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Author(s): Timothy W. Luke
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On Environmentality: Geo-Power and Eco-Knowledge in the Discourses of Contemporary Environmentalism

Timothy W. Luke

This study examines how discourses of nature, ecology, or the environment, as disciplinary articulations of "eco-knowledge," might be reinterpreted as efforts to generate systems of "geo-power" over, but also within and through, Nature for the governance of modern economies and societies. The thinking of Michel Foucault, particularly his notions of sexuality and bio-power as mediations for discursively formed discipline, provides a basis for this reinterpretation, because many of the terms associated with "the environment" are perplexing until one puts them under a genealogical lens. These dynamics have been at play for nearly a hundred and thirty years—or at least since self-consciously ecological discourses were formulated by George Marsh (1885) or Ernst Haeckel (1866) in the nineteenth century—but their operations are particularly apparent today.

While many examples of such tendencies might be mobilized here, this examination of geo-power systems as a mediation of

environmentality will center upon only one—the work of the Worldwatch Institute. The continuous attempt to reinvent the forces of Nature in the economic exploitation of advanced technologies, linking structures in Nature to the rational management of its energies as geo-power, is an ongoing supplement to the disciplinary construction of various modes of bio-power in promoting the growth of human populations (Foucault, *History of Sexuality* I 140–41). Directed at generating geo-power from the more rational insertion of natural and artificial bodies into the machinery of production, discourses of environmentality can be seen fabricating disciplinary environments where power/knowledge operate as ensembles of geo-power and eco-knowledge.

In and of itself, Nature arguably is meaningless until humans assign meanings to it by interpreting some of its many signs as meaningful (Bramwell, Eckersley). The outcomes of this activity, however, are inescapably indeterminate. Because different human beings will observe its patterns, choosing to accentuate some while deciding at the same time to ignore others, Nature's meanings always will be multiple and unfixed. Only these interpretive acts can construct contestable textual fields, which can then be read on various levels of expression for their many manifest or latent meanings. Before technologies turn its matter and energy into products, Nature already is transformed discursively into "natural resources." And, once it is rendered intelligible through these discursive processes, it can be used to legitimize almost anything. Therefore, this analysis will look into the discursive uses and conceptual definitions of some common theoretical notions, like "the environment," "environmentalism," and "environmentalist," to reconsider how many contemporary environmentalists are giving a new look to "the environment," as a concept, by transforming its identity in the practices of "environmentality." Finally, as these preliminary navigational bearings indicate, doubts are raised here about the apparently benign intentions of environmental actions, given the disciplinary propensities of the practices embedded in this new regime of environmentality.

For more concrete evidence to justify such caution, this study of geo-power and eco-knowledge will look at the work of the Worldwatch Institute. Established in 1974 amidst the economic and political panic sparked by the OPEC oil crisis of 1973, the

Worldwatch Institute might be dismissed as just another nest of D.C. policy wonks, turning out position papers on water scarcity, reforestation, windmill economics, and overpopulation. This image of the Worldwatchers is accurate, but incomplete. And, given this incompleteness, worldwatching ought not to be quickly ignored or easily dismissed. Such activities can be the essence of power/knowledge formation, because much of what policy wonks do basically boils down to defining, creating, and enforcing discursive regimes of disciplinary truth. Consequently, this analysis carefully re-reads one recent Worldwatch Institute publication, *Saving the Planet: How to Shape an Environmentally Sustainable Society* (1991) by Lester Brown, Christopher Flavin, and Sandra Postel, to illustrate how the eco-knowledge generated by the Worldwatch Institute might be seen as a mediation of environmentality in a new regime of geo-power.

1. Eco-Diction: Making Nature Speak as "Environment"

Many individuals who are intent upon turning the world into "a better place to live" often turn today to "the environment" in order to make their improvements. Believing that they must do anything and everything to protect "the environment," they transform this undertaking into a moral crusade. Their struggles, however, are often hobbled by a fundamental lack of clarity about what "the environment" actually *is*. This lack of certainty or centeredness in the meaning of environments is intriguing, because so many contemporary ecological discourses articulate their visions of moral value, political organization, and social control by stressing the salience of solving "environmental problems" for contemporary society.

