

BOOK #45

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# AMERICAN POLITICAL THOUGHT

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✓ *Third Edition*

Kenneth M. Dolbeare

THE EVERGREEN STATE COLLEGE

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AMERICAN POLITICAL THOUGHT  
Third Edition

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"DECLINE"

n must be measured. icking has a rich history. It is and growing. Pope Paul VI all Christian communities onsibility "to analyze with ob- situation which is proper to ntry, to shed on it the light of unalterable words and to les of reflection, norms of d directives for action from ching of the Church." There- on the past work of our own erence, including the 1919 Social Reconstruction and l letters. In addition many he Catholic, Protestant, and unities, in academic, busi- cal life, and from many dif- ic backgrounds have also ance. We want to make the stian social thought a living, rce that can inspire hope and e future. e, then, first of all to provide members of our own Church to form their consciences c matters. No one may claim istian and be comfortable in hunger, homelessness, inse- ustice found in this country . At the same time, we want ce to the public debate about in which the U.S. economy ing. We seek the cooperation f those who do not share our on.

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### CAROLYN MERCHANT

Carolyn Merchant (b. 1936) is a leading scholar and ecofeminist whose current appointment is as professor of environmental history, philosophy, and ethics at the University of California, Berkeley. She earned her Ph.D. at the University of Wisconsin in 1967. Her scholarly work has brought together the fields of the history of science, gender studies, and ecology, in particular showing how the epistemological basis of "science" and the social ideology of male dominance are mutually supporting. In *The Death of Nature: Women, Ecology, and the Scientific Revolution* (1980), she shows that concepts of nature have always been female and that the task of (male) science is to find ways to dominate and exploit nature-as-female. In many ways, she is re-writing the environmental understanding of the early (Progressive era) conservation movement.

The excerpt here is from two chapters of Merchant's *Ecological Revolutions: Nature, Gender, and Science in New England* (1989), in which she develops a provocative theory of the succession of ecological revolutions that change human relationships to nature and the social relations that people have with one another. She sees economics, power structures, dominant worldviews, and gender relations as an integrated whole—changing together in linkage with ecological changes. She argues that an ecological revolution is under way in the 1990s, such that the nature of the American economy and social relations in the United States—and between the United States and the world—are entering a period of fundamental change.

#### *Ecological Revolutions* (1989)

##### 1. ECOLOGY AND HISTORY

Wherever [man] plants his foot, the harmonies of nature are turned to discords. . . . Indigenous vegetable and animal species are extirpated and supplanted by others of foreign origin . . . with new and reluctant growth of vegetable forms, and with alien

tribes of animals. These intentional changes and substitutions constitute indeed great revolutions.—George Perkins Marsh, *Man and Nature*, 1864

When Vermont statesman and author George Perkins Marsh took up his pen to write to botanist Asa Gray in 1849, he re-



vealed the concerns that would spark his quest to understand the destruction of New England in a historical context. "I spent my early life almost literally in the woods. A large portion of the territory of Vermont was, within my recollection, covered with the natural forest. . . . Having been personally engaged to a considerable extent," he confessed, "in clearing lands, and manufacturing, and dealing in lumber, I have had occasion both to observe and to feel the effects resulting from an injudicious system of managing woodlands and the products of the forest." The changes that Marsh observed and documented in *Man and Nature* were the culmination of a history of European interactions with the land. They were reflected only belatedly in the New World.

New England is a mirror on the world. Changes in its ecology and society over its first 250 years were rapid and revolutionary. Only through a historical approach can the magnitude and implications of such changes for the human future be fully appreciated. What took place in 2,500 years of European development through social evolution came to New England in a tenth of that time through revolution. This book delineates the characteristics of ecological revolution—colonial and capitalist—through the study of the New England exemplar. Yet the implications extend far beyond the confines of New England. As the American frontier moved west, similar ecological revolutions followed each other in increasingly telescoped periods of time. Moreover, as Europeans settled other temperate countries through-

out the world, colonial ecological revolutions took place.

Today, capitalist ecological revolutions are occurring in many developing countries in a tenth of New England's transformation time. In the epilogue, it is suggested that human beings are now entering a third type of revolution—a global ecological revolution—that encompasses the entire earth.

Between 1600 and 1860 two major transformations in New England land and life took place. The first, a colonial ecological revolution, occurred during the seventeenth century and was externally generated. It resulted in the collapse of indigenous Indian ecologies and the incorporation of a European ecological complex of animals, plants, pathogens, and people. The colonial revolution extracted native species from their ecological contexts and shipped them overseas as commodities. It was legitimated by a set of symbols that placed cultured European humans above wild nature, other animals, and "beastlike savages." It substituted a visual for an oral consciousness and an image of nature as female and subservient to a transcendent male God for the Indians' animistic fabric of symbolic exchanges between people and nature.

The second transformation, a capitalist ecological revolution, took place roughly between the American Revolution and about 1860. It was initiated by internal tensions within New England and by a dynamic market economy. Local factories imported natural resources and exported finished products. Air pollution, water pollution, and resource depletions were created as externalities outside the calculation of profits. The capitalist revolution demanded an economy of increased human labor, land management, and a legitimating mechanistic science. It split human consciousness into a disembodied analytic mind and a romantic emotional sensibility.

Each of these "ecological revolutions" altered the local ecology, human consciousness. New machines and technologies—machines, fences, clocks, and chemicals—imposed on nature. The relations between men and women through which was maintained and reproduced socially changed. And in turn the consciousness—perceiving, and analyzing—through which socially constructed and interpreted natural environment were reorganized.

My thesis is that ecological revolutions are major transformations in relations with nonhuman nature from changes, tensions, and conflicts that develop between a social production and its ecology, and modes of production and distribution. These dynamics in turn support the emergence of new forms of consciousness, images, and worldviews. The colonial and capitalist ecological revolutions in New England may be understood through a description of each ecology, production, reproduction, consciousness; the processes broke down; and an analysis of relations between the emerging capitalist society and nonhuman nature.

