FROM COASTAL WILDERNESS TO FRUITED PLAIN

A History of Environmental Change in Temperate North America 1500 to the Present

GORDON G. WHITNEY

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Introduction

> Both history and ecology may be defined as the study of organisms in all their relations, living together, the differences between plant, animal, and human ecology or history being primarily a matter of emphasis.
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> J. C. Malin. 1950. 'Ecology and history.'

> Ecology becomes a more complex but far more interesting science when human aspirations are regarded as an integral part of the landscape.
>
> Rene Dubos. 1980. *The Wooing of Earth.*

Ecology has invariably been defined as the study of the organism and its environment. The reciprocal relationship of the organism and its environment is expressed in the ecological terms action and reaction. The influence or action of the environment on the organism and the effects or reaction of the organism on its environment constitute the focus of ecology (Weaver and Clements 1929). In the economy of nature, one organism looms well above the rest. That organism, needless to say, is *Homo sapiens.* As the noted ecologist Paul Sears (1956a) pointed out, man has always been and continues to be 'a part of the web of life and the living landscape.' Quite predictably, two of the more important themes in the history of western thought, (1) the influence of the environment on human culture and (2) man's modification of the earth's surface (Glacken 1967; Goudie 1981), are variants of the organism–environment or action–reaction concept.

The study of landscapes is a good beginning for the study of man's role in changing the face of the earth, because 'men must live on and off the land as the first condition of their survival' (Homans [1941] 1975, 12). Consequently the landscape reflects the technological innovations, the economic constraints,

and the cultural aspirations of its human inhabitants, all of which are superimposed upon its natural features. Like a palimpsest or a surface which has been written on many times after previous inscriptions have been partially erased, it represents a blend of the past and the present, of the human environment and the natural environment. The landscape is a historical document, a cumulative record of man's impact on the natural world (Nash 1970).

The study of landscapes is necessarily a synthetic discipline. Historians, geographers, and ecologists have all at times intentionally or unintentionally stepped within its bounds. Historians have traditionally emphasized the temporal dimensions of the landscape while geographers have commented upon its spatial relationships (Sauer 1938). All have stressed the advantages of a landscape level approach to their respective disciplines (Homans [1941] 1975; Forman and Godron 1986; Williams 1989).

Placing the appropriate emphasis on either side of the organism/environment or society/environment relationship has always been a difficult balancing act. Many historians and geographers initially stressed the degree to which the environment shaped human culture. At its worst, this form of investigation degenerated into a form of environmental determinism. Nature disciplined and shaped society to the point that history became a saga of accommodation to the environment. Notable examples of this school of thought include Frederick Jackson Turner's ([1893] 1961) analysis of the impact of the frontier on America's history and Walter Prescott Webb's (1931) study of technological adaptations to a grassland environment (White 1985).

The realization that society could also significantly alter its environment was relatively slow in coming. Most investigators credit George Perkins Marsh with the idea that man could gain a mastery over the natural world (Olwig 1980). As Marsh noted in a letter describing his seminal work *Man and Nature* 'whereas [others] think that the earth made man, man in fact made the earth' (Lowenthal 1953). Emphasis on the other side of the society/environment equation eventually culminated in today's 'cultural determinism' (Coones 1985; White 1985). Nature became a passive object, a *tabula rasa*, upon which society inscribed its larger goals. The natural landscape gave rise to the cultural landscape. It was humanized to the point it became a collection of artifacts - of houses, fences, and roads – reflecting society's values and material culture (Meinig 1979; Jackson 1984).

There are several dangers inherent in the strictly culturally oriented approach. First, it is inappropriate to lump all landscapes under the same heading. Eastern North America, for instance, contains a continuum of landscapes – ranging from the almost wholy humanized landscape of New York City to the natural or semi-natural landscape of the Adirondacks or the Boundary

Waters Canoe Wilderness Area. Second, human activities can never really be divorced from natural laws and processes (Coones 1985). Natural laws are operative in the more humanized environments. Frequently their action is exacerbated by human activities. Note the high incidence of soil erosion, flood control problems, and the cycling of toxic wastes in urban areas.

