms and between them and their physical environments, that offers the environmental historian the greatest help. This is so in part because, ever since Charles Darwin, ecology has been concerned with past as well as present interactions; it has been integral to the study of evolution. Equally significant, ecology is at heart concerned with the origins, dispersal, and organization of all plant life. Plants form by far the major portion of the earth's biomass. All through history people have depended critically on them for food, medicine, building materials, hunting habitat, and a buffer against the rest of nature. Far more often than not, plants have been humans' allies in the struggle to survive and thrive. Therefore, where people and vegetation come together more issues in environmental history cluster than anywhere else. Take away plant ecology and environmental history loses its foundation, its coherence, its first step.

So impressed are they with this fact that some scholars speak of doing, not environmental, but "ecological history" or "historical ecology." They mean to

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insist on a tighter alliance with the science. Some years back the scientist and conservationist Aldo Leopold projected such an alliance when he spoke of “an ecological interpretation of history.” His own illustration of how that might work had to do with the competition among native Indians, French and English traders, and American settlers for the land of Kentucky, pivotal in the westward movement. The canebrakes growing along Kentucky bottomlands were a formidable barrier to any agricultural settlement, but as luck would have it for the Americans, when the cane was burned and grazed and chopped out, bluegrass sprouted in its place. And bluegrass was all that any farmer, looking for a homestead and a pasture for his livestock, could want. American farmers entered Kentucky by the thousands, and the struggle was soon over. “What if,” Leopold wondered, “the plant succession inherent in this dark and bloody ground had, under the impact of forces, given us some worthless sedge, shrub, or weed?” Would Kentucky have become American property as and when it did?...

When organisms of many species come together, they form communities, usually highly diverse in makeup, or as they are more commonly called now, ecosystems. An ecosystem is the largest generalization made in the science, encompassing both the organic and inorganic elements of nature bound together in a single place, all in active, reciprocating relationship. Some ecosystems are fairly small and readily demarcated, like a pond in New England, while others are sprawling and ill-defined, as large as the Amazonian rain forest or the Serengeti plain or even the whole earth.... The ecologist is interested in how such systems go on functioning in the midst of continual perturbations, and how and why they break down.

But right there occurs a difficult issue on which the science of ecology has reached no clear consensus. How stable are those natural systems and how susceptible to upset? Is it accurate to describe them as balanced and stable until humans arrive? And if so, then at what point does a change in their equilibrium become excessive, damaging or destroying them? Damage to the individual organism is easy enough to define: It is an impairment of health or, ultimately, it is death. Likewise, damage to a population is not very hard to determine, simply, when its numbers decline. But damage to whole ecosystems is a more controversial matter. No one would dispute that the death of all its trees, birds, and insects would mean the death of a rain-forest ecosystem, or that the draining of a pond would spell the end of that system. But most changes are less catastrophic, and the degree of damage has no easy method of measurement....

Human beings participate in ecosystems either as biological organisms akin to other organisms or as culture bearers, though the distinction between the two roles is seldom clear-cut. Suffice it here to say that, as organisms, people have never been able to live in splendid, invulnerable isolation. They breed, of course, like other species, and their offspring must survive or perish by the quality of food, air, and water and by the number of microorganisms that are constantly invading their bodies. In these ways and more, humans have inextricably been part of the earth's ecological order. Therefore, any reconstruction of past environments must include not only forests and deserts, boas and rattlesnakes, but also the human animal and its success or failure in reproducing itself.

## Human Modes of Production

Nothing distinguishes people from other creatures more sharply than the fact that it is people who create culture. Precisely what culture really is, however, is anybody's guess. There are literally scores of definitions. For preliminary purposes it can be said that the definitions tend to divide between those including both mental and material activities and those emphasizing mental activities exclusively, and that these distinctions between the mental and material correspond to the second and third levels of analysis in our environmental history. In this section we are concerned with the material culture of a society, its implications for social organization, and its interplay with the natural environment.

In any particular place nature offers the humans dwelling there a flexible but limited set of possibilities for getting a living. The Eskimos of the northern polar regions, to take an extreme case of limits, cannot expect to become farmers. Instead, they have ingeniously derived a sustenance, not by marshaling seed, plows, and draft animals of other, warmer latitudes, but through hunting. Their food choices have focused on stalking caribou over the tundra and pursuing bowhead whales among floating cakes of ice, on gathering blueberries in season and gaffing fish. Narrow though those possibilities are, they are the gift of technology as much as nature. Technology is the application of skills and knowledge to exploiting the environment. Among the Eskimos technology has traditionally amounted to fish hooks, harpoons, sled runners, and the like. Though constrained by nature, that technology has nonetheless opened up for them a nutritional field otherwise out of reach, as when a sealskin boat allowed them to venture farther out to sea in pursuit of prey....

[Human] modes of production are an endless parade of strategies, as complex in their taxonomies as the myriad species of insects thriving in the canopy of a rain forest or the brightly colored fish in a coral reef. In broad terms, we may speak of such modes as hunting and gathering, agriculture, and modern industrial capitalism.... [T]he environmental historian wants to know what role nature had in shaping the productive methods and, conversely, what impact those methods had on nature.

This is the age-old dialogue between ecology and economy. Though deriving from the same etymological roots, the two words have come to denote two separate spheres, and for good reason: Not all economic modes are ecologically sustainable. Some last for centuries, even millennia, while others appear only briefly and then fade away, failures in adaptation. And ultimately, over the long stretch of time, no modes have ever been perfectly adapted to their environment, or there would be little history.

## Perception, Ideology, and Value

Humans are animals with ideas as well as tools, and one of the largest, most consequential of those ideas bears the name "nature." More accurately, "nature" is not one idea but many ideas, meanings, thoughts, feelings, all piled on top of one another, often in the most unsystematic fashion. Every individual and every culture has created such agglomerations. We may think we know what we are saying



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when we use the word, but frequently we mean several things at once and listeners may have to work at getting our meaning. We may suppose too that nature refers to something radically separate from ourselves, that it is “out there” someplace, sitting solidly, concretely, unambiguously. In a sense, that is so. Nature is an order and a process that we did not create, and in our absence it will continue to exist; only the most strident solipsist would argue to the contrary. All the same, nature is a creation of our minds too, and no matter how hard we may try to see what it is objectively, in and by and for itself, we are to a considerable extent trapped in the prison of our own consciousness and web of meanings.

Environmental historians have done some of their best work on this level of cultural analysis, studying the perceptions and values people have held about the nonhuman world. They have, that is, put people thinking about nature under scrutiny. So impressed have they been by the enduring, pervasive power of ideas that sometimes they have blamed present environmental abuse on attitudes that go far back into the recesses of time: as far back as the book of Genesis and the ancient Hebraic ethos of asserting dominion over the earth; or the Greco-Roman determination to master the environment through reason; or the still more archaic drive among patriarchal males to lord it over nature (the “feminine” principle) as well as women.... So, for good reason, environmental history must include in its program the study of aspects of esthetics and ethics, myth and folklore, literature and landscape gardening, science and religion—must go wherever the human mind has grappled with the meaning of nature.

For the historian, the main object must be to discover how a whole culture, rather than exceptional individuals in it, perceived and valued nature. Even the most materially primitive society may have had quite sophisticated, complex views. Complexity, of course, may come from unresolved ambiguities and contradictions as well as from profundity. People in industrial countries especially seem to abound in these contradictions: They may chew up the land wholesale and at a frightful speed through real estate development, mining, and deforestation but then turn around and pass laws to protect a handful of fish swimming in a desert spring. Some of this is simply confusion, some of it may be quite reasonable.... Every culture, we should assume, has within it a range of perceptions and values, and no culture has ever really wanted to live in total harmony with its surroundings.