Two frameworks of analysis are proposed for discussing the social ecological revolutions. In *The Scientific Revolutions* (1962) Kuhn approached major transformations in scientific consciousness from a perspective internal to the workings of the community of scientists. Paradigms are structures of thought groups of scientists within which are solved. When a sufficient number of anomalies challenges a paradigm, scientists construct new paradigms, initiating scientific revolutions. The social revolution in the sixteenth century, the Newtonian revolution in the

Source: Reprinted from Carolyn Merchant, *Ecological Revolutions: Nature, Gender, and Science in New England*. Copyright © 1989 by the University of North Carolina Press. Reprinted by permission of the author and publisher.

world, colonial ecological revolution.

Capitalist ecological revolutions in many developing countries of New England's transformation in the epilogue, it is suggested that beings are now entering a revolution—a global ecological—that encompasses the en-

1600 and 1860 two major transformations in New England land and life. The first, a colonial ecological revolution occurred during the seventeenth century and was externally generated in the collapse of indigenous ecologies and the incorporation of European ecological complex of plants, pathogens, and people. A social revolution extracted native peoples from their ecological contexts and sent them overseas as commodities. It was mediated by a set of symbols that placed European humans above plants, other animals, and "beastlike" beings; substituted a visual for an oral tradition; and an image of nature as subordinate to a transcendent God for the Indians' animistic fabric of exchanges between people and

land and transformation, a capitalist revolution, took place roughly between the American Revolution and 1860. It was initiated by internal forces within New England and by a market economy. Local factories used natural resources and exported products. Air pollution, water pollution, and resource depletions were externalities outside the calculations. The capitalist revolution created an economy of increased human labor management, and a legitimizing scientific science. It split human nature into a disembodied analytic and a romantic emotional sensibility.

Each of these "ecological revolutions" altered the local ecology, human society, and human consciousness. New material structures and technologies—maps, plows, fences, clocks, and chemicals—were imposed on nature. The relations between men and women through which daily life was maintained and reproduced were radically changed. And in turn the forms of consciousness—perceiving, symbolizing, and analyzing—through which humans socially constructed and interpreted the natural environment were reorganized.

My thesis is that ecological revolutions are major transformations in human relations with nonhuman nature. They arise from changes, tensions, and contradictions that develop between a society's mode of production and its ecology, and between its modes of production and reproduction. These dynamics in turn support the acceptance of new forms of consciousness, ideas, images, and worldviews. The course of the colonial and capitalist ecological revolutions in New England may be understood through a description of each society's ecology, production, reproduction, and forms of consciousness; the processes by which they broke down; and an analysis of the new relations between the emergent colonial or capitalist society and nonhuman nature.

Two frameworks of analysis offer springboards for discussing the structure of such ecological revolutions. In *The Structure of Scientific Revolutions* (1962), Thomas Kuhn approached major transformations in scientific consciousness from a perspective internal to the workings of science and the community of scientists. Scientific paradigms are structures of thought shared by groups of scientists within which problems are solved. When a sufficient number of anomalies challenges a scientific theory, scientists construct new paradigms, initiating scientific revolutions. The Copernican revolution in the sixteenth century, the Newtonian revolution in the seventeenth,

Lavoisier's chemical revolution in the eighteenth, Darwin's evolutionary theory in the nineteenth, and Einstein's relativity theory in the twentieth are examples of major transformations within various branches of science.

One of the strengths of Kuhn's provocative account is its recognition of stable worldviews in science that exist over relatively long periods of time, but that are rapidly transformed during periods of crisis and stress. One of its limitations is its failure to incorporate an interpretation of social forces external to the daily activities of scientific practitioners in their laboratories and field stations. Internal developments in scientific theories are affected, at least indirectly, by social and economic circumstances. A viewpoint that incorporates social, economic, and ecological changes is required for a more complete understanding of scientific change.

A second approach to revolutionary transformations is that of Karl Marx and Friedrich Engels. Their base/superstructure theory of history viewed social revolutions as beginning in the economic base of a particular social formation and resulting in a fairly rapid transformation to the legal, political, and ideological superstructure. In the most succinct statement of his theory of history, in 1859, Marx wrote: "At a certain stage of their development, the material productive forces of society come in conflict with the existing relations of production. . . . Then begins an epoch of social revolution. With the change of the economic foundation the entire immense superstructure is more or less rapidly transformed."

For Marx, society is an integrated whole. A fabric of economic, political, and intellectual forces exists and evolves as a stable system for periods of time. But at particular times in history, changes are initiated in economic production that bring about

rapid transformations in politics and consciousness. One weakness of this approach is in the determinism assigned to the economic base and the sharp demarcation between base and superstructure. But its strength lies in its view of society and change. If a society at a given time can be understood as a mutually supportive structure of dynamically interacting parts, then the process of its breakdown and transformation to a new whole can be described. Both Kuhn's theory of scientific revolution and Marx's theory of social revolution are starting points for a theory of ecological revolutions.

Science and history are both social constructions. Science is an ongoing negotiation with nonhuman nature for what counts as reality. Scientists socially construct nature, representing it differently in different historical epochs. These social constructions change during scientific revolutions. Similarly, historians socially construct the past in accordance with concepts relevant to the historian's present. History is thus an ongoing negotiation between the historian and the sources for what counts as history. Ecology is a particular twentieth-century construction of nature relevant to the concerns of environmental historians.

A scientific worldview answers three key questions:

1. What is the world made of? (the ontological question)
2. How does change occur? (the historical question)
3. How do we know? (the epistemological question)

Worldviews such as animism, Aristotelianism, mechanism, and quantum field theory construct answers to these fundamental questions differently.

Environmental history poses similar questions:

1. What concepts describe the world?
2. What is the process by which change occurs?
3. How does a society know the natural world?

The concepts most useful for this approach to environmental history are ecology, production, reproduction, and consciousness. The relations among animals (including humans), plants, minerals, and climatic forces constitute the ecological core of a particular habitat at a particular historical time. Through production (or the extraction, processing, and exchange of resources for subsistence or profit), human actions have their most direct and immediate impact on nonhuman nature. Human reproduction, both biological and social, is one step removed from immediate impact on nature: the effects of the biological reproduction of human beings are mediated through a particular form of production (hunting-gathering, subsistence agriculture, industrial capitalism, and so on). Population does not press on the land and its resources directly, but on the mode of production. Two steps removed from immediate impact on the habitat are the modes through which a society knows and explains the natural world—science, religion, and myths. Ideas must be translated into social and economic actions in order to affect the nonhuman world. . . .

