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6

SOCIAL ECOLOGY

Picture a group of eight or ten intense, younger middle-aged men and women dressed indifferently in jeans and slogan-bearing T-shirts, sitting around a cracked Formica™ table under harsh fluorescent light...The remains of corned-beef-on-rye sandwiches are shoved to one side. Political posters dot the dingy walls. The group is discussing the best strategy to use to mobilize dock workers to support a solidarity strike—to refuse to unload grapes, melons, and cherries grown in Pinochet's Chile. Through the grimy window panes, the sullen outlines of warehouses and factories are visible in the San Francisco fog.

Now picture a group—about the same size—of men and women—about the same age—gathered around a Warm Morning woodburning stove. Under the turned-up sleeves of their Pendleton shirts protrude the men's waffle-weave long underwear...The women are wearing brightly patterned blouses and long skirts or sweaters and cross-country ski knickers....A potluck supper of brown rice, lentil soup, and steamed vegetables simmers on the cook stove. They are discussing what crops to plant in their cooperative fields and... how best to present the economic advantages of organic agriculture....Through the tilted panes of the passive solar herbarium, the snow-covered rolling Wisconsin fields sparkle in the mid-afternoon February sun.¹

PROGRESSIVE ECOLOGY: "MARX MEETS MUIR"

Frances Moore Lappé, author of *Diet for a Small Planet*, and philosopher J. Baird Callicott, champion of ecologist Aldo Leopold's land ethic, set the above scenes and ask "Who could imagine, that these two groups of people could even talk to each other, much less have anything to say?" They then offer ways to unite the traditions of Karl Marx and conservationist John Muir.

Lappé and Callicott see the conflict between social progressives and environmentalists as stemming from seemingly antagonistic perspectives. For environmentalists, the progressive goal of the abolition of poverty and redistribution of wealth seems achievable only if nature becomes a warehouse of raw materials—a passive backdrop to industrialization. Progressives, on the other hand, view environmentalist goals of saving wilderness and improving environmental quality as benefiting white middle-class élites, while alienating the hungry, homeless, and jobless.

Yet underneath the conflict, argue Lappé and Callicott, is a common ethic of outrage over the impact of industrialization on laboring peoples and on nature. Industrial development has brought neither social justice nor a healthy environment to all people. Both the progressive and environmental movements look beyond the individual to the social and environmental whole for values by which to restructure the world. For both visions, the environment and society are the living contexts of life. Species exist in relationship to other biota and the physical environment that sustains them; humans exist as parts of an interdependent social community.

What specifically can the two movements contribute to each other? People working together can create opportunities to keep their own environments clean and to remove neighborhood poverty. But a world in which there is room for both humans and wildlife cannot be achieved by biological methods or social programs alone. Expanding meaningful opportunities for employment, especially for women; food and housing subsidies; and appropriate technologies that can be repaired at the local level are methods that can help to lower population growth rates. Ecologically sensitive agriculture that helps to reduce pesticide residues and water salinization could improve social conditions. A system in which farmers have a personal relationship to their land that continues over time could maintain healthy ecological conditions. Through carefully crafted local programs, a synthesis of progressive politics and social ecology could contribute to a viable world.

Like Lappé and Callicott, many people are searching for ways to resolve the contradiction between production and ecology. Calling themselves variously social ecologists, socialist ecologists, green Marxists, and red greens, they ground their approach in an ecologically sensitive form of Marxism. Social ecologists focus on the relations of production and the hegemony of the state in reproducing those relations. Their ethic is basically homocentric, inasmuch as social justice is a primary goal, but it is an ethic informed and modified by ecological and dialectical science. The analysis of the theorists of this chapter both informs and draws on the actions of left greens, social and socialist ecofeminists, and many activists in the Third World sustainable development movement (see chapters 7, 8, and 9).

MARX AND ENGELS ON ECOLOGY

For most people, Marxism is synonymous with the rigidity and oppression of the bureaucratic states of the Soviet Union, Eastern Europe, and China. Moreover, Marx's prediction that capitalism would generate economic and social crises that would lead to socialist revolutions in capitalist countries, led by the working classes, has not been borne out. Marx's emphasis on the law-like characteristics of a society's economy placed less stress on the role of social movements, politics, culture, and consciousness in transforming society than on the overthrow of the mode of production. Since the 1960s, however, Marxist theorists have emphasized the processes by which people are socialized through gender, race, and class and the ways in which social movements can identify and alter those patterns. Many groups, including the New Left, democratic socialists, socialist feminists, and racial and religious minorities have found insights in the writings of Marx and Engels that promote goals of liberation, freedom, and economic equality. The same is true of ecological Marxists, who emphasize not the control and domination of nature, but rather the ways in which ecological theories and green social movements can help to transform people's consciousness and practices toward nonhuman nature.²

Although Marx and Engels certainly argued that the domination of nature through science and technology would relieve humankind of the "tyranny" imposed on it by nature in procuring the necessities of life (food, clothing, shelter, and fuel), they were also acutely conscious of the "ecological" connections between humans and nonhuman nature. Like many critics today,

they reacted against the mechanistic worldview of the seventeenth century. This mechanical materialism assumed that matter was made up of inert atoms and that all change was externally caused. Perception is explained as the result of corpuscles of light hitting an object such as a table or pencil, entering the eye, and being recorded as an impression on the brain. The individual is the passive receptor of information, just as the worker is the passive receptor of the capitalist's decision to offer minimal wages. Any worldview that casts the laborer as a powerless recipient of the ideas of a controlling élite is not healthy for her or him.