But ideas should not be left floating in some empyrean realm, free from the dust and sweat of the material world. They should be studied in their relations with those modes of subsistence discussed in the preceding section. Without reducing all thought and value to some material base, as though the human imagination was a mere rationalization of the belly’s needs, the historian must understand that mental culture does not spring up all on its own. One way to put this relationship is to say that ideas are socially constructed and, therefore, reflect the organization of those societies, their techno-environments and hierarchies of power. Ideas differ from person to person within societies according to gender, class, race, and region....

As it tries to redefine the search into the human past, environmental history has, as indicated above, been drawing on a number of other disciplines, ranging

from the natural sciences to anthropology to theology. It has resisted any attempt to put strict disciplinary fences around its work, which would force it to devise all its own methods of analysis, or to require all these overlapping disciplines to stay within their own discrete spheres. Each may have its tradition, to be sure, its unique way of approaching questions. But if this is an age of global interdependence, it is surely also the moment for some cross-disciplinary cooperation. Scholars need it, environmental history needs it, and so does the earth.

## Predicting Environmental History

JARED DIAMOND

This [essay] sets itself the modest task of explaining the broad pattern of history on all the continents for the last 13,000 years. Why did history take such different courses for peoples of different continents?

Eurasians, especially peoples of Europe and eastern Asia, have spread around the globe. They and their overseas descendants now dominate the modern world in wealth and power. Other peoples, including most Africans, survived and have thrown off European domination but remain far behind in wealth and power. Still other peoples, including the original inhabitants of Australia, the Americas and southern Africa, are no longer masters of their own lands but have been decimated, subjugated and even exterminated by European colonialists. Why did history turn out that way, instead of the opposite way? Why were American Indians, Africans and Aboriginal Australians not the ones who conquered or exterminated Europeans and Asians?

This question can easily be pushed back one step further. By the year 1500 [C.E.], the approximate year when Europe's overseas expansion was just beginning, peoples of the different continents already differed greatly in technology and political organization. Much of Eurasia and North Africa was occupied by Iron Age states and empires, some of them on the verge of industrialization. Two Native American peoples, the Incas and Aztecs, ruled over Stone Age or nearly Bronze Age empires. Parts of sub-Saharan Africa were divided among small indigenous Iron Age states or chiefdoms. All peoples of Australia, New Guinea and the Pacific Islands, and many peoples of the Americas and sub-Saharan Africa, lived as Stone Age farmers or hunter-gatherers.

Obviously, those differences as of 1500 [C.E.] were the immediate cause of the modern world's inequalities. Iron Age empires conquered or exterminated Stone Age tribes. But how did the world get to be the way that it was in the year 1500 [C.E.]?

This question, too, can be pushed back a further step, with the help of written histories and archaeological discoveries. Until the end of the last Ice Age around 11,000 B.C.[E.], all humans on all continents were still living as Stone Age

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From Jared Diamond, "The Evolution of Guns and Germs," in A. C. Fabian, ed., *Evolution: Society, Science, and the Universe* (Cambridge: Cambridge University Press, 1998), pp. 46–47, 49–55, 61–62. Reprinted with the permission of Cambridge University Press.

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hunter-gatherers. Different rates of development on different continents, from 11,000 B.C.[E.] to 1500 [C.E.], were what produced the inequalities of 1500 [C.E.]. While Aboriginal Australians and Native American peoples remained Stone Age hunter-gatherers, most Eurasian peoples and many peoples of the Americas and sub-Saharan Africa gradually developed agriculture, herding, metallurgy and complex political organization. Parts of Eurasia, and one area of the Americas, developed indigenous writing as well. But each of these new developments appeared earlier in Eurasia than elsewhere. For instance, mass production of copper tools was only beginning to spread in the South American Andes in the centuries before 1500 [C.E.], but was already spreading in parts of Eurasia 5,000 years before that. The stone technology of Native Tasmanians in 1500 [C.E.] was simpler than that of Upper Palaeolithic Europe tens of thousands of years earlier.

Hence we can finally rephrase our question about the origin of the modern world's inequalities as follows. Why did human development proceed at such different rates on different continents for the last 13,000 years? Those differing rates constitute the broadest pattern of history....

... I shall show that the answer to the question about history's broadest pattern has nothing to do with differences among peoples themselves, but instead lies in differences among the biological and geographical environments in which different peoples found themselves.

## Europe and the New World: Proximate Factors

... Most of us are familiar with the stories of how a few hundred Spaniards under Hernan Cortes overthrew the Aztec Empire, and how another few hundred Spaniards under Francisco Pizarro overthrew the Inca Empire. The populations of each of those empires numbered millions, possibly tens of millions. At the Inca city of Cajamarca in modern Peru, when Pizarro captured the Inca Emperor Atahualpa in 1532, Pizarro's Spaniards consisted of only 62 soldiers on horseback plus 106 foot soldiers, while Atahualpa was leading an Inca army of about 40,000 soldiers.

Most of us are also familiar with the frequently gruesome details of how other Europeans conquered other parts of the New World. The result is that Europeans came to settle and dominate most of the New World, while the Native American population declined drastically from its level as of 1492 [C.E.]. Why did it happen that way? Why did it not happen that Montezuma or Atahualpa led the Aztecs or Incas to conquer Europe?

The *proximate* reasons are obvious. Invading Europeans had steel swords and guns, while Native Americans had only stone and wooden weapons. Just as elsewhere in the world, horses gave the invading Spaniards another big advantage in their conquests of the Incas and Aztecs. Horses had been playing a decisive role in military history ever since they were domesticated at around 4000 B.C.[E.] in the Ukraine. Horses revolutionized warfare in the eastern Mediterranean after 2000 B.C.[E.], later let the Huns and Mongols terrorize Europe and provided the military basis for the kingdoms emerging in West Africa around 1000 [C.E.]. From prehistoric times until the First World War, the speed of attack and retreat

that a horse permitted, the shock of its charge and the raised fighting platform that it provided left foot soldiers nearly helpless in the open. Steel swords, guns and horses were the military advantages that repeatedly enabled troops of a few dozen mounted Spaniards to defeat South American Indian armies numbering in the thousands.

Nevertheless, guns, steel swords and horses were not the sole proximate factors in the European conquest of the New World. The Indians killed in battle by guns and swords were far outnumbered by those killed at home by infectious diseases such as smallpox and measles. Those diseases were endemic in Europe, and Europeans had had time to develop both genetic and immune resistance to them, but Indians initially had no such resistance. Diseases that were introduced with the Europeans spread from one Indian tribe to another, far in advance of the Europeans themselves, and killed an estimated 95% of the New World's Indian population....

Finally, there is still another set of proximate factors to be considered. How is it that Pizarro and Cortes reached the New World at all, before Aztec and Inca conquistadores could reach Europe? That depended in the first instance on ships reliably capable of crossing oceans. Europeans had such ships, while the Aztecs and Incas did not. Those ships were backed by the political organization that enabled Spain and other European countries to finance, build, staff and equip the ships. Equally crucial was the role of writing in permitting the quick spread of accurate detailed information, including maps, sailing directions and accounts by earlier voyagers to motivate later explorers. Writing may also be relevant to what seems to us today the incredible naïveté that permitted Atahualpa to walk into Pizarro's trap and permitted Montezuma to mistake Cortes for a returning god. Since the Incas had no writing and the Aztecs had only a short tradition of writing, they did not inherit knowledge of thousands of years of written history. That may have left them less able to anticipate a wide range of human behavior and dirty tricks, and made Pizarro and Cortes better able to do so.

### **Europe and the New World: Ultimate Factors**

So far, we have identified a series of proximate factors behind European colonization of the New World: ships, political organization and writing that brought Europeans to the New World; European germs that killed most Indians before they could reach the battle field; and guns, steel swords and horses that gave Europeans a big advantage on the battle field. Now, let us try to push the chain of causation back further. Why did these proximate advantages go to the Old World rather than to the New World? Theoretically, American Indians might have been the ones to develop steel swords and guns first, to develop ocean-going ships and empires and writing first, to be mounted on domestic animals more terrifying than horses and to bear germs worse than smallpox.