"Environment," "environmentalism," and "environmentalist" are words used and accepted so broadly now that it is difficult to remember how recently they came into such wide currency. Before 1965, their use in ordinary discussions actually was quite rare in most policy discourses. More suggestive terms, like "Nature," "conservation," or "ecology," typically were deployed in making references about the characteristics of the environmental. Now, a generation later, in the 1990s, Nature in these discourses occasionally

will speak as "Nature," but increasingly its presence is marked as "the environment." This twist is interesting inasmuch as the various meanings of Nature, while remaining fully contestable, are somewhat clearer than a generation ago. At the same time, the meanings of the "environment," which are essentially uncontested, remain very unclear. Documenting this shift in usage is not an exact practice, but to start, one might look briefly through newspaper indices or expert discourses to develop a sense of the shift.

In 1960, or the year Rachel Carson's *New Yorker* essays on how pesticides were despoiling wildlife first drew broad public attention, there is only one story in *The New York Index* about environmental science, and it ties the topic to "astronautics." Five years earlier, in 1955, the word is not even registered in the index, but by 1965 there are four entries about "the environment," one of them about a speech by President Johnson on the need for greater efforts at conservation and beautification in preserving the environment. By 1970, there are almost two and a half entire pages of citations. And, more importantly, the concept remains a significant feature in the index during every year after 1970: one and two-thirds pages in 1975, one and a third in 1980, two pages in 1985, and three and a third in 1990. Even though increasing attention is being allotted in *The New York Times* to concerns that are broadly labeled as "environmental" or "environmentalistic," what "the environment" means to the press is much less clear. It encompasses Nature, conservation, and ecology as well as pollution, deforestation, and contamination.

Despite all of the talk about its central importance, "the environment" constantly escapes exacting definition, even in expert "environmentalist" discourses (Worster). For almost any given ecological writer, the significance of the environment and environmentalism is now apparently assumed to be so obvious that precise definitions are superfluous. ReVelle and ReVelle in their text *The Environment: Issues and Choices for Society* (1988), for example, name their book after the environment, but they fail to include any definition of what it means in their book's glossary or analysis. Buchholz in *Principles of Environmental Management: The Greening of Business* (1993) does not define the environment as a vital concept in ecology, even though he recounts standard dictionary definitions, presenting it as the surroundings that are natural organisms'

ecological settings (29–30). When the environment is defined by experts, it basically encompasses everything. Nebel, for example, in his *Environmental Science: The Way the World Works* (1990) follows this fashion by identifying the environment as "the combination of all things and factors external to the individual or population of organisms in question" (576). Given such nonexistent, derivative, or vague understandings of the environment, it becomes more interesting as to how and why "Nature," "the biosphere," or all "ecological systems" easily can circulate as conceptual equivalents in rough-and-ready exchange as a loose understanding of what "the environment" might mean.

Interestingly, this tendency also marks the work of explicitly political analyses of the environment (Paehlke). Even Barry Commoner, whose political thinking on environmental problems from the 1960s through the 1990s has won wide respect, takes this analytical path. Commoner does not directly confront the concept of the environment; instead, he divides Nature into "two worlds: the natural ecosphere, the thin skin of air, water, and soil and the plants and animals that live in it, and the man-made technosphere," which now has become

> sufficiently large and intense to alter the natural processes that govern the ecosphere. And in turn, the altered ecosphere threatens to flood our great cities, dry up our bountiful farms, contaminate our food and water, and poison our bodies—catastrophically diminishing our ability to provide for basic human needs. (*Making Peace* 7)

Ultimately, Commoner depicts these two worlds as being "at war." As humans in the technosphere disrupt the ecosphere, the ecosphere responds with equally or more disruptive secondary effects in the technosphere. In some sense, the environment is "Nature" for Commoner, but it is also "Society," or, more accurately, Nature-as-transformed-by-Society. The prospect of something like "geo-power," in turn, is foreshadowed by expert intellectual interventions typified by his critiques. In fact, geo-power might be seen as the means of productively fusing the technosphere with the biosphere through the right codes of eco-knowledge. He stresses this interpretation in *The Closing Circle* (1971) when he claims "the envi-

ronment is, so to speak, the house created on the earth *by* living things, *for* living things" (32). This representation of the environment as life's house, however, does little more than reduce it to a biophysical housing of all living things—or, again, the setting that surrounds organisms. Hence, environmentalism becomes the practice of running this house created by living things for living things more rationally or justly.