Similarly, the alternative view, prevalent in Marx's time, that the world was fundamentally spirit or idea, working itself out through history—the view of German philosopher Georg Hegel—was equally problematical. This worldview likewise rendered laborers powerless to change their destinies. What both the mechanists and the Hegelians had left out of their philosophies were social relations. People are born into a given type of society at a given time in history. Their place in that society is the perspective from which they view the world. Those in control of the society—the élite—will use the worldview to justify and maintain their hegemony. But laborers, artisans, minorities, and the poor have a choice of ways in which to view the world. They do not have to accept the mechanistic philosophy that renders them passive receptors of knowledge. More compatible with their social needs is a worldview that makes change, rather than *stasis*, central.

In arriving at a theory of social change, Marx borrowed from both of the schools he rejected. With the mechanists, he asserted the reality of the material world. Matter and its manifestations in natural resources, food, clothing, shelter, and the essentials of life were real. Yet changes in the material world were not external to it, as mechanical materialism held, but internal. With Hegel, he asserted that the process of change was dialectical. The material world is continually in a process of change. This is because every event has both positive and negative forces. Everything is also not something else. It *is* by virtue of what it *is not*. The real can be defined only through contrasts. Each thing, therefore, is also its opposite. This tension, or contradiction, between a thing and its opposite destroys both and creates something new. Being (the thesis) inherently contains its own contradictions, not-being (the antithesis), and the tensions between them are a new becoming (the synthesis).

Through this dialectical process, humans make their own history. The élite society of Greece that developed philosophy and democracy, did so only

because of its simultaneous dependence on slavery and sexism. The contradictions between freedom and unfreedom, between élite domination and dependency on the dominated eventually led to the downfall of the ancient social system. Medieval feudalism contained a similar contradiction between free lord and unfree serf; yet serfs, unlike slaves, had certain rights to natural resources and the manor commons. Without the serf to make in-kind payments of food and fuel, the lord by definition would not be lord. Similarly, capitalists depend on wage laborers and vice versa, but the mutual contradictions between their interests create tensions that lead to social transformation. Today, the economic dependencies of the First World on the natural resources and labor of the Third World create similar patterns of dominance. As dominators, we are ourselves dominated because of our dependence on the dominated.

Seeing the world as fundamentally process and change, however, has implications not only for society, but also for nature. Marx, in his *Economic and Philosophical Manuscripts of 1844*, recognized the interdependence of humans and nature, an idea now central to the ecological vision. People, he asserted, were active natural beings who were corporeal and sensuous and who, like animals and plants, were limited and conditioned by things outside themselves. They were both different from these objects and yet dependent on them. "The sun is the object of the plant—an indispensable object to it, confirming its life—just as the plant is the object of the sun, being an expression of the life-awakening power of the sun." Like today's ecologists, Marx recognized the essential linkages between the materials that make up the human body and nonhuman nature. "Nature is man's inorganic body," he wrote. "Man lives on nature—means that nature is his body, with which he must remain in continuous interchange if he is not to die. That man's physical and spiritual life is linked to nature means simply that nature is linked to itself, for man is a part of nature."³

Humans, however, differed from other animals in the way in which they obtained the essential food and energy to continue living. What distinguished humans, thought Marx and Engels, was their capacity to produce, using tools and words. The tools of animals were, in most cases, parts of their bodies, with inconsequential effects on nature. Humans, by contrast, transformed external nature with instruments that were socially organized. In different periods in history, humans organized their instruments and labor into different modes of production. Gathering-hunting, horticulture, feudalism, capitalism, and

socialism are different modes of production that transform nature in different ways.

Essential to the "ecological" vision of Marx and Engels is their study of the history of human interactions with nature. Early societies, they argued, had a different relationship to nature than do capitalist societies. While pastoral societies wander, taking from nature that which is necessary for life, horticultural societies settle down and appropriate the earth's resources for their own sustenance. Humans thus modify external nature, using the local climate, topography, and flora and fauna for their own purposes. The settled community uses the earth as "a great workshop," for its labor. Human labor, on the one hand, and the earth with its soils, waters, and organic life as instrument of labor on the other hand, are both necessary for the reproduction of human life. Humans, isolated from society, would live off the earth as do other animals.

For the earth to be appropriated as property humans must settle on the land and occupy it. Under capitalism, the earth is bought and sold as private property. Here, according to Engels, the earth is peddled for profit. "To make the earth an object of huckstering," he wrote, "—the earth which is our one and all, the first condition of our existence—was the last step toward making oneself an object of huckstering." It is the ultimate in alienation. In the capitalist appropriation of the earth for profit, raw materials, taken from the earth, such as coal, oil, stone, and minerals, are the result of natural forces. They are the "free gift of Nature to capital." Nature produces them and the capitalist pays the laborer to transform them. Similarly, physical forces, such as water, steam, and electricity cost nothing. Science, likewise, costs capital nothing, but is exploited by it in the same manner as is labor.⁴

But these modes of transforming nature have unforeseen side effects. Like modern ecology, which is premised on the concept that everything affects everything else, Engels noted in his *Dialectics of Nature* that "in nature nothing takes place in isolation. Everything affects every other thing and vice versa, and it is mostly because this all-sided motion and interaction is forgotten that our natural scientists are prevented from clearly seeing the simplest things."