The part of that question that is easiest to answer concerns the reasons why Eurasia evolved the nastiest germs. It is striking that American Indians evolved no devastating epidemic diseases to give to Europeans, in return for the many devastating epidemic diseases that they received from the Old World.

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There are two straightforward reasons for this gross imbalance. First, most of our familiar epidemic diseases can sustain themselves only in large dense human populations concentrated into villages and cities, which arose much earlier in the Old World than in the New World. Second, most human epidemic diseases evolved from similar epidemic diseases of the domestic animals with which we came into close contact. For example, measles arose from a disease of our cattle, influenza from a disease of pigs, smallpox from a disease of cows and falciparum malaria from a disease of birds such as chickens. The Americas had a very few native domesticated animal species from which humans could acquire diseases: just the llama/alpaca (varieties of the same ancestral species) and guinea pig in the Andes, the Muscovy duck in tropical South America, the turkey in Mexico and the dog throughout the Americas. In contrast, think of all the domesticated animal species native to Eurasia: the horse, cow, sheep, goat, pig and dog throughout Eurasia; many local domesticates, such as water buffalo and reindeer; many domesticated small mammals, such as cats and rabbits; and many domesticated birds, including chickens, geese and mallard ducks.

Let us now push the chain of reasoning back one step further. Why were there far more species of domesticated animals in Eurasia than in the Americas? Since the Americas harbour over a thousand native wild mammal species and several thousand wild bird species, you might initially suppose that the Americas offered plenty of starting material for domestication.

In fact, only a tiny fraction of wild mammal and bird species has been successfully domesticated, because domestication requires that a wild animal fulfil many prerequisites: a diet that humans can supply, a sufficiently rapid growth rate, willingness to breed in captivity, tractable disposition, a social structure involving submissive behaviour towards dominant members of the same species (a behaviour transferrable to dominant humans) and lack of a tendency to panic when fenced. Thousands of years ago, humans domesticated every possible large wild mammal species worth domesticating, with the result that there have been no significant additions in modern times, despite the efforts of modern science.

Eurasia ended up with the most domesticated animal species in part because it is the world's largest land mass and offered the most wild species to begin with. That pre-existing difference was magnified 13,000 years ago at the end of the last Ice Age, when more than 80% of the large mammal species of North and South America became extinct, probably exterminated by the first arriving Indians. Those extinctions included several species that might have furnished useful domesticated animals had they survived, such as North American horses and camels. As a result, American Indians inherited far fewer species of big wild mammals than did Eurasians, leaving them only with the llama/alpaca as a domesticate. Differences between the Old and New Worlds in domesticated plants are qualitatively similar to these differences in domesticated mammals, though the difference is not so extreme.

A further reason for the higher local diversity of domesticated plants and animals in Eurasia than in the Americas is that Eurasia's main axis is east/west,

whereas the main axis of the Americas is north/south.... Eurasia's east/west axis meant that species domesticated in one part of Eurasia could easily spread thousands of miles at the same latitude, encountering the same daylength and climate to which they were already adapted. As a result, chickens and citrus fruit domesticated in South-east Asia quickly spread westwards to Europe, horses domesticated in the Ukraine quickly spread eastwards to China and the sheep, goats, cattle, wheat and barley of the Middle East quickly spread both west and east.

In contrast, the north/south axis of the Americas meant that species domesticated in one area could not spread far without encountering daylengths and climates to which they were not adapted. As a result, the turkey never spread from Mexico to the Andes; llamas/alpacas never spread from the Andes to Mexico, so that the Indian civilizations of Central and North America remained entirely without pack animals; and it took thousands of years for the corn that evolved in Mexico's climate to become modified into a corn adapted to the shorter growing season and seasonally changing daylength of North America. That seems to be the main reason why North America's Mississippi Valley, which you might think should have been fertile enough to support a populous and politically advanced Indian society, did not give rise to one until around 1000 [C.E.], when a variety of corn adapted to temperate latitudes was finally developed.

Eurasia's domesticated plants and animals were important for several other reasons besides letting Europeans develop nasty germs. Domesticated plants and animals yield far more calories per acre than do wild habitats, in which most species are inedible to humans. As a result, populations of farmers and herders are typically ten to 100 times greater than those of hunter-gatherers. That fact alone explains why farmers and herders almost everywhere in the world have been able to push hunter-gatherers out of land suitable for farming and herding. Domestic animals revolutionized land transport. They also revolutionized agriculture, by letting one farmer plough and manure much more land than the farmer could till or manure by his/her own efforts. In addition, hunter-gatherer societies tend to be egalitarian and have no political organization beyond the level of the band or tribe, whereas the food surpluses and storage made possible by agriculture permitted the development of stratified societies with political elites. The food surpluses produced by farmers also accelerated the development of technology, by supporting craftspeople who did not raise their own food and could instead devote themselves to developing metallurgy, writing, swords and guns....

Thus, we began by identifying a series of proximate explanations—guns, germs and so on—for the conquest of the Americas by Europeans. Those proximate factors seem to me ultimately traceable in large part to the Old World's greater number of domesticated plants, much greater number of domesticated animals and east/west axis. The chain of causation is most direct in explaining the Old World's advantages of horses and nasty germs. But domesticated plants and animals also led more indirectly to Eurasia's advantage in guns, swords, ocean-going ships, political organization and writing, all of which were products of the large, dense, sedentary, stratified societies made possible by agriculture....

## Conclusion and Outlook

As for the overall meaning of this whirlwind tour through human history, it is that our history has been moulded by our environment. The broadest pattern of human history—namely, the differences between human societies on different continents—seems to me to be attributable to differences in continental environments. In particular, the availability of wild plant and animal species suitable for domestication, and the ease with which those species could spread without encountering unsuitable climates, have contributed decisively to the varying rates of rise of agriculture and herding, which in turn have contributed decisively to human population numbers, population densities and food surpluses, which in turn contributed decisively to the development of writing, technology and political organization.

## Using Environmental History

WILLIAM CRONON

When I first started teaching a lecture course on American environmental history at Yale over half a decade ago, I came to the end of the semester feeling that despite all the rough spots and gaps, it had gone as well as I could have expected. My ordinary practice on such occasions is to distribute teaching evaluations during the penultimate week of classes so I can read students' comments and report back to them on what they collectively see as the strengths and weaknesses of the course. When I did this for the new environmental history class, I was taken aback to discover that despite my students' enthusiasm for the course, the vast majority seemed profoundly depressed by what they had learned in it. I was unprepared for this reaction. What my students had apparently concluded from their encounter with my subject was that the American environment had gone from good to bad in an unrelentingly depressing story that left little or no hope for the future. Because my own feelings about the matter were not nearly so bleak, I had not intended to lead students to this dreary conclusion, and the more I thought about it, the more it seemed to me that I had no right to end the course on such a note. Whether or not my students' sense of despair was justified, I did not think it was a particularly useful emotion, either personally or politically. To conclude that the environmental past teaches the hopelessness of the environmental future struck me as a profoundly disempowering lesson—albeit a potentially self-fulfilling one—and I felt that my responsibility both as a teacher and as someone who cares about the future must be to resist such a conclusion.

I therefore wrote a final lecture that ended the class on a deliberately upbeat note with a very personal set of reflections about lessons I had extracted from my study of environmental history—the morals I drew from its stories—and the

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From William Cronon, "The Uses of Environmental History," *Environmental History Review* by John Opie (Fall 1993): pp. 1–3, 10–20. Copyright 1993 by American Society for Environmental History. Reproduced with permission of American Society for Environmental History in the format of Textbook via Copyright Clearance Center.

reasons why I continue to remain hopeful despite all the apparent reasons for feeling otherwise. Leaving aside my own worries about the appropriateness of temporarily turning my lectern into the secular equivalent of a pulpit, I'm persuaded that it was the right thing to do, for my students seemed genuinely grateful for this unusual bout of sermonizing on my part. I still end my environmental history course with a similar lecture. And yet I also think there's something odd about an academic subject that seems to require such an antidote against despair. Certainly I've never felt the need for a comparable closing lecture in my classes on the history of the American West, where I suspect that a residue of frontier optimism and high spiritedness somehow combine with moral outrage and regional pride to produce more ambiguous lessons. Because I've also encountered this sense of despair not just among students but among readers as well, I think it's worth asking why environmental history seems regularly to provoke such a response. A more general way of framing the question is to ask how our study of the environmental past affects our sense of the environmental present and future. Perhaps the simplest way to put this is just to ask: what are the uses of environmental history?