This curious absence of clear definition can be tracked back beyond Commoner to Carson's original call for greater environmental awareness. *Silent Spring,* as it appeared in *The New Yorker* in 1960, and as a book in 1962, largely directed its analysis at "the web of life" rather than "the environment." Still, in reexamining how unregulated application of chemical pesticides adversely affected biotic communities in the world's overlapping and interconnecting food chains, Carson constructed a provisional reading of "the environment." That is, some substances from the technosphere (chemical pesticides) were invented to kill something in the biosphere (animal pests). While their application was intended to control only those animals that ate crops, carried disease, and infested dwellings, their impact was much broader. Pesticides soon spread through everything in the ecosphere—both human technosphere and nonhuman biosphere—returning from the "out there" of natural environments back into plant, animal, and human bodies situated at the "in here" of artificial environments with unintended, unanticipated, and unwanted effects. By using zoological, toxicological, epidemiological, and ecological insights, Carson generated a new sense of how "the environment" might be seen. However, she never based her analysis directly upon a formalized notion of "the environment" or "environmental damage."

Of course, any concept, like "the environment," "environmentalism," or "environmentalist," can be deployed as indistinctly as all of these patterns of use indicate. In noting how the words are used, one sees what we might ordinarily expect: namely, that they tend to mean various things to many people in several different contexts. Another approach to the problem would be to develop a provisional genealogy of the term's early origins to reveal other more embedded understandings of "the environment" that could be more suggestive than the sense of "environment" which

encompasses *all* surroundings, *every* factor that affects organisms, the *totality* of circumstances, or the *sum* complex of conditions. A return to the semantic origins of environment, then, might illuminate some of these ambiguities and clarify how environmentalistic concepts actually work in the present.

2. On Environing

The separation of organisms from their environments is the primary epistemological divide cutting through reality in the rhetorics of ecology. This discursive turn goes back to Haeckel's initial 1866 identification of ecology as the science that investigates all of the relations of an organism to its organic and inorganic environments. Nonetheless, there are differences among ecologists over what these "environments" might be. Because the expanse of the organic and inorganic environment is so broad, it often is defined in terms delimiting what it *is* by looking at what it *is not*. In other words, it is the organism, or biotic community, or local ecosystem that ecologists place at the center of their systems of study, while the environment is reduced to everything outside of the subject of analysis. With these maneuvers, environments are often transformed rhetorically into silences, backgrounds, or settings. In this manner, they also are studied and understood not directly as such, but more indirectly in terms of the objective relations and effects they register upon the subjects of study they surround.

Even so, this inversion of *one* thing, like an organism or society, into *everything*, or the environment, might disclose the nature of the environment only in relation to this one thing. After all, environmental analysis must reduce "everything" to measures of "anything" available for measurement (like temperature levels, gas concentrations, molecular dispersions, resource variations, or growth rates) to track variations in "something" (like an organism's, a biome's, or a river's responses to these factors). But is it "the environment" that is being understood here, or is its identity being evaded in reducing it to a subset of practicable measurements? Does this vision of "environment" really capture the actual quality or true quantity of all human beings' interrelations with all of the terrains, waters, climates, soils, architectures, technologies,

societies, economies, cultures, or states surrounding them? In its most expansive applications, then, the environment becomes a strong but sloppy force: it is anything out there, everything around us, something affecting us, nothing within us, but also a thing upon which we act. Despite its formal definitions, however, the environment is not, in fact, everything. Many environmental discourses look instead at *particular* sites or at *peculiar* forces. The discursive variations and conceptual confrontations of the "environment" really begin to explode when different voices accentuate this or that set of things in forming their environmental analysis. On the one side, they may privilege forces in the ecosphere, or, on the other side, they might stress concerns from the technosphere. But in either case, each rhetoric which operates as an agency protecting "the environment" struggles to site "the environmental" as a somewhere affected by or coming from everything.