Engels warned that people should not boast about their ability to master nature because there were always harmful consequences of such conquests. Goats grazing on Greek hillsides prevented forests from regenerating

themselves. Sailors arriving on Greek islands introduced goats and pigs that destroyed native vegetation and prepared the way for cultivated crops and weeds that obliterated native species and even the wild ancestors of grains. In Mesopotamia, Greece, and Asia Minor, those who cut down forests to plant crops did not predict that they were simultaneously destroying the collectors of moisture on which the land depended. The Italians who cut down fir forests in the Alps did not realize that they were destroying the watersheds on which the dairy industry they were introducing depended and, at the same time, creating the conditions for flooding the plains below. When the potato was introduced into Europe from the New World, those who did so did not consider the possibility that they were simultaneously spreading the disease of scrofula. Spanish planters in Cuba, who burned forests on steep mountainous slopes for one generation's worth of coffee profits, did not care about the erosion and ruined soil that took its toll on those that followed.⁵

"Thus at every step," Engels admonished, "we are reminded that we by no means rule over nature like a conqueror over a foreign people, like someone standing outside nature—but that we, with flesh, blood, and brain, belong to nature, and exist in its midst, and that all our mastery of it consists in the fact that we have the advantage over all other creatures of being able to know and correctly apply its laws." The more one understands the laws of nature and the consequences of human actions, he went on, the more humans will come to "know themselves to be one with nature," and that there is no inherent "contradiction between mind and matter, man and nature, soul and body." These dualisms originated in the philosophy of ancient Greece, were reinforced by Christianity in the Middle Ages, and codified by the philosophers and scientists of the seventeenth century. Their dissolution is one of the goals of the radical ecological and ecofeminist movements today.⁶

In *Capital*, Marx analyzed some of the "ecological" side effects of the capitalist mode of production. He argued that capitalist agriculture, much more than communal farming, wastes and exploits the soil. In agriculture geared toward production for profit, the soil's vitality deteriorates because the competitiveness of the market does not allow either large-scale owner or tenant farmer to introduce the additional labor or expense needed to maintain its fertility. The agricultural population declines as the industrial-urban population mounts, and as Marx noted (following nineteenth-century chemist Justus Liebig), the marketed produce carries with it the molecules of soil-building

nutrients. Large-scale agriculture and large-scale industry mutually support the enervation of both laborer and soil, breaking "the coherence of social interchange prescribed by the natural laws of life."

Capitalist agriculture, Marx observed, is progress in "the art, not only of robbing the laborer, but of robbing the soil; all progress in increasing the fertility of the soil for a given time, is a progress towards ruining the lasting sources of that fertility." It progresses only "by sapping the original sources of all wealth—the soil and the laborer." Small farming is not feasible because there is insufficient land for all to be rural land holders. Moreover, the labor of the small farmer is isolated from the larger society. Under communal production, however, there is the possibility of "conscious rational cultivation of the soil as eternal communal property, an inalienable condition for the existence and reproduction of a chain of successive generations of the human race."⁷

Industrialization, according to Marx, resulted in similar "ecological" problems. Wastes from industry and human consumption accumulated in the environment and were not reused by the capitalist unless the price of raw materials soared. Marx gave numerous examples of capitalist pollution: chemical by-products from industrial production; iron filings from the machine tool industry; flax, silk, wool, and cotton wastes in the clothing industry; rags and discarded clothing from consumers; and the contamination of London's River Thames with human waste. Yet this waste that clogged and polluted waterways was very valuable and had the potential to be recycled by industry. The chemical industry could reuse its own waste as well as that of other industries, converting it into useful products such as dyes and rugs. The clothing industry could improve its use of the waste through more efficient machinery. Human waste could be treated and used to build soil fertility. An "economy of the prevention of waste" that reused all waste to the maximum was required.⁸

Marx assumed a two-level structure of society: the economic base or mode of production (which consisted of the forces and relations of production) and the legal-political superstructure (Figure 6.1). Together these constituted the social formation. Different modes of production, such as primitive communism, ancient, Asiatic, feudal, capitalist, and socialist, had different legitimating superstructures. Marx's theory of social change was based on a conflict between the material forces of production and the social relations of production. This dialectic initiates an era of social revolution