Do practitioners of environmental history have special reason to worry about their field's usefulness? Yes. Like the several other "new" histories born or reenergized in the wake of the 1960s—women's history, African-American history, Chicano history, gay and lesbian history, and the new social history generally—environmental history has always had an undeniable relation to the political movement that helped spawn it. The majority (but not quite all) of those who become environmental historians tend also to regard themselves as environmentalists. And so it is no accident that many of the most important works in the field approach their subjects with explicitly present-day concerns. Any number of environmental histories have clearly been framed to make contemporary political interventions. Roderick Nash's *Wilderness and the American Mind* has played a significant role in helping frame debates about wilderness protection in the three decades since its publication. Samuel Hays's *Conservation and the Gospel of Efficiency and Beauty, Health, and Permanence*, though less obviously partisan in their politics than Nash's book, speak just as powerfully to major trends in conservation and environmental politics in the twentieth century. Among the most consistently interventionist of environmental historians has been Donald Worster, whose unflinching moral vision has never failed to produce works of history that are also passionately committed to change. *Nature's Economy* critiqued the twentieth-century evolution of ecological science by seeking to rehabilitate an older natural-history tradition that had fallen into disrepute with many modern ecologists, while *Dust Bowl* and *Rivers of Empire* located the origins of environmental degradation in capitalist world-views and modes of production that are as alive in the present as they have been in the past. Carolyn Merchant joined Worster in bringing an environmentalist perspective to the history of science, but combined it with a more feminist approach to argue in *The Death of Nature* that western science has harmed nature and women in parallel ways; her *Radical Ecology*, though less historical, is still more activist in its efforts to intervene in contemporary political struggles. Even scholars whose work has



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been less explicitly political have consciously sought to make it relevant to contemporary environmental concerns. Joel Tarr's many studies of pollution and waste streams have always aimed to address the concerns of contemporary policymakers, while Steven Pyne's epic histories of fire have consistently tried to persuade present-day resource managers of the complexity of their task. Pyne has even gone so far as to author a textbook on fire management practices. And so on and on. The list of such interventions is long, and applies in varying degrees to the majority of historians who work in this field. So I think we can take it as a given that many if not most environmental historians aspire to contribute to contemporary environmental politics: they want their histories to be useful not just in helping us understand the past, but in helping us change the future....

One reason I emphasize the importance of our historical practice is that there are impulses within environmentalism that are quite strongly *ahistorical* or even *antihistorical*, placing environmental history in some considerable but little noticed tension with the larger political movement that helped spawn it. This tension is fascinating in its own right, and it significantly complicates the already difficult task that environmental historians face in trying to make themselves "useful" to their fellow environmentalists. One of the longstanding impulses that environmentalism shares with its great ancestor, romanticism, has been to see human societies, especially those affected by capitalist urban-industrialism and the cultural forces of modernity, in opposition to nature. Ironically, environmentalism often commits itself to a fundamentally dualistic vision even as it appeals for holism. According to the standard terms of this dualism, nature is assumed to be stable, balanced, homeostatic, self-healing, purifying, and benign, while modern humanity, in contrast, is assumed to be environmentally unstable, unbalanced, disequilibrating, self-wounding, corrupting, and malign.

Implicit in this opposition is the belief that ideal nature is essentially without history as we know it, save on the very long time-scales that affect plate tectonics, biological evolution, and climatic change. Another way of putting this is to say that natural time is cyclical time, while the time of modern humanity is linear. Time's cycle is the proof of nature's self-healing homeostasis and equilibrium, while time's arrow is the proof of humanity's self-corrupting instability and disequilibrium. Humanity's arrow is the fall, while nature's cycle is salvation....

However one may feel about this utopian environmentalist vision—and it has many attractive features—it collides at numerous points with the intellectual agenda that environmental historians have set for themselves. Our task, after all, far from trying to escape from history into nature, is to pull nature itself into the stream of human history. Whatever affection we may feel for the attractions of cyclical time and natural equilibrium, our chief stock in trade is linear time and disequilibrium: we study change....

Let me move toward a close by offering what seem to me to be some of the core lessons that make environmental history useful not just in its specific claims but in its habits of thought. I'll state these as a general set of very broad, very

simple morals for the stories we've been telling. They are among the deepest articles of faith for at least this environmental historian, articles of faith which I suspect many of my colleagues share.

### **1. All human history has a natural context.**

This is so obvious to most environmental historians that it is almost a truism of our subfield, and yet it is also the claim that seems to come as the greatest surprise to our colleagues.... Our strategy has been to argue for a dialogue between humanity and nature in which cultural and environmental systems powerfully interact, shaping and influencing each other, without either side wholly determining the outcome. One can restate this prescriptively as follows: *in studying environmental change, it is best to assume that most human activities have environmental consequences, and that change in natural systems (whether induced by humans or by nature itself) almost inevitably affects human beings.* As a corollary, most environmental historians would add that human beings are not the only actors who make history. Other creatures do too, as do large natural processes, and any history that ignores their effects is likely to be woefully incomplete.

### **2. Neither nature nor culture is static.**

This is the historicist argument I've already mentioned. Any vision of a past human place in nature that posits an ideal relationship of permanent stability or balance must defend itself against almost overwhelming evidence to the contrary. Descriptions of historical eras in which human populations were supposedly in eternal equilibrium with equally stable natural systems are almost surely golden-age myths. A comparable rejection of stasis has occurred within the modern science of ecology, where the notion of a permanent climax community as postulated by Frederic Clements and his followers now seems thoroughly discredited. In its stead, we have a newly dynamic, even stochastic or chaotic ecology in which history plays a crucial role in shaping the pattern and process of ecosystems whether or not people are involved.

Recognizing the dynamism of natural and cultural systems does not, of course, mean that all change is good or that there are no benchmarks for comparing one kind of change with another. Most past societies, for instance, have not altered the natural world at anything like the rate or scale that has typified the modern era.... The insights of environmental history tend to be powerfully anti-essentialist, lying in the middle ground between the golden-age myth of permanent equilibrium and the economic myth of a reductively universal human nature. Our work suggests that nature and culture change all the time, but that the *rate* and *scale* of such change can vary enormously.... Restated prescriptively, this suggests that *the relationship between nature and culture should always be viewed as a problem in comparative dynamics, not statics.* Naive assumptions about the stability of natural systems can produce behavior that is as environmentally destructive as it is culturally inappropriate. As a corollary, essentialist arguments about past cultures and environments are almost always historically suspect.

### **3. All environmental knowledge is culturally constructed and historically contingent—including our own.**

On the surface, this will probably seem the most radical challenge that environmental history has to offer environmentalists who regard nature as a source of absolute authority for their vision of how people ought to behave in the world. Here again we encounter the problem of sacred versus historical time.... The historicist impulse seems to undermine sacred knowledge and replace it with a relativist world in which nature is apparently no more than what we think it is, with literally everything up for grabs. If static nature is our moral compass, then historicism threatens to set us adrift on an unfamiliar sea with no way of taking our bearings....

Let me sum up this third lesson more prescriptively: *recognizing the historical contingency of all knowledge helps us guard against the dangers of absolute, decontextualized “laws” or “truths” which can all too easily obscure the diversity and subtlety of environments and cultures alike.* An historical, social-constructionist perspective takes seemingly transparent, absolute environmental “facts” and places them in cultural contexts which render them at once more problematic, more interesting, and more instructive. Paradoxically, by making reality more contingent the historicist approach to knowledge lends greater realism to our understanding of nature and culture alike.