How do reproduction and production interact? According to Engels in his *Origin of the Family, Private Property, and the State* (1884), "the determining factor in history is, in the last resort, the production and reproduction of immediate life . . . this itself is of a twofold character. On the one hand, the production of the means of subsistence . . . on the other, the production of human beings themselves." The reproduction of human beings is thus distinct from, but structurally related to, the production of the means of subsistence. A change in the

mode of production from gathering to subsistence-oriented agriculture, will increase the land to feed people. Intensive agricultural production is made possible through advances in science and technology.

Production and reproduction are altered, as in population changes in property inheritance is affected. Conversely, when changes, as in the addition or deletion of resources or in technological innovation, alter reproduction and biological reproduction. A dramatic change at either reproduction or production alters the dynamic between them, resulting in a major transformation of the system. Whereas the colonial ecological revolution in New England resulted from the effects wrought by European production and reproduction, the ecological revolution was initiated by tensions between production and reproduction. Because of the low person-land ratio, each family had to produce its own labor force in order to produce subsistence for the far other hand, a partible system of inheritance meant that families increased over three or four generations to the point that not all sons had enough land to reproduce the system. The tensions between production and reproduction of subsistence-oriented agriculture (a large family labor force) and reproduction through partible inheritance (all sons must inherit farms) led to a wage labor supply of 1 million needed for the transition to capitalist culture.

Socialist-feminists have articulated the interaction between production and reproduction. In her 1976 *Dialectics of Production and*

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mode of production from gathering-hunt-  
ing to subsistence-oriented agriculture, or  
from subsistence agriculture to capitalist  
agriculture, will increase the capacity of  
the land to feed people. Intensification in  
agricultural production is made possible  
through advances in science and technol-  
ogy.

Production and reproduction interact  
dialectically. When reproductive patterns  
are altered, as in population growth or  
changes in property inheritance, production  
is affected. Conversely, when production  
changes, as in the addition or depletion of re-  
sources or in technological innovation, social  
reproduction and biological reproduction are  
altered. A dramatic change at the level of ei-  
ther reproduction or production can alter  
the dynamic between them, resulting in a  
major transformation of the social whole.  
Whereas the colonial-ecological revolution  
in New England resulted from external im-  
pacts wrought by Europeans on Indian  
production and reproduction, the capitalist  
ecological revolution was initiated by inter-  
nal tensions between production and re-  
production. Because of the colonists' low  
person-land ratio, each family had to re-  
produce its own labor force in order to pro-  
duce subsistence for the family. On the  
other hand, a partible system of patriar-  
chal inheritance meant that farm sizes de-  
creased over three or four generations to  
the point that not all sons could inherit  
enough land to reproduce the subsistence  
system. The tensions between the require-  
ments of subsistence-oriented production  
(a large family labor force) and social re-  
production through partible inheritance  
(all sons must inherit farms) helped to cre-  
ate a wage labor supply of landless sons  
needed for the transition to capitalist agri-  
culture.

Socialist-feminists have further elabo-  
rated the interaction between production  
and reproduction. In her 1976 article, "The  
Dialectics of Production and Reproduction

in History," Renaté Bridenthal argues that  
changes in production give rise to changes  
in reproduction, creating tensions between  
them. For example, the change from a  
preindustrial agrarian to an industrial  
capitalist economy that characterized the  
capitalist ecological revolution can be de-  
scribed with respect to tensions, contradic-  
tions, and synthesis within the gender  
roles associated with production and repro-  
duction. In the agrarian economy of colo-  
nial America, production and reproduction  
were symbiotic; women participated in  
both spheres, since the production and re-  
production of daily life were centered in  
the household and domestic communities.  
Likewise, children were socialized into pro-  
duction by men working in barns and  
fields and by women working in farm  
yards and farmhouses. But with industri-  
alization, production of items such as tex-  
tiles and shoes moved out of the home into  
the factory; while farms themselves be-  
came specialized and mechanized. Unmar-  
ried women were employed outside the  
home in textile production, or later in cleri-  
cal work, while married women focused  
more of their efforts on the reproduction of  
daily life through housework. Production  
became more public, reproduction more  
private, leading to their social and struc-  
tural separation. For working-class women,  
the split between production and reproduc-  
tion imposed a double burden of wage la-  
bor and housework, while for middle-class  
women it led to an increase in domesticity  
and indoor housework.

Ecological revolutions are generated  
through tensions and interactions between  
production and ecology and between pro-  
duction and reproduction. Changes may be  
externally stimulated as in the colonial ec-  
ological revolution or internally stimulated  
(and aided by external market incentives)  
as in the capitalist ecological revolution.  
As society responds to change, inherent  
tensions in its legitimating worldview and

forms of consciousness begin to widen. Some assumptions about nature are elaborated and developed to support and lead the new directions; others are rejected as irrelevant and become the ideas of subordinate groups.

### *Consciousness*

Consciousness is the totality of one's thoughts, feelings, and impressions, the awareness of one's acts and volitions. Group consciousness is a collective awareness by an aggregate of individuals. Individual consciousness and group consciousness are shaped by both environment and culture. In different historical epochs, a society's consciousness is dominated by particular characteristics. These forms of consciousness, thorough which the world is perceived, understood, and interpreted, are socially constructed and subject to change.

A society's symbols and images of nature express its collective consciousness. They appear in mythology, cosmology, science, religion, philosophy, language, and art. Scientific, philosophical, and literary texts are sources of the ideas and images used by controlling elites, while rituals, festivals, songs, and myths provide clues to the consciousness of ordinary people. How are the ideas, images, and metaphors that legitimate human behaviors toward nature translated into ethics, morals, and taboos? Anthropologist Clifford Geertz holds that religious beliefs establish powerful moods and motivations that translate into social behaviors. Also, ideological frameworks or worldviews "secrete" behavioral norms. According to Charles Taylor, particular frameworks give rise to a certain range of normative variations and not others because their related values are not accidental. When sufficiently powerful, worldviews and their associated values can override social changes, but if weak or weakened they can be undermined. A tribe of

New England Indians or a community of colonial Americans may have a religious worldview that holds it together for many decades while its economy is gradually changing. Eventually, however, with the acceleration of commercial change, ideas that had formerly existed on the periphery or among selected elites may become dominant if they support and legitimate the new economic directions.