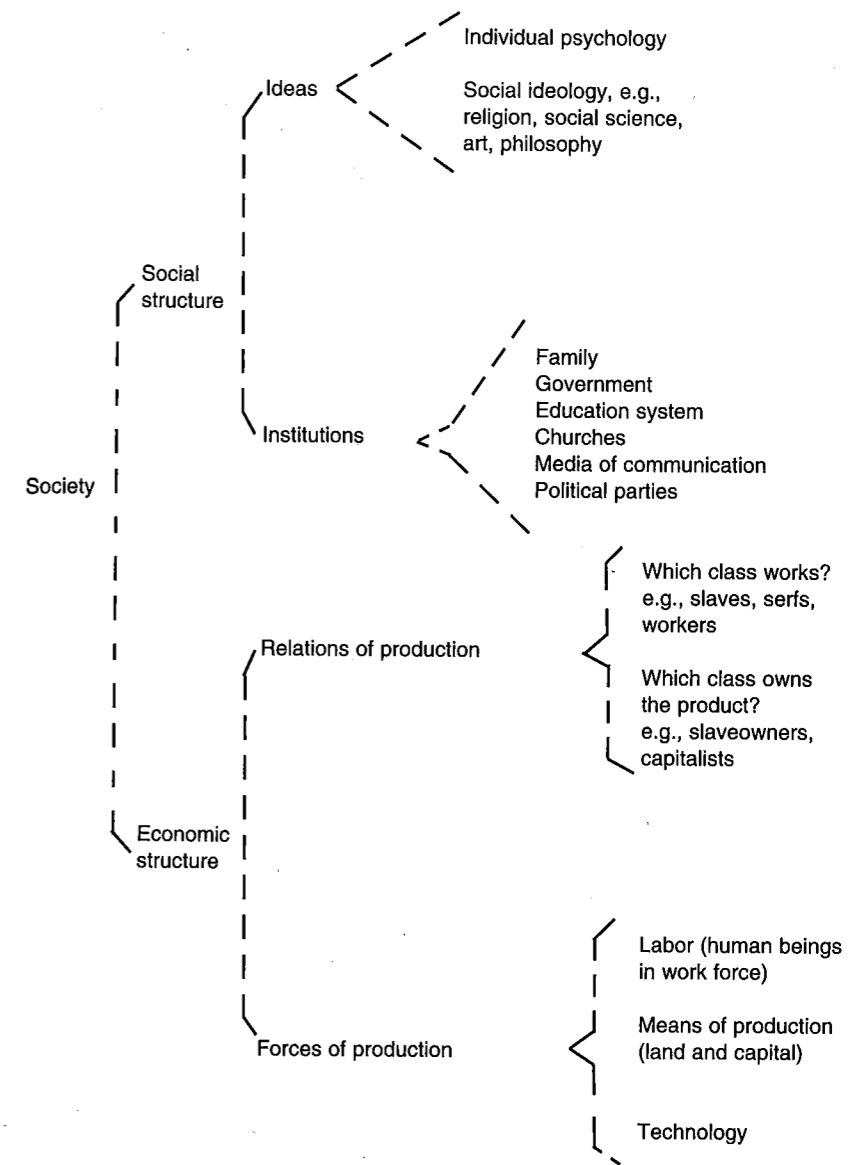


Figure 6.1 Marxist Framework of Social Analysis

Source: Howard Sherman, *Foundations of Radical Political Economy* (Armonk, NY: M.E. Sharpe, 1987), 44, reprinted by permission.

in which the economic foundation breaks down leading to a change in the superstructure. Today social ecologists envision a transformation of the global capitalist economy and its legitimating mechanistic worldview to a sustainable economy and a process-oriented ecologically-based science. It would be brought about by social movements, especially those concerned with environmental health and quality of life.

ANARCHIST SOCIAL ECOLOGY

Current theories of social ecology draw on Marx and Engels' approach to "ecology" and society. Additionally, social ecologists draw their ideas from premodern tribal societies, Eastern cultures, and from analyzing the ecological problems of capitalist, socialist, and Third World countries. For anarchist philosopher Murray Bookchin, social ecology is rooted in the balance of nature, process, diversity, spontaneity, freedom, and wholeness. His ideal society would eliminate all hierarchies in ecology and in society. The ecological society of the future would reclaim the fundamental organic non-hierarchical relationships of preliterate peoples. This would not be a return to a foraging economy or to a "primitive" past, however, but a movement beyond capitalism and toward a society free of the domination of human beings and the exploitation of human labor. Above all, it would value human reason and human freedom.⁹

Early preliterate societies, Bookchin argues, were organic. Although there were differences based on age, gender and kinship, such societies saw themselves as neither superior to nor inferior to nonhuman nature. They were within nature. Their differences with each other and with nature constituted what Hegel called a "unity of differences," or a "unity of diversity." Male decision-making roles in the civil sphere were balanced by the power of women in the domestic sphere. Women's central role in foraging and horticulture offset men's role in hunting. With the continuing influence of elders, however, male authority and prestige increased and organic society broke down. Hierarchy destroyed the original egalitarian balance; males became dominant over females and children. Scarcity and warfare escalated the problems created by the twin pillars of dominance and hierarchy, and non-egalitarian culture continued in all subsequent societies. Today dominance and hierarchy permeate all aspects of life, especially in the dominance of the intellectual over the physical, work

over pleasure, and mental control over sensuous body. A major goal of social ecology is to abolish these dualisms.¹⁰

Capitalism not only reinforces such dualisms, but it stands in fundamental contradiction to the autonomy of the natural world. Its growth-oriented imperative drives society ever more deeply into the devastation of nature. Pollution, radioactive fallout, toxics in food, and environmental degradation are all inevitable products of capitalist development. Capitalism has not only created a totally synthetic environment, but has demonstrated a remarkable resilience and ability to absorb ideas that seem opposed to it. It embraces any religions and forms of spirituality as long as they do not challenge its dominance.¹¹

In an ecological society, Bookchin argues, dominance and hierarchy would be replaced by equality and freedom. An "ecology of freedom" would reunite humans with nature and humans with humans. This would be achieved through an organic, process-oriented, dialectic that would reclaim the outlook of preliterate peoples. The merging of their ecological sensibility with the analytical approach of western culture would produce a new consciousness. Thus the advances of science and technology could be retained and infused with an ecological way of living in the world. This approach recognizes the mutual dependence of humans and nonhuman nature. The ecology of freedom is rooted in a concept of ecological wholeness that is more than the sum of its parts. "Unity in diversity" means the unfolding of the processes of life. Bud is replaced by flower and flower by fruit, as moments in an emerging unity. Spontaneity is the continual striving of nature toward change and of humans toward greater self-awareness and freedom.

Bookchin distinguishes between ecology and environmentalism. Environmentalism adopts the mechanistic, instrumental outlook of the modern world that sees nature as a resource for humans and humans as resources for the economy. Nature consists of passive resource objects in habitats constructed for human benefit. Environmentalism does not question the status quo, but facilitates the domination of humans over nature and humans over other humans. Ecology, premised on interactions among the living and non-living, contains the potential for an alternative. Social ecology incorporates humans and their interdependences with nonhuman nature. Bookchin uses the term ecosystem to mean "a fairly demarcatable animal-plant community and the abiotic or nonliving factors needed to sustain it." Extended to society, it

becomes "a distinct human and natural community, [including] the social as well as organic factors that interrelate with each other to provide the basis for an ecologically rounded and balanced community."¹²

Social ecology studies the patterns that make up the natural/social community, attempting to discern its history and inner logic. It uncovers the rich variety and diversity that are present in the community's evolution. An ecological approach to community leaves room for spontaneity, both in nature and human nature. Biological and evolutionary forces that have resulted in the diversity found in nature must be fostered rather than controlled. Management should be like steering a ship by knowing the direction and strength of the current, waves, and winds, rather than a total domination oriented toward human benefit.

