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History as Natural History

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CHARLES DARWIN has been moldering in his grave now for a full century. But it is not death with which we associate his name; it is life, in all its abundance and variety. In particular, the argument he made for the natural origin of life, including humans, has been one of the most influential ideas in the world over that century's span. It was accepted a long while back by almost everyone within the reach of modern science, despite the persistent opposition of a raggle-taggle band of creationists. But for all that general acceptance, Darwin's ideas have not yet become working principles among several large groups of scholars. Take history, for example: reading the journals and dissertations in this field reveals the profound, continuing influence of Adam Smith, Karl Marx, and Sigmund Freud, but still there is no Darwin in our history, at least not as a tradition of historical theory. Evolution and history remain, after a hundred years, separate realms of discourse. There is little history in the study of nature, and there is little nature in the study of history. I want to show how we can remedy that cultural lag by developing a new perspective on the historian's enterprise, one that will make us Darwinians at last. It will require us to step back now and then from parliamentary debates, social mobility data, and the biographies of illustrious figures in order to examine more elemental questions that concern the long-running human dialogue with the earth.

This essay was published in the *Pacific Historical Review,* Volume 53, February 1984.

The contemporary disjunction between the study of history and of nature has a fairly obvious explanation. In the eighteenth-century world of the English parson-naturalist, there was no such split; antiquities and natural curiosities lay jumbled together in the same country cupboard.[1] As we moved away from that small rural community, the old broad-gauged, integrative "natural history" began to fragment into specializations. History increasingly became an archival pursuit, carried on by urban scholars; there was less and less dirt on it. Recently, however, that drift toward an *unnatural* history has run up against a few hard facts: dwindling energy supplies, population pressures on available food, the limits and costs of technology. A growing number of scholars, consequently, have begun to talk about something called "environmental history." In 1972 the *Pacific Historical Review* devoted an entire issue to this new inquiry, and three years later the American Society for Environmental History formed to promote the study in earnest.[2] If it understands its mission clearly and fulfills it, the new history will re-create, though in a more sophisticated form, the old parson-naturalist synthesis. It will, that is, seek to combine once again natural science and history, not into another isolated specialty, but into a major intellectual enterprise that will alter considerably our understanding of historical processes. What that inquiry involves, what our times have prepared us for, what I wish to propose here, is the development of an ecological perspective on history.[3]

Within the circle of American historians, there have been at least two individuals who earlier took steps towards creating an environmental *qua* ecological mode of analysis. But in both cases they failed to move the profession very far. I mean, of course, Walter Prescott Webb and James Malin. They reached different conclusions at times, but the two had much in common. They both grew up on the Great Plains when that region was still at the edge of white agricultural settlement; they were educated in the frontier, Turnerian school of historiography, which in turn owed something to Darwin's influence; they shared an interest in the problem of aridity and what it has meant for American culture; they were both willing to break down disciplinary fences and range far afield in geography and ecology to get answers to their questions.[4] Webb described his method with characteristic simplicity: "To take a vantage point on the land, and watch the actors approach it, knowing in advance what they will

meet up with, and having at least some idea of how they may react to it."[5] What he saw was how culture, especially in its material aspects, changes to meet the conditions set by nature; in other words, he saw a process of technological (and to a lesser extent, institutional) adaptation. Meanwhile, James Malin steeped himself in ecological theory, 1930s and 40s vintage, rejected much of it as biased, and applied what remained to his study of the North American grasslands—"not under any illusion," he wrote, "that history may thus be converted into a science, but merely as a way of looking at the subject matter and processes of history."[6]

These two innovative historians still have a few readers today, though their approach was never adequately thought out and the natural science in it is now obsolete. Of the two, Webb wears better, but he often seems to have been a gifted amateur, dealing in metaphors and schematics more than careful research. His work was always marred by a parochial desire to prove that the West was different and to find evidence that its environment made it so; at his worst he was a flagrantly mechanical determinist, at his best, a figure whom other historians have generally quoted more than followed.[7] Malin, on the other hand, was a crusty, unreconstructed Social Darwinist who wanted from nature a justification for free enterprise and economic individualism.[8] Their shortcomings were not all their own fault. They were in part due to their times and their profession's immaturity, in part due to their personal remoteness from a more demanding intellectual milieu. The ecological synthesis I propose ought to acknowledge generously their contribution, then pass on to other exemplars, other issues, and other worlds.