For Native American cultures, consciousness was an integration of all the senses with the body in sustaining life. In this mimetic consciousness, culture was transmitted intergenerationally through imitation in song, myth, dance, sport, gathering, hunting, and planting. Oral-aural transmission of tribal knowledge through myth and transactions between animals, Indians, and neighboring tribes produced sustainable relations between the human and the nonhuman worlds. The primal gaze of locking eyes between hunter and hunted initiated the moment of ordained killing when the animal gave itself up so that the Indian could survive. The very meaning of the gaze stems from the intent look of expectancy when a deer first sees a fire, smells a scent, or looks into the eyes of a pursuing hunter. For Indians engaged in an intimate survival relationship with nature, sight, smell, sound, taste, and touch were all of equal importance, integrated together in a total participatory consciousness.

When Europeans took over Native American habitats during the colonial ecological revolution, vision became dominant within the mimetic fabric. Although daily life for most colonial settlers, as for Indians, was still guided by imitative, oral, face-to-face transactions, Puritan eyes turned upward toward a transcendent God who sent down his Word in written form in the Bible. Individual Protestants learned to read so that they could interpret God's word for themselves. In turn, the biblical

word legitimated the imposition of culture and artifact in the new colonial gaze of the Indian was subject to the objectifying scrutiny of fur trader, merchant, and banker who viewed nature as resource and commodity and property relations that excluded Indians were codified in alphabetic literacy became religious expression, social survival, and motility.

The imposition of a visual consciousness by Puritans was to the continuance of Indian ways of life. The implications led to the loss of mimetic consciousness. Plato's Greece. According to Eric Havelock, Plato's critique of mimetic heritage of Homer was a warning. The orator to Plato (as the Puritan) was an imitator in extremes extending even to cries of animals. The oral was not the creative, individual appropriate to the virtuous distortive chicanery of the represented appearance as reality. Poetry stood for the illusion of appearance, not the truths discernible. The oral tradition was merely repeated, remembered examples determined human responses. Who repeated by rote memory song, poem, or myth was not a person with a unique psyche, but a vessel. No "I" stood apart from consciousness to examine or spell. No "self" asserted its independence and authority. For Plato, the separation of the autonomous psyche from the known, the subject from the object analytical from the oral.

Against poetry, Plato set forth pure forms, with mathematical exemplar par excellence of knowledge ideal forms of the triangle, the

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word legitimated the imposition of agricul- ture and artifact in the new land. The pri- mal gaze of the Indian was submerged by the objectifying scrutiny of fur trader, lum- ber merchant, and banker who viewed na- ture as resource and commodity. Treaties and property relations that extracted land from Indians were codified in writing. Al- phanumeric literacy became central to reli- gious expression, social survival, and up- ward motility.

The imposition of a visually oriented consciousness by Puritans was shattering to the continuance of Indian animism and ways of life. The implications were similar to the loss of mimetic consciousness in Plato's Greece. According to philosopher Eric Havelock, Plato's critique of the oral mimetic heritage of Homer was devastat- ing. The orator to Plato (as the shaman to the Puritan) was an imitator who indulged in extremes extending even to the howls and cries of animals. The oral tradition was not the creative, individualistic me- dium appropriate to the virtuous, but the distortive chicanery of the trickster who presented appearance as reality. Myth and poetry stood for the illusions of appear- ance, not the truths discernible to reason. The oral tradition was merely a catalog of repeated, remembered examples that pre- determined human responses. The person who repeated by rote memory through song, poem, or myth was not an individual with a unique psyche, but a victim of hyp- nosis. No "I" stood apart from the collective consciousness to examine or criticize its spell. No "self" asserted its own indepen- dence and authority. For Plato, the emer- gence of the autonomous psyche signified the separation of the knower from the known, the subject from the object, and the analytical from the oral.

Against poetry, Plato set his theory of pure forms, with mathematics as the ex- emplar par excellence of knowledge. The ideal forms of the triangle, the bed, and

the good were exact, unchanging, and uni- versal. The applied mathematician, the carpenter, and the philosopher attempted to copy these forms in matter, while the or- ator and the poet were content with word pictures. Mathematics, logic, and science, or *episteme*, were the true modes of know- ing, and the self was the knowing subject. With the commercialization of the fur trade and the missionary efforts of Jesuits and Puritans, a society in which animals, plants, and rocks were equal subjects changed to one dominated by transcendent vision in which individual human subjects were separate from resource objects. This change in consciousness imposed by domi- nant elites characterized the colonial eco- logical revolution.

The rise of an analytic, quantitative con- sciousness was a feature of the capitalist ecological revolution. Capitalist ecological relations emphasized efficient manage- ment and control of nature. With the de- velopment of mechanistic science and its use of perspective diagrams, visualization was integrated with numbering. The print- ing press and perspective art linked the mental to the material through what soci- ologist of science Bruno Latour called "immutable mobiles." By reducing three- dimensional natural objects—oceans, rivers, beaver, birds, rocks, and ores—to two-dimensional inscriptions—maps, charts, drawings, diagrams, lists, graphs, curves, equations, papers, texts, files, and archives—quantitative features could be circulated unchanged. In a laboratory, observatory, or field station, they could be accumulated, arrayed, superimposed, compared, and re- constructed as a "natural" order. "The re- sult," observed Latour, "is that we can work on paper with rulers and numbers, but still manipulate three-dimensional ob- jects 'out there'.... Distant or foreign places and times [can] be gathered in one place in a form that allows all the places and times to be presented at once." The

visual and material thus combined to produce power over nature through science. The capitalist ecological revolution was characterized by the superposition of scientific, quantitative approaches to nature and its resources. Through education analytic consciousness expanded beyond that of dominant elites to include most ordinary New Englanders.