An ecological perspective challenges hierarchy in nature. An ecosystem is a food web, not a food pyramid with humans at the top. Each species is equal to every other species and to the abiotic elements that keep its cycles of life and death and predators and prey in motion. A process of development takes place in nature, "the result of an immanent dialectic within phenomena." Thus human communities and natural ecosystems interact with each other as they evolve. Not only do humans transform nature, but nature also transforms humans. Humans are the result of an evolutionary past that includes a primate and animal ancestry as well as a social ancestry. Social evolution took place within specific ecosystems. Nature is not just the passive receptor of human action, but the active transformer of human labor. Thus "nature interacts with humanity to yield the actualization of their common potentialities in the natural and social worlds."¹³

What does all this mean for the future? The world may continue down its present path toward destruction. Or, on the contrary, a reconstruction is possible in which humanity can transform its relationship to the natural world. "Our world," Bookchin believes, "will either undergo revolutionary changes, so far-reaching in character that humanity will totally transform its social relations and its very conception of life, or it will suffer an apocalypse that may well end humanity's tenure on the planet."¹⁴

To avoid the ultimate ecological collapse, Bookchin argues, humans must recognize and live within the requirements of bioregions. The ecosystems within bioregions limit the range of human options to control nature. Technologies, agricultural practices, and community sizes appropriate to the specific conditions of the bioregion are needed. Sufficient decentralization

to avoid pollution and yet maintain and restore the region's native plant and animal life, along with new social institutions compatible with an ecological sensibility are also necessary. Diversity within the bioregion must be encouraged to reverse present trends toward crop monocultures, urban concrete, and mass culture, wiping out eons of evolution overnight. In confronting the stark possibility of the end of diversity, humans must open their imaginations to utopian visions.

Social ecology has a deep commitment not only to reversing the domination of nature, but also to removing social domination. Hierarchical and class inequalities have resulted in homelessness, poverty, racial oppression, and sexism. Of particular concern are forced and insensitive methods of controlling populations, rather than restructuring and redistributing food, clothing, and shelter.

To achieve a truly democratic, egalitarian society, Bookchin espouses a politics of libertarian municipalism—a face-to-face democracy grounded in popular assemblies wherein people make decisions about their own lives, economies, and ecologies. Power is vested in the people themselves as individuals who build a communalism from the local level upward through confederally organized popular assemblies. Decisions are made by interdependent self-governing municipalities, such as the New England town hall meeting. Bookchin's version of anarchism is rooted in democratic community-based decisions arrived at by majority vote. "Majority voting is not only the fairest but the only viable way for a face-to-face democratic society to function, and...decisions made by majority vote should be binding on all the members of the community, whether they voted in favor of a measure or against it."¹⁵

Each municipality has a responsibility to all other municipalities within the larger confederation to which it is bound through an initial agreement. That agreement is a compact, or constitution, arrived at by empowered people, which is binding and indissoluble. A community cannot simply state it is leaving the confederation if it does not agree with a particular decision reached by majority vote. "A community shouldn't be able to say, for example, 'We want to exclude black people, but you in the confederation would force them on us, so we are going to defy you and leave the confederation.'" Such a confederation differs from a state in that power comes from below and is vested in the people and the municipality rather than in state rule. "I reject the...totalitarian notion of total dependence upon the state," Bookchin argues. "I am for interdependence among self-governing people

in assemblies." Problems arise from top-down state power and autocracy, as opposed to bottom up, democratic decision-making.¹⁶

Bookchin argues that certain deep ecologists (see chapter 4) are insufficiently sensitive to social issues, especially regarding population, race, class, and sex. This includes some, although by no means all, supporters of Earth First!, the spiritual Greens, some bioregionalists, and some spiritual ecofeminists. To speak of a global population problem as threatening wilderness and the entire biosphere is incorrectly to analyze the roots of ecological problems by disregarding the differential impact of economic growth, especially capitalist growth, on indigenous people, marginalized rural and urban people, people of color, and women.

Social ecologists decry the idea of involuntary methods of population control, the Malthusian idea that famine, disease, and war are positive checks on population expansion, and the policy that immigration of southern and eastern hemisphere people into northern countries should be tightly restricted. Instead they support an ecologically-based development policy that uses resources in a sustainable way while raising the quality of life and redistributing the means of fulfilling basic needs. The debate between deep and social ecologists highlights differences of opinion on where to place the core of the analysis as well as approaches to solutions. Social ecologists tend to see the problem as rooted in the dialectic between society (especially economies) and ecology, whereas deep ecologists focus on the conflict between the ecological and mechanistic worldviews. Similarly, for social ecologists, action must be focused on ecodevelopment and social justice as opposed to the deep ecologists' goal of transforming the worldview and reclaiming spiritual connections to the earth.