My final lesson may seem oddly put, but seems to me the core of what sets environmental history apart from most other fields that seek to understand and influence the way we relate to the natural world. It describes a peculiar quality that characterizes most historical writing and sets it apart from the social and natural sciences. It is simply this:

### **4. Historical wisdom usually comes in the form of parables, not policy recommendations or certainties.**

The significance of this point is hardly intuitive for anyone who is not a historian. Whenever I lecture to the general public or to scholars in the social or natural sciences, I’m invariably asked afterwards for my predictions about the future course of environmental change. Just as invariably, I explain that historians usually make reluctant prophets, despite the teleological similarities between the stories we tell about the past and the prophecies that others may wish us to make about what will happen in the future.... Because historians cannot help but respect the awesome, terrifying complexity of past cause and effect, and because we recognize the dangers of teleology even as we embrace it as a necessary consequence of the narrative form, most of us—unlike many of our colleagues in the sciences—are reluctant to predict the future course of events.

This is not to say that we are silent about the future, or that we regard our histories as irrelevant to present concerns. Instead we adopt a much older, albeit less seductively scientific, rhetorical strategy. Rather than make *predictions* about what *will* happen, we offer *parables* about how to interpret what *may* happen.

Strange as it may sound, I believe this may be the most important contribution we environmental historians can make in a world where expert knowledge has for the most part forgotten the peculiar form of wisdom that the parable represents....

### Ground for Hope

Is telling parables about nature and the human past a useful thing to do? Yes. I believe so in my bones, which is what I told my students when they expressed despair about the seemingly hopeless lessons they thought they had learned from our course in environmental history. Let me close by returning for a moment to my secular pulpit to repeat some of the articles of faith I shared with those students.

The answers we environmental historians give to the question “What’s the story?” have the great virtue that they remind people of the immense human power to alter and find meaning in the natural world—and the even more immense power of nature to respond. At the same time, they remind us that whatever we do in nature, we can never know in advance all the consequences of our actions. This need not necessarily point toward despair or cynicism, but rather toward a healthy respect for the complexity and unpredictability of history, which is much akin to the complexity and unpredictability of nature itself. The proper lesson of such complexity, I believe, should be to teach us humility. It should make us more critical of our own certainty and self-righteousness, and deepen our respect for the subtlety and mystery of the lives we lead on this planet, entangled as we are in the warp and woof of linear and cyclical, secular and sacred time....

By telling parables that trace the often obscure connections between human history and ecological change, environmental history suggests where we ought to go looking if we wish to reflect on the ethical implications of our own lives.

And that, on reflection, seems quite a useful thing to do.

### Interpreting Environmental History

CAROLYN MERCHANT

In *The Hidden Wound*, published in 1989, environmentalist Wendell Berry writes that “the psychic wound of racism has resulted inevitably in wounds in the land, the country itself.” When he began writing the book in 1968 during the civil rights movement, he tells us, “I was trying to establish the outlines of an understanding of myself, in regard to what was fated to be the continuing crisis of my life, the crisis of racial awareness.” Berry’s book is an effort to come to terms with the environmental history of race as reflected in his family’s history as slaveholders, in his own childhood on a Kentucky farm in the segregated South, and in his adult life as a conservationist and environmentalist.

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Adapted from Carolyn Merchant, “Shades of Darkness: Race and Environmental History,” *Environmental History*, 8, no. 3 (July 2003): 380–394 and Merchant, “Gender and Environmental History,” *Journal of American History*, 76, no. 4 (March 1990): 1117–1121.

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Over the past several decades, environmental historians, like other historians, have become increasingly conscious of the place of race, gender, and class in the interpretation of history. Environmental history has widened its scope to include questions of the meanings and relationships between the environment and the roles played by people of color, by women and men, and by rich and poor. Environmental historians have questioned prejudices such as using environmental conditions and apparent human adaptations to justify slavery in the hot, humid South. They have looked at how women have used and changed the environment in arid, treeless locales, such as the Great Plains. And they have studied environmental conditions and human health in urban neighborhoods and industries in which poor people live and work in a capitalist society that exploits wage labor for the sake of wealth, power, and privilege.

In interpreting environmental history, therefore, one needs to ask probing questions such as: What is race and how is it historically and socially constructed at different times and places? What is gender and how do gender roles change over time in different environments and under different social circumstances? How do different types of societies in different environments, from Native American tribal groupings, to rural farming communities, to industrial capitalist economies foster various egalitarian, hierarchical, or class structures that define people and their access to a good life? What is the character of a just society in which environmental goods and services are distributed in humane ways and in which all people have access to a high quality of life? Historical documents and essays help to answer such questions and to reveal hidden assumptions underlying the writer's own race, gender, and class background. What follows are some examples of the ways in which race, class, and gender enter into the interpretation of environmental history.

In recent years, environmental historians have reflected on the place of racial awareness in the field and have begun the process of writing an environmental history of race. They have explored the negative connections between wilderness and race, cities and race, toxic wastes and race, and their reversal in environmental justice and have analyzed the ideology and practice of environmental racism. These include the following perspectives:

- Native Americans were removed from the lands they had managed for centuries, not only during settlement, as is well known, but during the creation of the national parks and national forests. Indians resisted these moves in an effort to maintain autonomy and access to resources.
- American Indians and African Americans perceived wilderness in ways that differed markedly from those of white Americans.
- Slavery and soil degradation are interlinked systems of exploitation and deep-seated connections exist between the enslavement of human bodies and the enslavement of the land. Blacks resisted that enslavement in complex ways that maintained African culture and created unique African American ways of living on the land.
- A “coincidental order of injustice”—in environmentalist Jeffrey Romm’s terminology—reigned in post-Civil War America as emancipated blacks in

the South were expected to pay for land with wages at the same time that free lands taken from Indians were being promoted to whites via the Homestead Act and other land acts.

- African Americans bore the brunt of early forms of environmental pollution and disease as whites fled urban areas to the new streetcar suburbs. Black neighborhoods became toxic dumps and black bodies became toxic sites. Out of such experiences arose African American environmental activism in the Progressive Era and the environmental justice movement of the late twentieth century.
- Over time the meanings attached to skin colors have been redefined in ways that reinforce environmental and institutional racism.

### **Race and Environmental History**

Viewed from the perspective of race, the rich resources of the American environment were developed at the expense of Indians and blacks. From the ideological standpoint of European settlers, the wilderness and its native peoples needed to be tamed, improved, and civilized. Native American lands were appropriated by Europeans as free lands, while Africans were enslaved to provide the free labor that enabled many European Americans to claim political freedom. Warfare, disease, and dependency on trade goods all undercut Indian power to resist European expansion. As Indian populations declined, African American populations increased, first from the slave trade and then, after its official demise in 1808, through smuggling and natural increase as tobacco dominance gave way to the cotton boom. On economic grounds, the slave system both caused the destruction of black bodies and contributed to the rapid degradation of Southern soils, as tobacco, rice, sugar, and cotton became cash crops in an expanding world market.

Despite their racial degradation, however, Native and African Americans maintained their cultural identities, making significant contributions to agriculture and hence to environmental history. Indians contributed maize (corn), beans, squash, and pumpkins to America as well as Europe. African foods were stowed on slave ships and then grown in provision gardens. As a result, African, Native American, and European foods became mixed together, mutually influencing each other. Slave traders, as well as slaves, introduced crops, having obtained them in other parts of the world. Yams were brought by slaves from Africa. Eggplant came from Africa to South America, whence it was brought by Portuguese slave trading ships to the United States. Peanuts came from South America and were introduced into Virginia by African cooks who arrived aboard slave ships. But food is also a cultural construct and is therefore not only good to eat, but is important to people in maintaining historical and cultural identities. Rituals and traditions, such as songs and dances, were important in association with the foods grown by Indians and brought by black people from Africa. And from an environmental standpoint, both Native American and African American gardens exhibited ecological effects that enhanced food production.