Forms of consciousness are power structures. When one worldview is challenged and replaced by another during a scientific or ecological revolution, power over society, nature, and space is at stake. Symbol systems, metaphors, and images express the implicit ethics of elites in positions of social power. Debates over scientific theories, argues historian of science Donna Haraway, are contests for power over the terms of discourse. According to French philosopher Michel Foucault, the history of power over nature is a history of spaces, spatial metaphors (habitat, soil, landscape, topography, terrain, region, and so on), strategies of control, and modes of mapping, tabulation, recordation, classification, demarcation, and ordering. Whereas space "used to belong to nature," when mapped by explorers and geographers, cataloged and inventoried by traders and naturalists, and coded by militarists and computer scientists, it can be controlled by an "eye of power" and subjected to unlimited surveillance. For Foucault, the vision obtained metaphorically through Jeremy Bentham's Panopticon, in which the radiating wings of an entire prison can be surveyed from a single central tower, is paradigmatic of the controlling scrutiny of the overseer. All things are made visible through the dominating, examining look of a cultural overseer located in a management center that controls not only social institutions, but also by extension nature, resources, national parks, wild rivers, endangered whales, herds of wild antelope, migrating warblers, and indeed the whole

earth itself through satellite surveillance.

Human consciousness socially constructs nature in different ways in different historical epochs and cultures. Humans negotiate "reality" with nonhuman nature. Indians constructed nature as a society of equal face-to-face subjects. Animals, plants, and rocks were alive and could be communicated with directly. For eighteenth-century New England farmers, nature was an animate mother carrying out God's dictates in the mundane world. Plants and even rocks grew on the earth's surface, but were created for human use and could be harvested as commodities. Nineteenth-century scientists, industrialists, and market farmers reconstructed them as scientific objects to be analyzed in the laboratory and as natural resources to be extracted for profit.

Ecological thinking constructs nature as an active partner. The "nature" that science claims to represent is active, unstable, and constantly changing. As parts of the whole, humans have the power to alter the networks in which they are embedded. Nature as active partner acquiesces to human interventions through resilience and adaptation or "resists" human actions through mutation and evolution. Nonhuman nature is an actor; human and nonhuman interactions constitute the drama. Viewed as a social construction, nature as it was conceptualized in each social epoch (Indian, colonial, and capitalist) is not some ultimate truth that was gradually discovered through the scientific processes of observation, experiment, and mathematics. Rather, it was a relative changing structure of human representations of "reality."

Ecological revolutions, I argue, are processes through which different societies change their relationship to nature. They arise from tensions between production and ecology and between production and reproduction. The results are new con-

structions of nature, both made visible in human consciousness. . . .

## 10. EPILOGUE: THE GLOBAL ECOLOGICAL REVOLUTION

Twentieth-century New England is a product of the colonial and capitalist revolutions. Its Native American communities have been reduced to small but resilient communities that have adapted to modern culture while retaining many traditional practices. The region is deeply embedded in the interconnected modern world by capitalist forms of production, and consciousness. As a part of a global ecological network, it is the availability and scarcity of resources. It is an integral part of the modern capitalist core economies and peripheral Third World economies on resources and cheap labor.

Most of the energy, food, and raw materials needed to sustain the lives of New Englanders come from external sources. Roughly 80 percent of its meat and fruit are imported from other regions. The availability and the cost of these resources are affected by transportation, midwestern droughts. Energy imported oil and gas, augmenting burning stoves and some local nuclear energy. Energy availability is subject to global shortages and price fluctuations. Clothing is largely imported from southern and foreign textile mills where wage labor is cheaper and supported by local and cottage clothing industries. In the country as a whole, fast food is prepared from imported beef and pork. Central and South America at the source of tropical rain forests and service of foam containers at the expense of the global ozone layer.

This dependence on outside resources has moved some types of environmental degradation beyond New England's



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Twentieth-century New England is a prod- uct of the colonial and capitalist ecological revolutions. Its Native Americans have been reduced to small but resilient commu- nities that have adapted to mainstream culture while retaining many tribal tradi- tions. The region is deeply embedded in an interconnected modern world structured by capitalist forms of production, reproduc- tion, and consciousness. As a member of a global ecological network, it is affected by the availability and scarcity of natural re- sources. It is an integral part of the West- ern capitalist core economies that depend on peripheral Third World economies for resources and cheap labor.

Most of the energy, food, and clothing needed to sustain the lives of New En- glanders come from external markets. Roughly 80 percent of its meat, vegetables, and fruit are imported from outside the re- gion. The availability and the cost of food are affected by transportation strikes and midwestern droughts. Energy comes from imported oil and gas, augmented by wood- burning stoves and some locally generated nuclear energy. Energy availability is sub- ject to global shortages and price varia- tions. Clothing is largely imported from southern and foreign textile mills, where wage labor is cheaper and supplemented by local and cottage clothing industries. As in the country as a whole, fast food is often prepared from imported beef raised in Central and South America at the expense of tropical rain forests and served in styro- foam containers at the expense of the global ozone layer.

This dependence on outside markets has moved some types of environmental degra- dation beyond New England's boundaries,

allowing portions of its own environment to recover. The twentieth-century decline in farming and the changeover to oil have resulted in the regrowth of the New En- gland forest. Eighty percent of the land is once again forested, close enough to the 95 percent on the eve of colonization to pro- vide a sense of how the original forest (mi- nus its largest giants) might have looked. Maine, New Hampshire, and Vermont are among the four most heavily forested states in the nation. Sixty-two percent of New England's forested acreage, however, is held in small parcels by individuals, most of whom own less than fifty acres, and many of whom are urbanites with country retreats who are conscious of envi- ronmental preservation. The lumber in- dustry owns only 32 percent of this acre- age; the remaining 6 percent is public land. Major public policy issues are in- volved in deciding how the forests should best be used.

Yet this regenerated forest is itself the victim of industrial capitalism. Acid pre- cipitation from the smokestacks of the East and Midwest has attacked New En- gland's crops, trees, and shrubs. Acid rain leaches nutrients from leaves, makes plants more vulnerable to fungal and bac- terial infections, and reduces tree seed- lings and plant productivity. Between 700 and 1,400 wild species are thought to suf- fer from sulfur dioxide and ozone emis- sions. The effects are most visible in higher-elevation coniferous forests, but the damage is universal. Acid rain has raised the acidity of thousands of lakes all over New England and introduced mercury, cadmium, and lead into their ecosystems. With the reduction of zooplankton, phyto- plankton, and mollusks, fish populations have declined, along with waterfowl such as herons, ducks, loons, and ospreys.