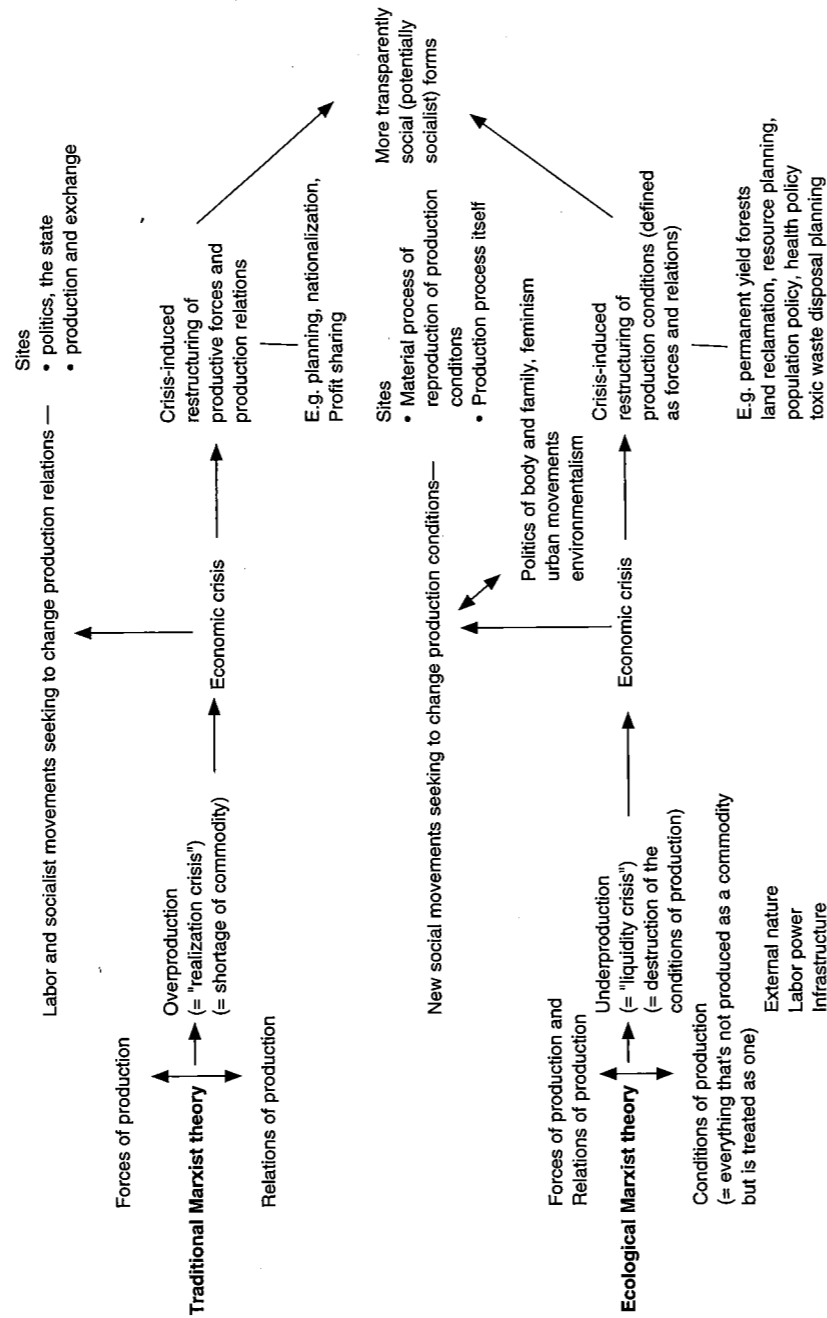
SOCIALIST ECOLOGY

Another alternative rooted in the Marxist tradition is socialist ecology. Socialist ecology offers an eco-economic analysis of the interaction between capital and nature and the transition to a post-capitalist society. Instead of Bookchin's emphasis on hierarchy and domination, a utopian anarchist society modeled on "nature," and a Hegelian dialectic, it envisions an economic transformation to ecological socialism, initiated by new green social movements.

Socialist ecology is spearheaded by economist James O'Connor, author of *The Fiscal Crisis of the State* and other books on economic crises. Rooted in Marx's conceptual framework, it nevertheless goes beyond Marxism to incorporate concepts of ecological science, the social construction of "nature," and the autonomy of nature. It argues that the environment and ecology are the key issues for the late-twentieth and twenty-first centuries, as evidenced by the global ecological crisis and the rapid growth of green social movements, ecofeminism, working-class anti-toxics crusades, and farm-worker anti-pesticide coalitions. It encourages an analysis of the dialectics between economy and ecology and between nature and history. Additionally, it offers a critique of existing socialist societies which have failed to address the ecological crisis and fosters thought about a reconstructive ecological socialism. In addressing the general problem of capitalism, nature, and socialism, it encourages dialogue among Marxists, Marxist-feminists, ecological Marxists, post-Marxists, left-greens, red-greens, and others.

O'Connor's theory of capital and nature is grounded in the traditional Marxian dialectic between the forces of production (technologies) and the relations of production (exploitation of labor by capital). This dialectic is the first contradiction of capitalism and leads to economic crisis and the breakdown of capitalism. But O'Connor equally emphasizes a second contradiction within capitalism, that between production and the environmental conditions of production (Figure 6.2). Marx and Engels used the term conditions of production to encompass human resources (labor), natural resources, and space. In ecological Marxist theory, these conditions of production come into conflict with the forces/relations of production. This second contradiction of capitalism leads to eco-economic crisis, initiating the transition to ecological socialism.¹⁷

Ecology is the basis of three conditions of production. First are the external physical conditions, what Marx called the natural elements entering into capital. Examples are the health and viability of ecosystems, such as the adequacy and stability of wetlands and the quality of soils, waters, and air. Second are the personal conditions of the laborers. Examples are the health of workers, as affected by the environment. Toxics and pesticides in the workplace, smoggy air and polluted water, unpleasant surroundings in the work environment, all affect the well-being of workers. Third are the social conditions of production, such as the means of communication among workers and managers.



In traditional Marxist theory, the first contradiction of capitalism leads to overproduction of goods. There is a decreased demand among consumers for the product. In ecological Marxist theory, however, the second contradiction of capitalism leads to underproduction. Capitalism creates its own barriers to growth by destroying its own environmental conditions of production. Ecologically destructive methods of agriculture, forestry, and fishing raise the costs of raw materials that lead to the underproduction of goods and the underproduction of capital. Soils are depleted, waters are polluted, workers' health fails, yields of produce, meat, wood, and textiles decline. In its hunger for profits, capitalism thus destroys its own ecological conditions of production. Rather than leaving nature free and autonomous, capitalism recreates it as capitalized nature—a second nature treated as commodity and subjected to ecological abuse.