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Crops grown together kept down insect pests and weeds, hence gardens packed with crops might result in relatively higher yields per acre than fields of monocultures grown alone. A racial perspective is therefore an important element in understanding environmental history.

## Class and Environmental History

A class perspective is likewise important for interpreting environmental history. People at all levels of society use natural resources and contribute to environmental pollution. Working class people often interact most directly with the land in extracting resources for the market. Fishers, loggers, trappers, farmworkers, ironworkers, coal miners, and industrial workers supply much of the labor for the food and fuel on which society depends. They are in turn the most vulnerable to environmental disasters such as droughts, fires, fishery collapses, mine accidents, fluctuations in the labor supply, and market prices. Middle- and upper-class citizens are often the most conspicuous consumers of environmental goods and energy sources. From automobiles and gasoline to television sets and computers, those with the most wealth and status often extract the most from nature and return the most waste.

On the other hand, many of those who are closest to the land practice conservation and have developed an intimate environmental awareness, while many middle- and upper-class individuals become environmental leaders and activists who help to spear conservation movements and to develop environmentally friendly technologies. Knowing who is writing environmental history is also important. Lower-class workers are usually too busy making a living to write their stories or leave literary legacies, while educated elites contribute much of the material that can be replicated in printable sources. In reading environmental history, therefore, it is important to ask who is writing, what they are advocating, and from what class or environmental perspective they are making their argument.

## Gender and Environmental History

A gender perspective can also add to environmental history in important ways. Women and men have historically had different roles in production relative to the environment. In subsistence modes of production such as those of native peoples, women's impact on nature is immediate and direct. In gathering-hunting-fishing economies, women collect and process plants, small animals, bird eggs, and shellfish and fabricate tools, baskets, mats, slings, and clothing, while men hunt larger animals, fish, construct weirs and hut frames, and burn forests and brush. Because water and fuelwood availability affect cooking and food preservation, decisions over environmental degradation that dictate when to move camp and village sites may lie in the hands of women. In horticultural communities, women are often the primary producers of crops and fabricators of hoes, planters, and digging sticks, but when such economies are transformed by markets, the cash economies and environmental impacts that ensue are often

controlled by men. Women's access to resources to fulfill basic needs may come into direct conflict with male roles in the market economy, as in Seneca women's loss of control over horticulture to male agriculture and men's access to cash through greater mobility in nineteenth-century America or in India's chipco (tree-hugging) movement of the past decade, wherein women literally hugged trees to protest declining access to fuelwood for cooking as male-dominated lumbering expanded.

In the agrarian economy of colonial and frontier America, women's outdoor production, like men's, had immediate impact on the environment. While men's work in cutting forests, planting and fertilizing fields, and hunting or fishing affected the larger homestead environment, women's dairying activities, free-ranging barnyard fowl, and vegetable, flower, and herbal gardens all affected the quality of the nearby soils and waters and the level of insect pests, altering the effects of the microenvironment on human health. In the nineteenth century, however, as agriculture became more specialized and oriented toward market production, men took over dairying, poultry-raising, and truck farming, resulting in a decline in women's outdoor production. Although the traditional contributions of women to the farm economy continued in many rural areas and some women assisted in farm as well as home management, the general trend toward capitalist agribusiness increasingly turned chickens, cows, and vegetables into efficient components of factories within fields managed for profits by male farmers.

In the industrial era, as middle-class women turned more of their energies to deliberate child rearing and domesticity, they defined a new but still distinctly female relation to the natural world. In their socially constructed roles as moral mothers, they often taught children about nature and science at home and in the elementary schools. By the Progressive era, women's focus on maintaining a home for husbands and children led many women ... to spearhead a nationwide conservation movement to save forest and waters and to create national and local parks. Although the gains of the movement have been attributed by historians to men such as President Theodore Roosevelt, forester Gifford Pinchot and preservationist John Muir, the efforts of thousands of women were directly responsible for many of the country's most significant conservation achievements. Women writers on nature such as Isabella Bird, Mary Austin, and Rachel Carson have been among the most influential commentators on the American response to nature.

At the level of cognition as well, a sensitivity to gender enriches environmental history. Native Americans, for example, construed the natural world as animated and created by spirits and gods. Origin stories included tales of mother earth and father sky, grandmother woodchucks and coyote tricksters, corn mothers and tree spirits. Such deities mediated between nature and humans, inspiring rituals and behaviors that helped to regulate environmental use and exploitation. An animate earth and an I/thou relationship between humans and the natural world does not prevent the exploitation of resources for human use, but it entails an ethic of restraint and propitiation by setting up rituals to be followed before mining ores, damming brooks, or planting and harvesting crops.



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The human relationship to the land is intimately connected to daily survival. Environmental history can thus be made more complete by including a gender analysis of the effects of women and men on ecology and their roles in production.

When mercantile capitalism, industrialization, and urbanization began to distance increasing numbers of male elites from the land in seventeenth-century England and in nineteenth-century America, the mechanistic framework created by the “fathers” of modern science legitimated the use of nature for human profit making. The conception that nature was dead, made up of inert atoms moved by external forces, that God was an engineer and mathematician, and that human perception was the result of particles of light bouncing off objects and conveyed to the brain as discrete sensations meant that nature responded to human interventions, not as active participant, but as passive instrument. Thus the way in which world views, myths, and perceptions are constructed by gender at the cognitive level can be made an integral part of environmental history.

## Gender and Reproduction

Additionally, ideas drawn from feminist theory suggest the usefulness of another level of analysis—reproduction—that has both biological and social aspects. First, all species reproduce themselves generationally and their population levels have impacts on the local ecology. But for humans, the numbers that can be sustained are related to the mode of production: More people can occupy a given ecosystem under a horticultural than a gathering-hunting-fishing mode, and still more under an industrial mode. Humans reproduce themselves biologically in accordance with the social and ethical norms of the culture into which they are born. Native peoples adopted an array of benign and malign population control techniques such as long lactation, abstention, coitus interruptus, the use of native plants to induce abortion, infanticide, and senilicide. Carrying capacity, nutritional factors, and tribally accepted customs dictated the numbers of infants that survived to adulthood in order to reproduce the tribal whole. Colonial Americans, by contrast, encouraged high numbers of births owing to the scarcity of labor in the new lands. With the onset of industrialization in the nineteenth century, a demographic transition resulted in fewer births per female. Intergenerational reproduction, therefore, mediated through production, has impact on the local ecology.

Second, people (as well as other living things) must reproduce their own energy on a daily basis through food and must conserve that energy through clothing (skins, furs, or other methods of bodily temperature control) and shelter. Gathering or planting food crops, fabricating clothing, and constructing houses are directed toward the reproduction of daily life.

In addition to these biological aspects of reproduction, human communities reproduce themselves socially in two additional ways. People pass on skills and behavioral norms to the next generation of producers, and that allows a culture to reproduce itself over time. They also structure systems of governance and laws that maintain the social order of the tribe, town, or nation. Many such laws and

policies deal with the allocation and regulation of natural resources, land, and property rights. They are passed by legislative bodies and administered through government agencies and a system of justice. Law in this interpretation is a means of maintaining and modifying a particular social order. These four aspects of reproduction (two biological and two social) interact with ecology as mediated by a particular mode of production.

While in most societies governance may have been vested in the hands of men (hence patriarchy), the balance of power between the sexes differed. In gatherer-hunter and horticultural communities, extraction and production of food may have been either equally shared by or dominated by women, so that male (or female) power in tribal reproduction (chiefs and shamans) was balanced by female power in production. In subsistence-oriented communities in colonial and frontier America, men and women shared power in production, although men played dominant roles in legal-political reproduction of the social whole. Under industrial capitalism in the nineteenth century, women's loss of power in outdoor farm production was compensated by a gain of power in the reproduction of daily life (domesticity) and in the socialization of children and husbands (the moral mother) in the sphere of reproduction. A gender perspective on environmental history therefore both offers a more balanced and complete picture of past human interactions with nature and advances its theoretical frameworks.