The new history begins where Malin and Webb left off, leaps to the more unfamiliar terrain of the German historian Karl Wittfogel, and from there sallies into the field of ecological anthropology, where we will find a lot going on that is useful. First, the Wittfogel terrain. It is not, I daresay, familiar to many American historians—and it ought to be. Perhaps it is unfamiliar because Wittfogel began with that unwelcome-in-America prophet Karl Marx and his theories of historical materialism and class dialectics. Eventually though, Wittfogel managed the not inconsiderable feat of translating those theories into an environmental interpretation of society and social change that had more of Darwin than of Marx in it. He came to the United States in 1934, an emigrant from Germany, just out of Hitler's concentration camps; he brought with him an established international name in Chinese studies. Before emigrating, he had published an article, "Geopolitics, Geographical Materialism, and Marxism" (1929), in which he emphasized the importance of natural factors in shaping a society's mode of production. The fundamental relation underlying

all social arrangements, he argued, is the one between humans and nature. Out of that bedrock interaction comes much of what historians seek to understand: economy, law, political power, social conflict, and so forth. Ignore that interaction, and we have lost the means to explain in the deepest sense what makes history.[9]

Wittfogel arrived at this position in attempting to solve a problem that earlier had baffled Marx: Why were the major civilizations of Asia so different from those of Europe, so lacking in capitalist development, and so unpromising for a Communist revolution? The answer, Marx had vaguely indicated, lay in the advanced water systems built by Asians to provide irrigation for their arid lands; from that base a distinct form of society had evolved in China, India, and the Near East.[10] This much Marx realized, but he was at the same time reluctant to see in nature much more than a passive landscape in which human labor toiled and created. It was Wittfogel who took the argument over and insisted that the natural environment is not really passive but rather is a powerful determining force throughout history. People are forever struggling with the land in an ongoing ecological dialectic: there is the gist of the Wittfogel theory. The earth gets changed in the unfolding dialectic, but so do the people. For example, in the absence of ample rainfall Asian farmers in several places brought water to their fields. Eventually they created what Wittfogel called a "hydraulic society."[11] As their manipulation of water became more and more large-scale, they were forced to reorganize their social structures into elaborate hierarchies of power—into a chain of pharaohs, emperors, bureaucracies, and highly centralized states. There could be no other arrangement of society so long as that ecological pattern, that techno-environmental base, remained in place.

The key question, then, that Wittfogel asked in 1929 was this: How does a society's interaction with nature lead to its own restructuring, to its evolution from one form to another? Later, in his most important work, *Oriental Despotism: A Study in Total Power,* published in 1957, he gave that question his most elaborate and controversial reply.[12] It is a monumental work, impressive in its learning and range, daring in its speculations. Unfortunately, it is also in parts a diatribe against "the communist menace," for Wittfogel had slowly made his way from being Marx's disciple to being a bitter cold warrior. As a consequence of that change in allegiance and the crusading spirit that accompanied it, many other Asian scholars came, somewhat unfairly I think and without sufficient analysis or discrimination, to dismiss his ecological ideas along with his anti-Communist polemics. And there was another unhappy result: those who had never discovered his earlier work—historians like Webb and

Malin, who might have found much in Wittfogel for their own studies of the arid American West and who needed his more advanced theoretical grounding—were not likely ever to do so. Those were sorry outcomes, brought on by Wittfogel himself. Nonetheless, the ecological question he raised is still there, waiting for historians to rediscover it and build on it a broad new interpretation of the past, one that will place human society firmly in, rather than beyond or above, nature.

If historians have tended to overlook or dismiss Wittfogel's work, the same cannot be said for anthropologists. There he has found a more appreciative audience, and to a large extent it is around his work on ancient irrigation that a discipline has coalesced within that discipline, called variously ecological anthropology, cultural ecology, and cultural materialism. So far has this study progressed that now it is the historian's turn to become learner and follower, seeking to apply the anthropologist's approach to the investigation of past societies. In what follows I will briefly review some of the main figures in ecological anthropology and their work, and then I will suggest a few ways in which history can and ought to join in promoting that perspective.