The growth of high technology and com- puter-based industries further connects New England to the rest of the planet, al-



tering human perceptions of the earth. The Computer Age has mapped the earth's surface as a grid of Cartesian coordinates bounded by and enclosed within a communications network. Today, the "whole earth" image from a satellite's eye view is no longer an earth apple, but a two-dimensional photograph. Viewed from afar by the spectator, it has become a NATO object detached from human participation. Computer advertisements and popular media depict the earth variously as electronically wired; encircled by floating cars, calculators, and computers; enclosed within laboratory flasks; squeezed by human hands and lemon juicers; and dominated by oversized white males standing on its surface. The symbols of nature that permeate and structure modern consciousness present a mechanized, artificial, instrumental nature. It has become completely mechanical, having lost any semblance of organic life.

The adoption of the mechanistic paradigm throughout the Western world has implications that extend far beyond New England's borders. Based on the mechanistic model, capitalist agriculture over the whole globe has moved increasingly in the direction of artificial ecosystems, built on simplified monocultures that are vulnerable to pest outbreaks and catastrophic collapse. Identical rectangular and circular fields precisely laid out for efficient cultivation, irrigation, and harvesting replicate atomic and latticelike patterns, replacing the diversity of small, haphazard patchworks of fields within forests. Stimulated by urbanization and industrialization, agriculture has developed more efficient machines, genetically "improved" strains of crops and animals, artificial fertilizers, and chemical pesticides. The external energy needed to produce the chemicals, operate the farm machinery, and process, store, and transport the products often surpasses the calories the foods themselves supply. Most of this external energy comes

from fossil fuels by way of industrial systems rather than from the sun by way of photosynthesis.

Ecological thinking, however, offers the possibility of a new relationship between humans and nonhuman nature that could lead to the sustainability of the biosphere in the future. The assumptions of the ecological paradigm contrast with those of the mechanistic, resting on a different set of assumptions about nature: (1) everything is connected to everything else in an integrated web; (2) the whole is greater than the sum of the parts; (3) nonhuman nature is active, dynamic, and responsive to human actions; (4) process, not parts, is primary; and (5) people and nature are a unified whole.

Ecology also offers a new ethic for grounding human relations with nature. Mechanism is consistent with a homocentric ethic of "natural rights" in which each individual uses nonhuman nature to maximize his or her self-interest. An egocentric ethic, however, is based on a network of mutual obligations rather than natural rights, and on values that are based on the ecosystem rather than on human interests. The land ethic of ecologist Aldo Leopold (1949) enlarges the boundaries of the community to include "soils, waters, plants, and animals, or collectively, the land." "A thing is right," according to Leopold, "when it tends to preserve the integrity, beauty, and stability of the biotic community. It is wrong when it tends otherwise."

Although much of scientific ecology has appropriated the reductionist approach of the mechanistic model, human ecology includes human beings as part of the natural world and recognizes their ability both to destroy as well as to live within the limits of local ecosystems. But for an ecological model to replace mechanism as the dominant paradigm for decision making would require not merely an intellectual, but a global, social, and economic revolution.

The capitalist relations of production and the patriarchal relations of reproduction that support mechanistic control would have to give way to new economic forms, new gender relations, and an ecological ethic.

Nevertheless, the possibility of such a global ecological revolution is occurring. A global ecological paradigm transcends national boundaries and suggests a transition to a sustainable world. Global resource depletion and environmental degradation have appeared at the intersection of capitalist (as well as Soviet) economic development and ecology. Nuclear war, power plant accidents threatened with radioactive, cancer-causing fallout, and the burning of fossil fuels for energy production increases carbon dioxide in the atmosphere, while the cutting of rain forests for grazing and conversion to oxygen, contribute to global warming and melting ice. The "greenhouse effect" alters weather patterns that affect agriculture, and the ecology of local habitats. Vast quantities of plastic waste from durable industrial plastics pollute the oceans. As chlorofluorocarbon compounds used for refrigerants and styrofoam production age, the earth's protective ozone layer is threatened. Toxic wastes from industries enter ground water, threatening human health. Acid rain from coal-burning "smokestacks" crosses national boundaries, increasing the acidity of lakes and damaging forests. Habitat destruction from industrial development endangers hundreds of species around the whole globe.

Other disjunctions are occurring at the intersection of production and reproduction. Global population continues to grow exponentially despite declining birth rates in developed nations and increasing populations in developing countries, putting pressure on local economies and land. Such pressure

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Nevertheless, the possibility exists that such a global ecological revolution may be occurring. A global ecological crisis that transcends national boundaries could trig- ger a transition to a sustainable earth. Global resource depletion and pollution have appeared at the intersection of capi- talist (as well as Soviet) economic produc- tion and ecology. Nuclear war and nuclear power plant accidents threaten the earth with radioactive, cancer-causing emissions. The burning of fossil fuels for industrial production increases carbon dioxide in the atmosphere, while the cutting of tropical rain forests for grazing and crops reduces its conversion to oxygen, resulting in global warming and melting ice caps. This "greenhouse effect" alters weather pat- terns that affect agriculture, fishing, and the ecology of local habitats. Nondegrad- able industrial plastics pollute soils and oceans. As chlorofluorocarbons are pro- duced for refrigerants and styrofoam pack- aging, the earth's protective ozone layer is threatened. Toxic wastes from chemical in- dustries enter ground water supplies, threatening human health. Acid rain from coal-burning "smokestack" industries crosses national boundaries, increasing the acidity of lakes and damaging forests. Habitat destruction from industrial expan- sion endangers hundreds of indigenous species around the whole globe.

Other disjunctions are occurring at the intersection of production and reproduc- tion. Global population continues to grow exponentially despite declining reproduc- tive rates in developed nations. Increased populations in developing countries put pressure on local economies and conse- quently on the land. Such pressures chal-

lenge traditional sex-gender roles and cre- ate new patterns in both production and biological reproduction. The emergence of worldwide "green" political parties is in part a response to the failure of the legal- political frameworks that reproduce capi- talist society to regulate pollution and de- pletion. These tensions within production and reproduction are experienced as threats to the health and survival of both human and nonhuman nature.