### Conclusion

Race, class, and gender are lenses through which to view history and interpret human interactions with the environment. How these three categories are constructed socially and culturally, how and why they change over time, and why they are important add to the complexity of history. They help us to envision the possibility of a socially just world that could be a better place in which to live.

## Global Environmental History

J. DONALD HUGHES

The need to study environmental history on a planetary scale is self-evident. Environmental factors operated beyond single cultures and regions even in early times, with the spread of epidemics, the diffusion of agricultural innovations, and the movement of human populations. Global environmental change accelerated in the early modern period, with biological exchanges brought about by explorers, traders, and settlers. Environmental issues in the twentieth and early twenty-first centuries have increasingly assumed worldwide proportions. The atmosphere carries pollutants, radioactive particles, and volcanic dust from their sources across the continents, is the medium of catastrophic storms, and its chemical composition and rising temperature reflect the “greenhouse

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From J. Donald Hughes, *What Is Environmental History?* (Malden, MA: Polity Press, 2006), Ch. 5, “Global Environmental History,” pp. 77–86, excerpts.

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effect,” a cause of global warming. The world’s oceans make up seven-tenths of the Earth’s surface, and affect not only the coastlands and islands, but the Earth as a whole by serving as an “ultimate sink,” absorbing and emitting gases, including water vapor and carbon dioxide, and their temperature may ultimately have an even greater effect on global warming than that of the atmosphere. Human activities today are less often circumscribed by specific ecosystems (although even these cross national borders), and more often extend throughout the biosphere that transcends every national frontier. World trade has ensured that food energy produced by soils in one country may be consumed on a distant continent, and that the price of oil will have effects far from the sources of that resource. Distant demands have encouraged overfishing, and wild species have been reduced to near or total extinction. All these factors can be themes of environmental history, so it seems to follow that at least some environmental historians would take world history as their scale. But it is daunting. If the Earth is a small planet, it is still enormous when measured by the perceptions of its inhabitants, and in ecological terms, it is exceedingly varied. It is a challenge for any author to try to embrace it all or to say anything in general that is true of its diversity. Even so, a few have made an attempt at a synthesis.

## Books on World Environmental History

World environmental history is, of course, the most widely embracing approach to the subject, and the one that potentially can erase the greatest number of borders and provide useful international comparisons. It is also one of the earliest kinds of environmental history to appear. A cross-fertilization between history and the sciences, particularly ecology, produced abundant fruit in world environmental history. This was the thrust of an international symposium at Princeton chaired by Carl O. Sauer, Marston Bates, and Lewis Mumford in 1955. Its proceedings, entitled *Man’s Role in Changing the Face of the Earth*, edited by William L. Thomas, Jr., was a foundational collection of essays spanning the planet and the chronological sweep of human history, and laid the foundation for later work bridging science and history.... Alfred Crosby’s earlier work, including his groundbreaking *The Columbian Exchange*, combined medical and ecological science and history to demonstrate the biological impact of the Europeans and their domestic animals and plants, and the diseases to which they had developed resistance, on the Americas. He then expanded his purview, in *Ecological Imperialism*, showing that the Europeans toted their “portmanteau biota” to temperate neo-Europes in many hitherto isolated lands, where they achieved demographic takeovers....

Jared Diamond, a master of several fields who also justifiably claims to be an environmental historian, and who is eclectic in his sources of evidence, has written *Guns, Germs, and Steel: The Fates of Human Societies*, and *Collapse: How Societies Choose to Fail or Succeed*, which treat the influence of geography and biology on history, and human cultural responses, from the earliest times in often arresting ways. They are also engagingly written and, uniquely for books in this field, both have spent many weeks in the newspaper best-seller lists. They are undoubtedly the environmental history books most widely read by the general public, and deserve attention for that reason as well as their intrinsic merits.

In *Guns, Germs, and Steel*, Diamond asks why technologically advanced civilizations appeared in the places they did, among some societies and not among others. He rejects the idea that it might be because certain peoples are more intelligent and inventive than others, since average intelligence has been shown to be more or less the same across all human groups, racially speaking. The answer, then, must lie in differences of geography and environment. Among these differences are the availability or unavailability of domesticable plants and animals, and the orientation of arable continental lands on an east–west axis (offering domesticates the ability to spread to areas at similar latitudes), rather than a north–south axis. Many critics have regarded this line of argument as environmental determinism, but Diamond rejects that label. The mere presence of environmentally suitable locales does not mean that any people living there will develop an advanced technology.

*Collapse* can be seen as a defense against the criticism of environmental determinism. In it, Diamond attempts to answer a question that is the converse of the one in *Guns, Germs, and Steel*. To paraphrase his subtitle, why do societies choose to fail or succeed? Examining the historical collapses of a number of societies, Diamond groups the reasons for collapse into five categories: climatic change, hostile neighbors, trade partners, environmental problems, and a society's response to environmental problems. It is in the last category that a society may "choose" to fail or succeed, and if it can choose, then its environment does not totally determine the outcome. Diamond provides illustrations of cases where two societies existed at the same time in much the same place, but one failed and the other succeeded (as exemplary pairs, the Norse and Inuit in Greenland, and Haiti and the Dominican Republic on Hispaniola). Another pair, however, Easter Island (Rapa Nui) and Tikopia, both Polynesian societies on Pacific islands, raises a further question. Easter Island was completely denuded of trees by its inhabitants and suffered a population collapse, but Tikopia has retained a stable population and is still tree-covered.

Diamond and his colleague Barry Rolett identified nine environmental factors that affect the likelihood of deforestation on Pacific islands, and it appears that Tikopia does better than Easter Island on about five out of the nine. Easter Island is near the bottom on all nine, and if the environmental deck was stacked so severely against Easter Island, can it really be said that the Easter Islanders "chose" to fail? Well, the wealth and religion of the Tikopia were based on pigs, and they nevertheless chose to kill all the pigs because they were consuming the resources of the small island. The prestige and religion of the Easter Islanders were based on the erection of huge stone statues, and they kept putting them up until all the trees, whose trunks had been used to move them, were gone. Why did one people, and not the other, see the problem they had and act to alleviate it? Diamond speculates on possible answers, and gives plausible reasons. Although a definitive one may escape us, he should be thanked for investigating the question....

A work ... by J. Donald Hughes, the present author, [is] entitled *An Environmental History of the World: Humankind's Changing Role in the Community of Life*. My book offers a chronological sweep from prehistory to the contemporary. Each chapter consists of an introduction to a broad chronological period followed by case studies of selected periods and places. My approach emphasizes

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the mutual relationships between human societies and the ecosystems of which they are part, investigating the ways in which environmental changes, often the result of human actions, have caused historical trends in human societies. The chapters covering the twentieth century discuss the physical impact of the huge growth in population and technology, and the human responses to these trends. Moral obligations to nature and the conundrum of a sustainable balance between technology and the environment are also considered.