In the 1920s, during the same year that Webb was beginning his studies of the Great Plains, the anthropologist Clark Wissler introduced his "culture-area" concept.[13] It followed the geographic work of Ellsworth Huntington, Ellen Semple, Friedrich Ratzel, and J. J. E. Reclus, all of whom had stressed the importance of habitat and climate in developing cultural diversity. Wissler (and after him, Alfred Kroeber) was thoroughly familiar with diversity; he had made a lifelong study of American Indians, whose artifacts, social patterns, languages, and economics offered a bewildering variety of types. The culture-area hypothesis argued that those Indian cultural diversities formed discrete clusters on a map—and, more important, that those cultural clusters coincided with the spatial distribution of "natural areas," identified mainly by plant and animal food resources. What did that prove? Only that apparently there was some kind of link between culture and nature; nothing more firm than that about cultural causality would Wissler venture. The culture-area idea prompted several researchers to look at groups like the Eskimos and to observe how their environment might have placed limits on their cultural development, or put more positively, might have encouraged them to innovate and evolve in a new direction. After all, if the polar bear showed the influence of its experience with nature, was it inconceivable that Eskimo culture would do the same?

There were, however, problems in jumping from the evolution of bears to cultures. The bear indubitably is part of Darwin's web of life, interacting with other bears, other species, the climate and chemistry of its ecosystem, adapting to that system through natural selection operating on its genotype. But culture is a more intangible phenomenon; much of it is carried around in people's heads, with no genetic mechanism involved in its transmission. Does that distinction make a real difference? A man who was to become one of the premier American anthropologists, Julian Steward, thought that it does, that as a consequence the concepts used in biological ecology—ecosystem, succession, climax, and the like—are not meaningful in the study of Eskimo and other cultures. Admittedly, one could take any group of humans as biological creatures and examine their diseases, fertility, and genetic makeup; but none of that, Steward insisted, would further our understanding of how they organize themselves, whom they worship, or what they want for their children. Rather than treat humans, then, simply as though they are bears, he proposed a new approach, "cultural ecology," which would deal with the "superorganic factor of culture which . . . affects and is affected by the total web of life."[14] His most complete description of cultural ecology appears in *Theory of Cultural Change,* published in 1955. Steward had been at work in the ecology vineyard since the thirties, but with the publication of this widely influential book, he laid claim to being its foremost representative, and to being, as one admirer calls him, "the greatest of the synthesizers."[15]

Steward lifted the discussion of environmental influences far above the hoary notions of hot climates making hot-tempered, passionate lovers or a diet of rice producing the *Bhagavad-Gita.* His ecology was not a rigid climatic or geographical determinism. Nor did he try to explain every aspect of culture, but only those features that are a part of what he called the "cultural core—the constellation of features which are most clearly related to subsistence activities and economic activities."[16] The first step in his method was to examine the technology that a people develop to exploit their environment and produce their living—hunting weapons, water sources, agricultural practices, energy, transportation—and to discover how that technology is influenced by environmental circumstances. Their dialogue with the earth brings into play certain behavior patterns, especially work patterns. The second step of the Steward method was to analyze those patterns. In some cases, the exploitation of resources might require a large degree of work cooperation, in other cases none at all; in some situations large masses of workers have to be assembled and directed, elsewhere small groups organize themselves without coercion or authority. The third and final procedure in cultural ecology was to ask what effect work behavior patterns have on other domains of culture,

whether they be political systems, mythologies, or housing designs.[17] There might be only a modest impact on those other aspects, there might be a great deal, but we cannot know unless we ask the question.

Now here is where Steward's anthropology and Wittfogel's history came together. Steward believed that the critical issue was whether similar environments could be correlated with similar cultural cores, similar work behaviors, and similar survival techniques, which meant that cultural ecology must be comparative in its research. Irrigation furnished an ideal test case for that comparative strategy. In 1953 Steward organized a symposium on the archaic irrigation civilizations and included Karl Wittfogel on the program.[18] The intention was to find regularities in the seemingly unlimited diversity of human history. There was, it must be admitted, precious little agreement among the symposium participants as to what those regularities in irrigation were, though Steward and Wittfogel found their own ideas highly compatible. And once again the barebones arid landscape stimulated ecological thinking, just as it had led Malin and Webb, and has continued to lead scores of recent anthropologists, to wonder what hold nature has over the fate of human society.