The outcome of this global ecological cri- sis in production and reproduction could be negative or positive. A pessimistic scenario would be the crisis and collapse predicted by the "limits to growth" models of the 1970s and the Malthusian dilemma of ex- ponential population growth outrunning the food supply. A positive outcome, how- ever, could be the crisis and reorganization implied by the "order out of chaos" ap- proaches of Ilya Prigogine and Erich Jantsch, moving the entire globe toward ecological and economic sustainability in the twenty-first-century. New forms of pro- duction, reproduction, and consciousness could structure the world differently for twenty-first century citizens.

The transition to a sustainable world would entail changes in production and re- production that emphasize ecodevelopment in both developed and developing coun- tries. Colonial and capitalist forms of ex- ploitation of nature and Third World peoples would give way to priorities that fulfill subsistence and quality-of-life needs. These would be enhanced by global efforts to conserve energy and renewable natural resources, recycle nonrenewable resources, and adopt appropriate technologies. Eco- logical and economic development, if sensi- tively structured by the developing coun- tries themselves, could pave the way to the demographic transition that has lowered reproductive rates in developed countries. Changes in production would thus support changes in reproduction and both together

would alleviate human pressures on the global ecosystem. This transition would be legitimated by changes in values and in ways that people perceive, know, and structure reality.

Supporting the emergence of a transformation of consciousness are calls by physicists, ecologists, feminists, poets, and philosophers for philosophical changes that would reintegrate culture with nature, mind with body, and male with female modes of experiencing and representing "reality." They suggest that nature as actor may now be breaking out of the mechanistic straightjacket in which human representations have confined it for the past three hundred years. Through the social construction of a new reality, future generations may learn a worldview that is nonmechanistic. When philosopher Max Horkheimer, writing in 1947, called for the revolt of nature, he invited it to speak in a language other than instrumentalist. "Once it was the endeavor of art, literature, and philosophy to express the meaning of things and of life, to be the voice of all that is dumb, to endow nature with an organ for making known her sufferings, or we might say, to call reality by its rightful name. Today nature's tongue is taken away. Once it was thought that each utterance, word, cry, or gesture had an intrinsic meaning; today it is merely an occurrence." The voice with which nature speaks and is heard by humans is tactile, sensual, auditory, odoriferous, and visual—not disembodied reason, but visceral understanding.

"In the present crisis," Horkheimer continued, "the problem of mimesis is particularly urgent. Civilization starts with, but must eventually transcend and transvaluate, man's native mimetic impulses. . . . Conscious adaptation and eventually domination replace the various forms of mimesis . . . the formula supplants the image, the calculating machine the ritual dances." To survive we must once again recover the

meaning of mimesis, actively making ourselves "like" the environment, not as object, but in the deepest sense of visceral reemerging with the earth.

Emerging from concerns over the earth's future is a spectrum of new sciences infused with an ecological perspective. At their root is mimesis in a new form—integrative thinking. Imitation, synthesis, and creative reciprocity between humans and nonhuman nature constitute a form of consciousness in which tacit knowing through the body and information networks ("mind") in nature links humans to the nonhuman world. The new theoretical frameworks challenge positivist epistemology through participatory forms of consciousness. Gregory Bateson's "ecology of mind" sees nature as a network of information moving from brain to hand to stick to rock to earth to eye to brain. "Mind" in nature integrates human subject and active object into a larger network of energy and information exchange. Nature is a changing whole consisting of interactions and processes interpreted by humans. The body's tacit knowledge is one with the mind.

Philosophers have proposed alternatives to the mechanistic framework based on nature's inherent activity, self-organization, permeable boundaries, and resilience. Deep ecologists argue that reform environmentalism is insufficient to deal with the magnitude of global environmental problems. They call for a fundamental transformation in Western epistemology, ontology, and ethics. Deep ecology represents a change from a mechanistic to an ecological consciousness rooted in biospecies equality, appropriate technologies, recycling, and bioregions as ecological homes. The new philosophy is infused with an environmental ethic oriented toward establishing sustainable relations with nature.

Structural changes within science itself may also be indicative of the emergence of

a new paradigm. The new physics (Bohm contrasts the older world picture of atomic fragmentation with a new physics of wholeness expressed in the ing and enfolding of moments in "holomovement." His cosmology is the primacy of process rather than domination of parts. The Gaia hypothesis of British chemist James Lovelock poses that the earth's biota as a whole maintain an optimal chemical composition within the atmosphere and oceans to support its life. Gaia, the name of the Greek earth goddess, is a metaphor for a self-regulating (cybernetic) system that controls the functioning of the chemical cycles. Chaos theory in mathematics offers tools for describing complexity and turbulence consistent with that nature as actor offers surprising catastrophes that cannot be predicted by linear equations and mechanistic models.

Coupled with these changes in epistemology, and ethics are new sciences oriented toward effecting transition to ecological sustainability. Transition is the active reconstruction of ecosystems (such as prairies, grasslands, rivers, and lakes). By studying and mimicking natural patterns, the wisdom inherent in evolution can be recreated rather than taking nature apart and simulating ecosystems, as the past three centuries of mechanistic science have taught us so supremely well, restorationists are putting it back together. Rather than analyzing nature for the sake of doing it and controlling it, restorationists are synthesizing it for the sake of living with it fully within the whole.