In traditional Marxism, the agencies of social transformation are the traditional labor and socialist movements that change the relations of production, through collective bargaining for example. Here economic crises make it possible to imagine the transition to socialism. In ecological Marxism, instead, the agencies of social transformation are the new ecological social movements: environmental health and safety, farm-workers' anti-pesticide coalitions, ecofeminist protests over groundwater toxins, left-wing green parties, and so on. Here it is ecological crises that make it possible to imagine the transition to socialism. Such crises and social movements push capitalism to respond in more transparently social and potentially socialist ways. In turn, capitalism responds by introducing more environmental and natural resources planning—sustained yield forests, environmental health policies, toxic waste disposal practices, and so on.

But in imagining the transition to an ecological socialism, socialist ecology criticizes state socialism, arguing that this is not what the new vision entails. State socialist societies have created ecological crises and fostered ecologically destructive policies, as have capitalist societies. Their planning processes nationalize production rather than democratizing and socializing it. They stifle individual creativity and are bureaucratically inflexible. They abuse and deplete nature as do capitalist societies, but do so not because of the profit-motive, but because their commitment to full employment stifles appropriate technologies and permits pollution.¹⁸

Figure 6.2 Socialist Ecology

Source: Diagram by Yaakov Garb based on James O'Connor, "Capitalism, Nature, Socialism: A Theoretical Introduction," 1 (Fall 1988): 11-38 (as modified by James O'Connor in *Natural Causes: Essays in Ecological Marxism* (New York: Guilford Press, 1998), 172, used by permission.

In an ecological socialist society, nature will be recognized as autonomous, rather than humanized and capitalized. Ecological diversity, an ecological sensibility, and a science of survival based on the interrelatedness of living organisms and the environment will all be needed and valued.

What is an example of such an ecology of survival? One such case history is the use of biological insect controls in Nicaragua. Before the Nicaraguan revolution of 1979, agricultural production was dependent on heavy applications of pesticides to produce high cotton exports. Broad spectrum chemicals destroyed natural insect enemies, created new chemically-resistant pests, and caused high numbers of pesticide poisonings among workers. A pesticide treadmill set in, in which a cotton export economy became dependent on increasing amounts of pesticides to maintain yields, fueling the profits of foreign chemical companies. After the overthrow of the Somoza regime, the new socialist government stepped up the use of Integrated Pest Management (IPM) techniques and revolutionized the forces of production.

IPM uses biological methods of controlling insect pests as its core. It depends on the careful monitoring of pest levels by trained field aides who assess when the economic threshold of pest damage has been reached, as opposed to spraying broad spectrum chemicals on predetermined calendar dates. Pesticides are applied only in limited amounts and in narrow ranges. Plants are cut and plowed under the soil between seasons to avoid carryover of pests. Before the Sandinista revolution, regional IPM programs had been difficult to implement because not all capitalist growers in an area cooperated. The restructuring of farms under the new government created new relations of production which allowed new forces of production such as IPM to take root. These new productive forces fostered better conditions of production by improving both the health of the soil and the health of the workers. The government was able better to plan production, train IPM field hands, save on the enormous costs of pesticides, and achieve higher yields. IPM as a force of production creates independence, as opposed to chemical-company dependence, and creates jobs for field workers. IPM continued to be used in Nicaraguan agriculture after the defeat of the Sandinistas in the elections of 1990, 1996, and 2001. Funding from outside the country allows external monitoring and evaluation of the method. Thus, despite increasing dependence on world markets and politics the Sandinista contributions to IPM have achieved some successes.¹⁹

DIALECTICAL BIOLOGY

Does social ecology go beyond applied sciences, such as IPM, to include scientific method itself? In *The Dialectical Biologist*, Richard Levins and Richard Lewontin argue that science done in the style of Marx and Engels is based on different assumptions than those of mechanistic science. Whereas mechanism is Cartesian, reductionist, and positivist (i.e., based solely on the validity of empiricism and mathematics), a dialectical perspective on science emphasizes change, historicity, and social construction. What is accepted as knowledge in any given period changes over time. What is socially and politically acceptable in any given society sets the goals and parameters of scientific investigation.

Dialectical science is based on four assumptions about the nature of reality. First, the whole is a relation among parts, rather than a sum of basic elements. These parts do not exist apart from the whole, but only in relation to it. Second, the properties take their meaning from the whole. They exist only in interaction with it. A person acquires the property of flying only in relation to a social-technological system of aluminum extraction and construction, petroleum, and pilots. Third, parts and wholes interpenetrate. Causes become effects, subjects become objects and vice versa. The environment shapes the individual and the individual shapes the environment. Both nature and people are actors in the making of history. Fourth, change is primary. It is the fundamental constant. Stability is only a momentary balance. In every object there are oppositions and contradictions that bring about change. Harmony, stability, balance, stasis, equilibrium, adaptation, and so on are illusions. Even the so-called fundamental constants of science, such as the mass of the electron and Plank's constant may change slowly over eons. If so, present assumptions about the origin and evolution of the universe could be seriously challenged.

To say that science is socially constructed is to recognize that scientists, like everyone else, bring to their work a set of assumptions about the world. While scientists try to be explicit about the mathematical and empirical assumptions and the laws that underlie their scientific papers, they are influenced by other implicit assumptions about society and the world that help to determine the kinds of research problems that are investigated and funded. The results of their research make up the theoretical basis of ongoing scientific investigations. What scientists see, hear, and attend to is influenced by a prior set of ideological beliefs. "Knowledge is socially constructed," according

to Levins and Lewontin, "because our minds are socially constructed and because individual thought only becomes knowledge by a process of being accepted into social currency."²⁰

Mechanistic science deals with a very small number of the possible relationships that exist in the world. It attempts to explain observable phenomena in terms of small hidden parts (atoms and molecules) as underlying causes. Dialectical science by contrast does not presuppose a hierarchy of parts and causes. How one divides up the whole depends on the particular problem. Ecology looks at interactions among parts of a community rather than setting up hierarchies among higher and lower forms. A given species such as a migrating bird or caribou may be a part of several different communities at different times.