By the 1950s the ecologists had carved out a secure niche for themselves in cultural anthropology. That achievement has poignant interest for the new environmental history, which is still struggling to be born, laying claim on its own profession to be recognized, and asking for employment. According to Robert Netting, cultural anthropology in the twentieth century has gone through three stages of research focus: first, the study of ideas and ideologies; second, the investigation of social structure and organization; and third, an interest in the ecological roots of cultures.[19] His point is not that ideas and institutions are no longer interesting to anthropologists; rather, it has become increasingly clear that there are basic environmental and technological forces shaping those phenomena and that we will get nowhere in understanding how cultures work if we blithely assume, for example, that a people's ideas simply come from other ideas. Historians, in contrast, have not as a group quite made it down to so basic a view. We are still up on the thirtieth floor, unsure of what goes on at ground level or what makes the elevators run.

Over the past two decades the ecological approach to anthropology has produced a distinguished corpus of monographs and theoretical treatises, which, taken together, have moved the field well beyond both Steward and Wittfogel. One can cite, among others, John Bennett's study of modern adaptation on the Canadian prairie, Harold Conklin's work on Philippine agriculture, Marshall Sahlin's effort to link Polynesian social stratification to land use, Richard Lee's analysis of the Kung Bushman's hunting

and gathering economy, and Clifford Geertz's detailed contrast of two Indonesian agro-ecosystems.[20] A common tendency in many of those works has been to erase the line that Steward tried to draw between biology and culture. Virtually no one disagrees with the point that humans are unique in the degree to which they make symbols, acquire values, invent beliefs and tools, and therefore that they are not so limited to inborn ways of satisfying their needs as other animals are. But it is a completely arbitrary act to put culture and nature into separate categories, requiring rigidly separate methods of analysis. The polar bear has claws and a fur coat to cope with its environment; we humans use our cultures to do the same. However distinct they may be ontologically, their function is not so very different. Hence anthropologists have come back to using terms like ecosystem, energy flow, and climax state to analyze the human condition. In the view of Andrew Vayda and Roy Rappaport, the ideal now is to achieve a single unified science of ecology in which students of cultural evolution and of bear predation can talk in the same language.[21]

With the spate of recent environmental disasters and with gathering anxiety over the impending collapse of industrial society, anthropologists have begun to deal more and more with the problem of how different peoples try to maintain themselves in balance (homeostasis) with their habitats. As important as it is to understand successful cases, it is also useful to examine the failures and discover what causes people to fail—inadequate food for a growing population, sudden hazards they did not anticipate, a stubborn blindness to reality, some altogether different reason—and what happens to them when they do. I will single out here the work of only two writing in this vein, though they are two of the most provocative: Roy Rappaport and Marvin Harris. The first likes the small-scale pictures—pigs and islands in the Pacific—as case studies in equilibrium. The second, on the other hand, takes the wide world as his province, reinterprets all of human history and prehistory, and describes the rise and fall of empires, civilizations, and our own "anticivilization." Their perspectives may be quite unlike at times, but both have something to say about contemporary human problems as well as about more primitive existence.

Rappaport's major contribution is to remind us that people are animals with ideas, and that those ideas are not inconsequential. He directs our attention to the formative role that rituals, ideologies, and cosmologies can play in directing our environmental arrangements; they can, among other things, serve a homeostatic end, adjusting population density and land use when they have intensified to dangerous levels, threatening to degrade irreversibly the habitat. This regulatory function

depends on how a people understand the world to function. In every culture, Rappaport points out, there is a "cognized model" of nature, which controls how humans behave in their environment. It may or may not correspond to the actual "operational model" of nature. But even where that cognized model is inaccurate by outside scientific standards, as in the case of the New Guinea tribesmen he has studied, it may all the same work wonderfully to restrain the exploitation of resources and keep the earth healthy and productive.