Sing C. Chew, a sociologist, has turned into a competent historian and written an environmental history of 5,000 years, from the appearance of the first cities to the present, *World Ecological Degradation*. As the title indicates, this is what many environmental historians term a declensionist narrative [a story of decline from an earlier, more perfect environment]. Chew states his thesis and follows it with admirable directness: urbanized societies have exploited and depleted the environment, everywhere and throughout history. The most powerful engines of destruction, he maintains, are accumulation, urbanization, and population growth. By accumulation, he designates the acquisition of wealth not simply in the form of financial capital, but all the material aspects of civilization, which are produced from the physical resources of the natural environment and inevitably exhaust them. Urbanization drives an intensive utilization of resources that transforms the landscape. Population growth exacerbates the first two phenomena and generates increasing stress on the environment. Among the processes of ecological degradation, Chew treats one in detail: deforestation. It is an excellent choice as an example, since it occurred from the discovery of fire to the present, and can be documented and measured. It stands as a proxy for other forms of degradation that accompany it, such as floods, erosion, habitat loss, and the deterioration of ecosystems. One of the most original elements in his analysis is the idea that “dark ages” are the result of expanding cultures exhausting the resources available to them. Though disasters for civilizations, these periods offer a measure of recovery to Nature. There have been individuals and groups that have objected to the trashing of the environment by societal elites. Why have these not had a greater effect in teaching humankind to avoid the “degradative encounters” that human communities experienced? Chew believes this is due in part to the domination of society by leading groups committed to “maximal utilization of resources for the most gains,” and in part to human irrationality....

Some studies have appeared that encompass world environmental history in a particular time period. The finest recent monograph in the field is a history of the last century by John R. McNeill: *Something New Under the Sun: An Environmental History of the Twentieth-Century World*. It is the first synoptic world environmental history of the twentieth century. McNeill traces the environmental and related social changes, unique in scale and often in kind, that characterize the period, and maintains that the twentieth century was different in kind, not only in degree, from any of the previous ones, in that “the human race, without intending anything of the sort, has undertaken a gigantic uncontrolled experiment on the earth.” Where a look at previous times is necessary to understand the twentieth century, he succinctly provides the background. He explains that contemporary culture is adapted to abundant resources, fossil fuel energy, and

rapid economic growth, patterns that will not easily be altered should circumstances change, and the behavior of human economy in the twentieth century has increased the inevitability of change. The engines of change are conversion to a fossil fuel-based energy system, very rapid population growth, and a widespread ideological commitment to economic growth and military power. McNeill includes a perceptive section on world economic integration. This book bids fair to become a classic of environmental history.

Another study of the environmental history of a historical period is by John F. Richards, with the title, *The Unending Frontier: The Environmental History of the Early Modern World*, covering the period between the fifteenth and eighteenth centuries. As the title suggests, Richards emphasizes frontiers as the places where environmental changes were occurring most rapidly. The argument of the book is that the salient patterns of the world were the expansion of Europeans across much of the rest of the globe and progress in human organization in Europe, India, and East Asia. A chapter discusses the state of our knowledge of climatic history; the Little Ice Age made its appearance during this time and its effects cannot be ignored. Richards' treatment is exemplary; he gives due importance to the geographical setting, the biological factors, the indigenous peoples whom he portrays neither as helpless victims nor as ecological saints, and the adaptations of the Europeans and their imported domestic animals, plants, and pathogens. The last section, entitled "The World Hunt," gives an extraordinary overview of the way in which Europeans ranged the world in search of organic resources and, treating them as inexhaustible, managed to reduce the incredible abundance and diversity of wildlife at the beginning of the Early Modern Period to a waning remnant at the end. He notes the economic advantages derived from the hunt and the environmental changes produced by the removal of species. Richards gives attention to the areas where the action was happening, and that means the frontiers, which are his central theme. He has little to say about older theatres where development had already occurred, such as the Mediterranean basin and Near East, or the areas beyond the frontiers where the full modern encounter was yet to take place, namely Oceania, Africa north of the area around the Cape, and the North American west.

This substantial volume can stand beside John McNeill's twentieth-century environmental history, *Something New Under the Sun*, as a complementary work. The two together almost cover the modern world; obviously what we need now is an environmental history of the nineteenth century to bridge the gap between them. Each of these authors notes that the world of the time he describes was unprecedented in terms of worldwide environmental changes caused by human economic activity, and both are right....

### Topics of Global Importance

Another category consists of studies and collections that are global in scope, but deal with special topics. These include books on world forest history, including the major recent monograph by Michael Williams, *Deforesting the Earth: From Prehistory to Global Crisis*, an authoritative masterwork that relates the historical

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course of human impact on forests across the world's continents and islands. Williams has the knack of providing just the right specific details to bring the narrative to life. To give an example, he does not just say that the demand for fuel in the sugar industry caused deforestation in the West Indies in the seventeenth century, but reports a request from Barbados for coal from England to boil sugar because there were no trees on the island. Again, to illustrate the widespread publicizing in the US of tropical rainforest destruction, he recalls an electronic billboard above the Hard Rock Café in Beverly Hills, California, that kept pace with the decreasing rainforest area as it flashed the decline toward zero....

On the history of fire, Stephen J. Pyne has given environmental historians a series of excellent books on fire in selected parts of the world, "Cycle of Fire," and an overview, *World Fire: The Culture of Fire on Earth*. The latter book is more than a history of forest fires. It is a global history of human involvement with the element of fire in all its forms from its origin in geological epochs to the high-tech fire powering the information revolution and the world market economy. Pyne includes cities, where the built environment served as fuel, as in London in 1666 and San Francisco in 1906. He elucidates the technology of fire from charcoal in metallurgy to gunpowder, the steam engine, and fossil fuels in the twentieth century, including cookery, the fiery philosophy of Heraclitus, and the Kyoto Protocol, all in proper context, and concludes with a look at fire in the new millennium. Pyne's style is the essence of scholarly accessibility.

On climate, Richard Grove and John Chappell's intriguing book, *El Niño: History and Crisis*, ... investigates the worldwide effects on human history of oscillating oceanic currents and heightened temperatures usually called *El Niño* (and its cooler counterpart *La Niña*). While *El Niño* proper is a phenomenon of the Pacific Ocean, these authors indicate its connection with a world system including periodic occurrences such as a similar oscillation in the North Atlantic, and the South Asian monsoon. These are examined as possibly contributing causes of historical events such as economic crises brought about by food shortages, and the consequent fall of governments....

The environmental effects of what many have called the American Empire extend far beyond areas directly administered by the US, of course. Richard Tucker takes on this subject in his careful, well-documented book, *Insatiable Appetite: The United States and the Ecological Degradation of the Tropical World*, covering the period from the 1890s to the 1960s. Tucker portrays important ways in which American business and government have impacted the warmer regions of the globe. The book is organized by types of renewable biological resources that were exploited, with chapters devoted to sugar, bananas, coffee, rubber, beef, and timber. The geographic regions emphasized are Latin America; the Pacific islands including Hawaii, the Philippines and Indonesia; and Liberia in West Africa. Tucker's intent is to describe the unsustainability of much of the development that occurred, and the biotic impoverishment including deforestation, loss of species, destabilization of soil and cropping systems, and other environmental damage that resulted, including its effects on people such as villagers and forest residents. The author's approach is balanced, but the overall picture is that of ecological disasters driven by exploitation....

### World History Texts

Environmental history has an increasingly prominent place in textbooks on world history. John McNeill asserts that the patterns of human environmental relations are the most important aspect of twentieth-century history, and a case might be made that this was no less true of preceding centuries and millennia, even if awareness was lacking. Prior to the past decade, world history textbooks had given little attention to environmental issues except possibly in their chapters on prehistory and on the late twentieth century. But at the present time environmental historians increasingly are listed among the co-authors, and there is evidence that their perspectives are now reflected across the entire time frame of some (but not all) of these books that are so important to the undergraduate education of the student generation of the early twenty-first century....

There is a recognition on the part of environmentalists and developers alike that to protect the environment is to curb development, and to develop is typically, if perhaps not inevitably, to degrade the environment. Human beings seem to want both goods, while recognizing their prevailing incompatibility. The new narrative of world history must have ecological process as its major theme. It must keep human events within the context where they really happen, and that is the ecosphere. The story of world history, if it is to be balanced and accurate, will inevitably consider the natural environment and the myriad ways in which it has both affected and been affected by human activities. Ecological process is a dynamic concept. It implies that the interrelationship of humans and the natural environment undergoes continual changes, some positive and some destructive. These changes make environmental history just as necessary as ecological science in explaining the present predicament of humankind and nature.



### FURTHER READING

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