Both ecology, the study of the organism's environment or home, and economics, the management of the home, are derived from the same Greek work, 'oikos.' Unfortunately, for many, the similiarity often ends there. As the well-known ecologist Aldo Leopold once noted: 'One of the anomalies of modern ecology is that it is the creation of two groups, each of which seems barely aware of the existence of the other. The one studies the human community almost as if it were a separate entity, and calls its findings sociology, economics, and history. The other studies the plant and animal community, [and] comfortably relegates the hodge-podge of politics to "the liberal arts." The inevitable fusion of these two lines of thought will, perhaps, constitute the outstanding advance of the present century' (Meine 1988, 360). Some of the more recent studies of society/environment relationships highlight the advantages of analyzing natural processes within a cultural context. Stephen Pyne's (1982) history of the use of fire by various cultures in North America and Alfred Crosby, Jr.'s (1972, 1986) review of the exchange of pathogens between the New and the Old World are two of the more notable examples.

Historians and geographers have naturally tended to emphasize the human dimensions of the man-environment relationship (Malin 1950). The recognition that *Homo sapiens* is a major agent of environmental change is a basic tenet of the new field of environmental history (White 1985; Worster 1988). Nineteenth century historians typically extolled the advance of civilization across the American landscape. Humankind improved upon nature as wasteland was transformed into a garden. Contemporary historians have emphasized the more deleterious aspects of the settlement process (Rakestraw 1972). Many post-Earth Day, environmental histories have concentrated almost exclusively on the ecological degradation or the 'destructive exploitation' (Sauer 1938) of the New World's resources (e.g., Worster 1979; Merchant 1989). Where does the reality lie? Most human activities have beneficial as well as deleterious effects. Too great an emphasis on the negative aspects runs the risk of creating a relatively biased view of history. Deciding exactly what is beneficial or deleterious for a given ecosystem alone is a question which requires a great deal of scientific thought. From a more positive viewpoint, the rise of an ecologically oriented history has encouraged a greater awareness of ecological processes (e.g., Cronon 1983; Opie 1983). Historians discussing ecological issues are more likely to define their issues in a sound ecological

manner. This may involve offering 'some definition of what healthy ecosystems are and what constitutes their decline' (White 1985).

The great conservationist, Aldo Leopold ([1949] 1968, 205), once called for 'an ecological interpretation of history.' What is really needed, however, is an examination of history from the viewpoint of nature. America's plant and animal communities are as much a product of past events as they are an illustration of contemporary processes. The ecologist who overlooks the past is likely to misinterpret the present (Hamburg and Sanford 1986). European ecologists have made great strides in the field of historical ecology (Rackham 1980; Birks *et al.* 1988; Ellenberg 1988). Part of their success may be due to the fact that they never had the luxury of dealing with an environment unaffected by human activity. Seven thousand years of human history have left an indelible imprint upon the European landscape (Behre 1988). As a result, it is not surprising that the cultural landscape, the landscape formed by years of human activity, is a rather popular topic of research in Europe. Unfortunately American ecologists have been relatively slow to follow the lead of their European counterparts. There are a variety of factors responsible for their reticence. Part of it may be due to an attempt to simplify the complexities of the real world. Classical ecological thought in America has always emphasized the climatic or the edaphic control of the landscape. As the dean of America's plant ecologists, Frederic Clements (1936) once noted 'most ecological studies are carried out in settled regions where disturbance is the ruling process ... In all such instances it is exceedingly difficult or entirely impossible to strike a balance between stability and change, and it becomes imperative to turn to regions much less disturbed by man, where climatic control is still paramount.' Human activities have long represented an aberration which tends to obscure the more important plant/environment relationships. America's plant ecologists have traditionally shown a strong tendency to avoid such messy problems. They have preferred instead 'to study the plant and animal associations of mountaintops and jungles rather than those of dooryards and gardens, to think of plant and animal communities as they must have been in some blissfully innocent era before the advent of man' (Anderson 1956). Ecologists are still interested in minimizing mankind's disturbing influences (Christensen 1989), although they are less likely to do so under the rubric of climatic control.

The historian's reliance on anecdotal and often subjective materials has also discouraged many scientists' entry into the field of historical ecology. Ecology is increasingly a quantitative field of study. Few historical records meet the more rigorous ecologist's demand for quantification or statistically verifiable change. The uncontrolled nature of many 'historical experiments' also makes

it difficult to assign causality to a specific factor. The decline of a given species, for instance, may be related to climatic change or it may be due to human pressure or a combination of natural and anthropogenic causes (Brush 1986). Coincidence does not assure causality. Despite the above-mentioned caveats, reliance upon the historical approach has filled in many of the blanks in the scientific record and in the process created a greater awareness of both the rate and the extent of environmental change (Catchpole and Moodie 1978; Hooke and Kain 1982). The recent upsurge of interest in long-term ecological research has only highlighted the value of good historical records extending back over the last 10–300 years.