In our own industrial society, Rappaport goes on to say that cognized model, based as it is on a cornucopian vision of nature, is badly maladaptive. Despite our claims to superior factual knowledge and despite our self-confidence that we can manage the natural system skillfully, we do not really have an adequate method of checking ourselves—an effective set of, as he would say, "negative feedback mechanisms." He may be wrong; it can be argued that our recurrent conservation drives and fears of resource scarcity serve as regulatory rituals, keeping us from utterly devastating the globe, much as the New Guineans slaughter their pigs now and then in elaborate religious ceremonies to preserve their valleys. In any case, how people perceive and describe the earth and how they act on those ideas, Rappaport maintains, are not mere epiphenomena; they are powerful ecological components in themselves.[22]

It is Marvin Harris's opinion, however, that differences in how people in various cultures think and act towards nature are trivial and superficial. He finds a transcultural residuum in the human experience at all times and in all places. Briefly, that residuum is this: from the earliest hunters on the African savannah to the atomic era, humans have sought to discover the most rational, efficient way to feed themselves. Every culture, then, is at bottom simply another attempt to answer the eternal calorie problem—how to get the most nutrition out of a situation, what the best cost-benefit answer to the problem is. New cultures evolve, according to Harris, much as new biological species appear, when old answers to the nutrition challenge no longer work. There is in this Darwinian struggle for adaptation and survival no overall progress toward an ultimate, ideal solution, but there is a never-ending process of cycle and elaboration, a branching of the tree of cultural diversity into more and more directions. Old branches drop off the tree, as cultures exhaust their resources; new branches, new cultures, appear to exploit new possibilities. Industrial civilization is only the latest branch to sprout. For a while it was a remarkably effective solution to the recurring pressure to get enough to eat; it produced an unprecedented abundance. Now, however, it has become like

the dinosaurs of the Mesozoic, unable to adapt, highly vulnerable through over-specialization, the victim of its own success.[23]

The work of these two anthropologists, Rappaport and Harris, by no means exhausts the possibilities in ecological studies. Nor has their work escaped criticism. Both men have their detractors and refuters: in some cases, they are other ecologists who complain that the models on which Rappaport and Harris depend are outdated; or they are nonecologists who insist that there are better ways of talking about the making of cultures. The chief criticism of Rappaport's anthropology has been that he depends on a too static model of ecology, one that was prominent a few years back but has now been superseded by more dynamic, evolutionary paradigms. When Rappaport undertook his New Guinea studies, the reigning figure in the science was Eugene Odum, whose *Fundamentals of Ecology* (the first edition appeared in 1953, the third in 1971) described natural ecosystems in terms of physics: the quiet, orderly flow of energy through the food chain, life in timeless equilibrium, no struggle or imperfection or failure.[24] Rappaport followed suit, describing a tribal culture in perfect harmony with its habitat, using energy in the most efficient way possible. But, the critics ask, is Odum's really an adequate picture of nature—of its ragged opportunism, its trials and errors, its conflicts? And are human societies, even those living in unspoiled Stone Age isolation, truly so well adjusted to nature? Rappaport's sometime collaborator, Andrew Vayda, has acknowledged the justice of a few of the criticisms of their ecology. It ignored, he admits, evidence of system disruptions and unbalanced relations between people and their environments, and he recommends as better models a new generation of biology textbooks that portray a nature that is unfinished and flawed.[25]

However much truth there may be in those criticisms of Odum and Rappaport, one suspects a hidden agenda. A world full of accidents and misfits, a world that has never been in balance and never known harmony between humans and nature, is a scientific paradigm with many current political uses. It can serve to justify the destruction wrought by contemporary industrial societies: "that is the way history has always been." And it can obscure the unfavorable contrast that Rappaport presents between other "more primitive" people and ourselves. The fact that the textbooks have been rewritten, that there have been revisionists at work here as elsewhere, is no reason to assume that newer is better, that the earlier anthropology is now all wrong. The first rule in borrowing ideas and models from the natural sciences should be to beware of ideologies and fashions that call themselves "truth" and that dismiss yesterday's science as "false."

Ecology, to be sure, must deal with change as well as equilibrium, which means it must not only describe and explain cultures at any given moment in history but also must track the breakdown of adaptation and the process of evolution. In this respect Marvin Harris is a more useful guide than Rappaport. But Harris too has encountered some criticism, and it comes from every direction—from structuralists, sociobiologists, Marxists, idealists. Some maintain that he neglects the genetic basis of cultures. Others say, and I believe they are right, that he reduces complex behavior to an oversimplified, mechanical determinism, much as Malthus did with his food-population ratios.