Agroecology looks back to traditional agriculture and mimics its polycultural patterns. Traditional farming—developed over generations of trial and error through local knowledge and the transmission of successful adaptations from farmer to farmer—

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 Coupled with these changes in science,  
 epistemology, and ethics are new applied  
 sciences oriented toward effecting a transi-  
 tion to ecological sustainability. Restora-  
 tion is the active reconstruction of pristine  
 ecosystems (such as prairies, grasslands,  
 rivers, and lakes). By studying and mim-  
 icking natural patterns, the wisdom inher-  
 ent in evolution can be re-created. Rather  
 than taking nature apart and simplifying  
 ecosystems, as the past three centuries of  
 mechanistic science have taught us to do  
 supremely well, restorationists are actively  
 putting it back together. Rather than ana-  
 lyzing nature for the sake of dominating  
 and controlling it, restorationists are syn-  
 thesizing it for the sake of living symbioti-  
 cally within the whole.  
 Agroecology looks back to traditional ag-  
 riculture and mimics its polycultural pat-  
 terns. Traditional farming—developed over  
 generations of trial and error through deep  
 local knowledge and the transmission of  
 successful adaptations from fathers and

mothers to sons and daughters—is joined  
 with an understanding of local ecology. The  
 polycultures of traditional farmers often  
 are more productive, are more resistant to  
 pests, and use better-adapted varieties of  
 crops than are monocultures of imported  
 seed supported with herbicides and artifi-  
 cial fertilizers. In designing agroeco-  
 systems, the spatial arrangements and  
 seasonal development of wild plant species  
 are used as models. Arrangements of local  
 species of grasses, vines, shrubs, and trees  
 are simulated in designing integrated ce-  
 real, vegetable, fruit, and tree crop sys-  
 tems. Similarly, agroforestry restores the  
 complementary arrangements of trees, crops,  
 and animals in combination with ecological  
 principles in order to maintain productivity  
 without environmental degradation. Or-  
 chards planted with ground covers of  
 legumes or berries and foraged by poultry,  
 pigs, and bees keep down pests and produce  
 well-mulched and manured soil.  
 The biological control of insects also uses  
 natural ecosystems as models. Unculti-  
 vated land surrounding fields harbors birds  
 and insect enemies as well as pests. Flow-  
 ers along roadsides and fences are espe-  
 cially attractive to beneficial insects. Di-  
 versity in crops and surroundings and  
 arrangements of beneficial plants mimic  
 natural conditions, making crops less vis-  
 ible to insect enemies and acting as barri-  
 ers to pest dispersal. By imitating nature,  
 agricultural systems can be designed that  
 both suppress pests and maximize total  
 yield.  
 A global ecological revolution would also  
 reconstruct gender relations between  
 women and men and between humans and  
 nature. The domination of women and na-  
 ture inherent in the market economy's use  
 of both as resources would be restructured.  
 Both radical and socialist feminist theories  
 present alternatives to patriarchal and  
 capitalist ecological relations. But while  
 radical feminism has delved more deeply

into the woman-nature connection, socialist feminism is more consistent with the concept of the social construction of ecological revolutions.

For radical feminists and ecofeminists, human nature is grounded in human biology. Humans are biologically sexed and socially gendered. Sex-gender relations give men and women different power bases; hence the personal is political. The ontology and epistemology of the mechanistic worldview are deeply masculinist and exploitative of nature, which has historically been characterized in the female gender. Male-designed and produced technologies neglect the effects of nuclear radiation, pesticides, hazardous wastes, and household chemicals on women's reproductive organs and on the ecosystem. Often stemming from an antiscience, antitechnology standpoint, radical feminism celebrates the relationship between women and nature through the revival of ancient rituals centered on goddess worship, the moon, animals, and the female reproductive system. Its philosophy embraces intuition, an ethic of caring, and weblike human-nature relationships. Yet in emphasizing the female, body, and nature components of the dualities male/female, mind/body, and culture/nature, radical feminism runs the risk of perpetuating the very value hierarchies it seeks to overthrow.

Socialist feminism and socialist ecofeminism incorporate many of the insights of radical feminism, but view both knowledge and reality as historically and socially constructed. What counts as human nature is the product of historically changing interactions between humans and nature, men and women, social classes, races, ages, and national origins. Like Marxist feminists, socialist feminists see nonhuman nature as the material basis of human life, supplying the necessities of food, clothing, shelter, and energy. Nature is transformed by human science and technology for use

by all humans for survival. Any meaningful analysis must be grounded in an understanding of power in both the personal and political spheres. Like radical feminism, socialist feminism is critical of mechanistic science's treatment of nature as passive and its male-dominated power structures. It deplores the omission of women's reproductive roles and gender analysis in history and would give reproduction a central place in theory construction. Socialist feminism views change as dynamic, interactive, and dialectical, rather than linear or incremental. Although as yet socialist feminism has had little to say about ecology, it is compatible with a view of nonhuman nature as a historical actor, with the ecological goal of developing sustainable, non-dominating relations with nature.

An ecological transformation in the deepest sense entails changes in ecology, production, reproduction, and forms of consciousness. Ecology as a new worldview could help resolve environmental problems rooted in the industrial-mechanistic mode of representing nature. In opposition to the subject/object, mind/body, and culture/nature dichotomies of mechanistic science, ecological consciousness sees complexity and process as including both culture and nature. In the ecological model, humans are neither helpless victims nor arrogant dominators of nature, but active participants in the destiny of the webs of which they are a part.

Although many changes leading to a healthier, sustainable biosphere seem to be occurring, the forces that encourage the current patterns of global resource depletion and pollution are very strong. Patriarchy, capitalism, and the domination of nature are deeply entrenched and function to maintain the present direction of development. Yet one may hope that a sustainable global environment, society, and ethic will emerge in the twenty-first century.

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## GLENN C. LOURY

Glenn C. Loury (b. 1948) is a prominent scholar whose current appointment is as professor at the John F. Kennedy School of Government at Massachusetts Institute of Technology. He has been at Northwestern University and the University of California, Berkeley Kennedy School in 1982. He has won the National Endowment for the Humanities Fellowship (1985-86) and the Leisler Fellowship (1987). In addition to his work on resource management, he regularly writes and speaks on issues involving African Americans.

The excerpt here was given as a lecture at the W. M. Keck Foundation, a conservative Washington, D.C., organization, on May 12, 1990, as part of a series of lectures that challenges both liberals and conservatives. Loury takes issue with King's approach by arguing that the civil rights movement's emphasis on group responsibility rather than group responsibility is flawed. They need to address the big-city ghettos and engage in the middle ground between today's left and right of the civil rights movement.

## Achieving the "Dream": A Call in the Spirit of Martin Luther King

*Therefore, since we are surrounded by a great cloud of witnesses, let us not lose heart. We must not allow ourselves to be discouraged, and the sin of despair easily entangles, and let us run with endurance the race marked out for us by the Lord Jesus Christ. Hebrews 12:1, NIV*

The struggle for freedom and equality is the central theme in the black American experience.