Over 100 years ago, George Perkins Marsh ([1864] 1965, 13) stated in his pioneering work, *Man and Nature*, '[the reaction of man on nature] has not ... so far as I know, been made [a] matter of special observation, or of historical research by any scientific inquirer.' Marsh's ([1864] 1965, 14–15) contention that there had been little systematic observation on the subject, that the existing data were scattered, and that many of the ideas put forward were largely a matter of speculation is still true today (Williams 1989).

The present study represents an attempt to scientifically assess the character and the extent of the changes occasioned by European colonization of a segment of the North American landscape. By focusing on both the living, e.g., biotic, and the nonliving, e.g., abiotic, features of the landscape, it endeavors to create an integrated picture of the land use history of the northeastern and the midwestern portions of the United States. Man's role as a geomorphological agent of change is emphasized as well as his impact upon the fauna and the flora of the area. Since one's use of the environment is often conditioned by one's perception of the land, the role of the environment in the formation of America's land use patterns is also explored.

From the standpoint of man's interaction with the land, a study of the northeastern quarter of the United States from 1500 to the present offers several distinct advantages. Climatically and culturally the area is a relatively homogeneous entity. A humid to subhumid climate characterizes most of the area (Hunt 1974; Trewartha and Horn 1980). Many of the soils were amenable to the small grain and cattle farming tradition imported from northwestern Europe in the early 1600s (Carrier 1923; Sauer [1976] 1981).

For the Northeast and the Midwest, the time span from 1500 to the present was a period of very rapid and far-reaching change. As the eighteenth century French-born 'American farmer', Crèvecoeur (1925, 141) noted, the Americans had 'done the most in the least time of any people.' Forest clearance, a process which took centuries in western Europe (Darby 1956; Glacken 1967, 290), was condensed to decades in America. The conversion of 'an

immense wilderness into a fruited plain' (Dwight [1822] 1969, 4:365) was a unique experience which few of the more discerning observers overlooked. Alexis de Tocqueville ([1835] 1966, 1:291), the French visitor, inquired 'in what part of human history can be found anything similar to what is passing before our eyes in North America?' To the more romantically inclined, it was the collision of a primeval, untouched land with an advanced civilization (Tocqueville [1835] 1966, 1:291), 'a struggle between civilized man and barbarous, uncultivated nature' (Marsh [1848] 1973), in which 'all the resources of European mechanical invention were brought to bear against nature' (Sears [1935] 1959, 66).

Few areas on the earth's surface have experienced as extensive and dramatic a change in their fauna and flora as the mid-latitude forests and grasslands of eastern North America (Haggett 1979, 229–230; Klopatek *et al.* 1979). One English emigrant (Collins [1830] 1971, 35) conveniently summarized the changes as follows: 'the wild animals, in many places, have almost disappeared; and thousands of square miles of prairie, abounding with all kinds of indigenous plants, have been exchanged for cultivated fields.' The later shift from an agrarian society to an industralized, urban-based society in the nineteenth and twentieth centuries only compounded the earlier modifications.

Many of the changes coincided with an increased interest in the sciences and an awareness of man's ability to alter the environment (Glacken 1967, 471–497). The New World represented a vast natural laboratory for testing the prevalent European theories on man's modification of the earth's surface. The effects of clearing, drainage, cropping practices, etc., on the climate, the fertility of the soil, and the health of the inhabitants were only a few of the questions that concerned many of Europe's statesmen and scientists (Chinard 1945; Glacken 1967, 358, 685). Fortunately, for our purposes, the rapid advance of science in the eighteenth and nineteenth centuries made it possible to quantify and document many of the changes. In the eighteenth century, for instance, Linneaus' binomial system of nomenclature replaced the more cumbersome polynomial system of nomenclature. America's flora and fauna could be described on a more scientific basis (Benson 1979). The increased use of thermometers and other scientific instruments (Kincer 1933; Brown 1943; Chinard 1945) also provided a better measure of the change. Naturalists were closer to converting their armchair speculation into hard facts.

If European colonization placed an indelible mark on North America's landscape, the encounter with the New World also altered the colonists' perception of nature. Europe's Romantics may have been the first individuals to extoll the virtues of a wilderness environment. It was the more pragmatically minded Americans, however, who set aside large areas of their landscape in

the form of parks and forests for the preservation of nature (Nash 1973; Runte 1979; Faegri 1988). Perhaps as Roderick Nash (1970) and others have implied there is a connection 'between where men live and what they think.' The ensuing chapters provide a more detailed exploration of the reciprocal relationship of society and the New World's resources – of the human activities which generated the cultural landscape and the environment which in turn shaped America's perception and use of the land.