One of the most telling criticisms, and it comes mainly from Marxists, is that Harris gives us once more the old functionalist creed that runs through much of Anglo-American social science. The functionalist finds rationality wherever he looks. For every institution, every technology, every war, every injustice, every social order, there is a good justification—in Harris's case, the maximization of food benefits over costs, the more efficient adaptation to and exploitation of the earth. But if all cultures are "functional," and all their ways have practical reasons behind them, then, ask some critics, what can be considered irrational, exploitative, or evil? The most outrageous and brutal treatment of one human being by another has a positive survival value, a communal utility, by the logic of functionalism. We can no more object to any society's arrangements than we can object to the teeth of a tiger or the shape of a leaf. But in fact one can draw a distinction between a carnivore's biology and a society's hierarchies and relations. What is missing from a functionalist ecology that blankets everything in sight is an awareness that throughout history some people have had more power than others to define what is rational in exploiting nature. The fact that a culture exists and endures is not proof that it works well for everyone in it—that its efficiency is defined in the interests of all. There is, say Marxist anthropologists, a continuing struggle going on between rival groups in any society as to who will define what is rational, what works, who gets fed and how much. Harris's functionalist explanations do not reflect that struggle and, therefore, distort the processes of change.[26]

There are, it must be said, similarities as well as differences between ecologists and Marxists in anthropology, and hence there are opportunities for a reconciliation. Throughout the development of the ecological school of analysis, from Clark Wissler to Marvin Harris, there has been a persistent bent toward a materialist interpretation of cultures. Even Rappaport, for all his effort to bring cognition and ideas back into the picture, would not insist that ideas can exist apart from or completely independent of the material substratum. In Harris's work, that bent has become militantly positivistic, much as it was in Marx's, and he calls his theory "cultural materialism," a deliberate echo of Marx's economic determinism.[27] The parallels between the two groups go farther. They are alike holistic in their approach to understanding human society; they agree there is more to the shaping of a society than meets the eye; they insist that history is made by people who are creatures of nature, through their work and their modes of production; they are both troubled by the conundrum of where imagination, free will, and consciousness fit into that materialist interpretation. But any reconciliation between the two groups must also come to terms with some profound contrasts in emphasis. They concern the weight anthropologists believe they ought to give forces like climate, population, disease, and biota versus the class struggle, the proletariat, and social relations of wealth and hegemony. And there is another difference: Marxism as a "scientific" theory has a long record now of failing to predict the actual course of events, while the ecologists have just begun to try.

What are those of us in history, especially in environmental history, to do with these examples of ecological anthropology before us? Simply, we must not ignore them or assume that they have nothing to offer the historical researcher. With their aid, it is now time to begin examining specific ways in which an ecological approach to history can be pursued, to ask what it can seek to do, what its limits are, and why its time at last has come.

First, let us be clear about one thing: there is no special new theory that ecological *history* can or should be expected to add to the anthropological models. To believe otherwise is to suppose that history is a self-contained discipline, with its own models of society and its own peculiar epistemology. It is not. History is more a clustering of interests than a discipline, and it has never had a unique, discrete paradigm to work with. As a matter of tradition and convenience, historians agree to deal with certain matters and to omit others. There is nothing odd or wrong about being selective in that way, of course, but the bias of selection ought not to be immune to dissent. For a long while historians tended to limit their purview to the nation-state, to its politics and its relations with other states, and to assume, rather too easily, that culture and ideas were contained therein. A consequence of that assumption was that the field often seemed to have only the vaguest notion of what a culture is and how it works. But that situation is changing rapidly, and as it does, there is less and less reason to insist on an isolated or sacrosanct discipline of "society á la history."

If historians per se have anything special to add to ecological analysis, it is the awareness that all generalizations must be rooted in specific times and places—not a small point when there are avid generalizers like Marvin Harris about. But that is not the same thing as claiming to operate by a peculiar set of theoretical principles and definitions.[28]

The majority of anthropologists, excepting the archaeologists, work among surviving tribal and village societies. Most historians, on the other hand, deal with the dead and their written records, though largely it is the dead of the modern era. These are differences, but they dwindle. Already among premodern historians, there is going on a rapprochement with anthropology; consider, for example, LeRoy Ladurie's *Montaillou: The Promised Land of Error,* in which ecological anthropology figures prominently.[29] It is mainly among modern historians in particular that the gap between the two fields of study remains to be bridged. Let us explore a few of the research areas in which that might be done.