In a dialectical worldview, objects of natural laws become subjects that may change the apparently constant laws themselves. For example, the origin of life from inanimate matter changed the law which enabled life to originate because living organisms converted the atmosphere from a reducing to an oxygen-rich atmosphere. Mechanistic science separates internal from external causes, holding one constant while changing the other. Thus the environment triggers changes in the organism, as does a living thing as it adapts to environmental change. Or conversely, an internal change initiates development as in the case of an embryo. A dialectical approach looks at the effects of both environment and genetic make up together.

Dialectical science considers change as a tension between opposites. Thus in predator-prey relationships, the process of predation is propelled by the death rate of the prey and the birthrate of the predator, and vice versa. The interaction between the two opposites causes fluctuations in population. As change occurs the initial conditions change. Levins and Lewontin maintain that contradictions in nature are not only political, but ontological, that is fundamental to being itself. "Opposing forces lie at the basis of the evolving physical and biological world. Things change because of the actions of opposing forces on them, and things are the way they are because of the temporary balance of opposing forces." Rather than change, it is stability and equilibrium that bear explanation. Opposing processes regulate and stabilize an object, as when blood sugar rises in response to sugar ingested or falls with the release of insulin from the pancreas. Similarly, blood pressure is regulated by processes in the kidneys. In each case, opposing forces mutually regulate each other to achieve homeostasis.²¹

CRITIQUES OF SOCIAL ECOLOGY

Social ecology is criticized by deep ecologists for its ponderous and, to some, outdated Marxist theory, for its failure to offer any analysis of a transpersonal or ecological self, and for its lack of any realistic scientific alternatives based on dialectics. To imagine a history or science explained by dialectical processes is not only naive and outdated, but ignores empirical reality in favor of an idealized teleological trajectory. To spiritual ecologists, social and socialist ecologies fail to offer anything beyond the immediate fulfillment of economic and material needs and even denigrate spiritual needs. Despite the contributions of social and socialist ecofeminists (see chapter 8), social ecologies seem to some critics to lack an analysis of socially constructed gender differences or workable proposals for overcoming gender/environment problems.

To some ecophilosophers, both social and socialist ecologists assume an idealized Golden Age absolving early peoples of violence, hierarchy, and competition and imbuing them with an unverifiable egalitarian social harmony and ecological balance not borne out by anthropological or ecological research. Such assumptions impose on history a narrative of decline from an idealized past and set up a hoped for reclamation of lost ideals through a doomed and unrealistic class struggle. Marx, as well as social and socialist ecologists, frame their proposals within a larger narrative of fall and redemption. Joel Kovel argues that there are really two narratives in Bookchin's (and other Marxists') work. In the case of Bookchin, the first narrative is social ecology's public discourse based on the emergence of hierarchy and its dissolution. The second is a retelling of the legend of the Fall and redemption (the master mythos of the Judeo-Christian tradition), in which humanity awaits its redeemer, now called the Anarchist (or Marxist) who suffers persecution and criticism. By preaching the self creativity of nature and freedom from social hierarchy, the Anarchist liberates both nature and humanity.²²

According to David Watson (alias George Bradford see chapter 4), Bookchin bases his ideas on a progressive vitalism. His underlying assumption is that: "a nature rendered self-conscious means a natural world guided by human rationality toward the balance of harmonious ecological as well as social ends." This kind of evolution has a clear directionality built into it that is not borne out by science and is criticized by scientists who have argued for randomness in evolutionary processes (such as Steven J. Gould in *Wonderful*

Life, 1989). If there is no striving or directionality toward human emergence as self-consciousness, then Bookchin's framework is undercut.²³

Nor have social ecologists given adequate attention to environmental ethics. They have not shown how a basically homocentric ethic oriented toward social justice can also be sensitively informed by ecological principles. They have not given sufficient credence to an ecocentric ethic that gives moral considerability to nonhuman nature. Multicultural and partnership ethics, however, offer possibilities for combining social ecology's wider goals of social justice and gender equality with ecological processes. Likewise, the contributions of Chaia Heller and Ynestra King to social ecology and of Mary Mellor and Ariel Salleh to socialist ecology deepen their gender analyses (see chapter 8). The debates among these various camps of radical ecologists, however, are important, as they push each other to rethink and reevaluate their own proposals for change.

CONCLUSION

Social ecology emphasizes the human implications of systems of economic production on the environment. Both capitalism and state socialism produce externalities that disrupt nature. Social ecology envisions a world in which basic human needs are fulfilled through an economic restructuring that is environmentally sustainable. While social ecologists would like to see world population stabilize at a level that is compatible with environmental sustainability, they deplore any programs that result in genocide, racism, or callous disregard for human rights in bringing about a demographic slowdown. Instead, economic programs that provide for basic needs, healthcare, security in old age, and employment are the pathways that will bring about a demographic transition in developing countries and equalize the quality of life in both developed and developing countries. Finally, social ecology advocates a science oriented toward social values and the recognition of change, rather than stability, as the basic premise on which to understand the natural world. It is similar to deep ecology in calling for a major transformation in world-views and a process-oriented science, but differs from it in its emphasis on the human condition, the economic basis of transformation, and a homocentric as opposed to an ecocentric ethic. The ideas of deep, spiritual, and socialist ecologists find expression through the movements discussed in Part III.

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