The rise and evolution of industrialism and its close associate, capitalism, is by all odds the central issue confronting modern historians. What would constitute an ecological approach to that subject? In the first place, we would have to understand better than we do now the effect that population increases had on the collapse of feudal society and its techno-environmental base. William McNeill's splendid work on plagues and disease immunities provides some of the foundation for that inquiry.[30] The next step is to discover how increased population pressure on the soil created a demand, and an opportunity, for cultural innovation. At the center of this problem, in other words, is the postfeudal agricultural revolution. What was it? What pushed it along? What impact did it have on natural resources and social relations? As Frank Fraser Darling has put it, "The human ecologist will never neglect the belly of the people."[31] Indeed, that is where ecological history must always begin—with hunger and food, with filling people's bellies. The emergence of the new industrial economy rested on a fresh approach to that problem; it depended on modern agriculture, or factory farming, as it eventually came to be called. If Harris is right, every innovation, industrialism included, reaches at last a point of intensified development that threatens its own destruction. There are plenty of case studies in twentieth-century industrial and capitalist farming where that argument can be tested.[32] We need to understand, then, not only the ecological origins of this mode of production, but also its impact on the land—both on specific ecosystems and on the planet as a whole—and on the land's inhabitants.

A second set of modern experiences where an ecological perspective is called for has to do with that old, familiar theme, the frontier. It is a theme

as ancient as *Homo sapiens,* for people have been moving into unoccupied wilderness or invading someone else's territory since Lucy wandered across Ethiopia. And not only have humans been doing it: nothing links us more clearly to other creatures than pioneering. Over the past five hundred years that pioneering process has accelerated remarkably, until the world has become in effect a single country, dominated by a single aggressive species. As a consequence, thousands of plant and animal varieties have disappeared or are on the way into oblivion, millions of humans have died through wars and epidemics, and entire cultures have faded away. This is, as Alfred Crosby and others have demonstrated, a subject that demands, that cries out for, the integration of history and ecology.[33] What we still do not fully understand, despite our Turners and Webbs, is how and why some pioneering cultures succeed while others fail; or what makes one people adaptive and another conservative; or how some recent societies have achieved world dominance through expanding their ecological niche and thus, in the words of Marshall Sahlins, "have shown great capacity to wheel and deal in the face of local natural deficiencies."[34] Global conquest may be a political topic, and it most certainly is an ethical one. But at its roots it is also an ecological event.

I will give one further example of where ecology, anthropology, and modern history could work together: research into the regulation of exploitative behavior, or what Rappaport termed negative feedback mechanisms. Environmental history has already distinguished itself in this area, but there are issues that we have not yet resolved and others that we will never settle. In what ways, for instance, have our cognized models of nature been changed by the rise of an industrial, capitalist order? What contrast does that order make with preindustrial cultures and their regulatory mechanisms? Has the rising scale of social organization in modern times had an adverse influence on people's ability to perceive the limits of their environment and to restrain their demands within those limits? Have our religious and postreligious cosmologies, in contrast to those of animistic cultures, made us runaway successes, or have they undermined our future? Within the past century a number of new social rituals have appeared—the consumer ritual of Christmas is one of the more popular of them—but it is not altogether clear what their cumulative impact on nature has been, or whether in all that innovation there might also be, as hinted earlier, new rituals that have an environmentally conserving function.[35]

The ecological approach cannot alone address all the issues that historians today want addressed. It may, however, redirect their attention to some issues they have forgotten, or never been aware of. I am less ready

than Marvin Harris to believe that there is ever likely to be a transdisciplinary science of ecology that will give us, in whatever field we labor, a set of unchanging answers, coldly objective truths, or "laws" of behavior; there is too much of the historicist in me to credit that old positivistic promise. We will always be, I think, the children of our surroundings, unable to see the world through anyone's eyes but our own, always filled with biases, assumptions, passions, and commitments. It is not clear to me why we should want things otherwise. But if the ecological perspective will not make us more scientific, in Harris's sense, if it will not settle every puzzle in history, it may at least open our imaginations and let us look deeper into the past around us. We need that point of view for our continuing enlightenment. And it is now plain that the earth needs it too for its survival.