Perhaps the early origins of "the environment" as a concept—its historical emergence and original applications—might prove more helpful. In its original sense, which is borrowed by English from Old French, an environment is an action resulting from, or the state of being produced by a verb: "to environ." And environing as a verb is, in fact, a type of strategic action. To environ is to encircle, encompass, envelop, or enclose. It is the physical activity of surrounding, circumscribing, or ringing around something. Its uses even suggest stationing guards around, thronging with hostile intent, or standing watch over some person or place. To environ a site or a subject is to beset, beleaguer, or besiege that place or person.

An environment, as either the means of such activity or the product of these actions, now might be read in a more suggestive manner. It is the encirclement, circumscription, or beleaguerment of places and persons in a strategic disciplinary policing of space. An environmental act, in turn, is already a disciplining move, aimed at constructing some expanse of space—a locale, a biome, a planet as biospherical space, or, on the other hand, some city, any region, the global economy in technospherical territory—in a discursive envelope. Within these enclosures, environmental expertise can arm environmentalists who stand watch over these surroundings, guarding the rings that include or exclude forces, agents, and ideas.

If one thinks about it, this original use of "the environment" is an accurate account of what is, in fact, happening in many environmental practices today. Environmentalized places become sites of supervision, where environmentalists see from above and from without through the enveloping designs of administratively delimited systems. Encircled by enclosures of alarm, environments can be disassembled, recombined, and subjected to the disciplinary designs of expert management. Enveloped in these interpretive frames, environments can be redirected to fulfill the ends of other economic scripts, managerial directives, and administrative writs. Environing, then, engenders "environmentality," which embeds instrumental rationalities in the policing of ecological spaces.

3. Environmentality and Governmentality

These reflections on "the environment" reframe its meanings in terms of the practices of power, allowing us to turn to Michel Foucault for additional insight. The bio-power formation described by Foucault was not historically closely focused upon the role of Nature in the equations of biopolitics (Foucault, *History of Sexuality* I 138–42). For Foucault, the whole point of the controlled tactics of inserting human bodies into the machineries of industrial and agricultural production as part and parcel of strategically adjusting the growth of human populations to the development of industrial capitalism was to bring "life and its mechanisms into the realm of explicit calculations," making the disciplines of knowledge and discourses of power into many agencies as part of the "transformation of human life" (143). Once this threshold of bio-power was crossed, human economics, politics, and technologies continually placed all human beings' existence into question.

Foucault notes that these industrial transformations implicitly raised ecological issues as they disrupted and redistributed the understandings provided by the classical episteme of defining human interactions with Nature. Living became "environmentalized," as humans related to their history and biological life in new ways from within growing artificial cities and mechanical modes of production, which positioned this new form of human being "at the same time outside history, in its biological environment, and inside

human historicity, penetrated by the latter's techniques of knowledge and power" (143). Here we can begin to locate the emergence of "the environment" as a nexus for knowledge formation and as a cluster of power tactics. As human beings began to consciously wager their life as a species on the outcomes of these biopolitical strategies and technological systems, it became clear that they also were wagering the lives of other (or all) species as well. While Foucault regards this shift as one of many lacunae in his analysis, it is clear there is much more going on here than he realizes. Once human power/knowledge formations become the foundation of industrial society's economic development, they also become the basis for the physical survival of all terrestrial life forms. Here, ecological analysis emerges as a productive power formation that reinvests human bodies—their means of health, modes of subsistence, and styles of habitation integrating the whole space of existence—with bio-historical significance by framing them within their various bio-physical environments filled with various animal and plant bodies.

Foucault can be read as dividing the environment into two separate, but interpenetrating spheres of action: the biological and the historical. For most of human history, the biological dimension, or forces of Nature working in the forms of disease and famine, dominated human existence with the ever-present menace of death. Developments in agricultural technologies as well as in hygiene and health techniques, however, gradually provided some relief from starvation and plague by the end of the eighteenth century. As a result, the historical dimension began to grow in importance as "the development of the different fields of knowledge concerned with life in general, the improvement of agricultural techniques, and the observations and measures relative to man's life and survival" averted some of the imminent risks of death (142). In other words, "the historical" starts to envelop, circumscribe, and surround "the biological." Hence, environmentalized settings emerged "in the space of movement thus conquered, and broadening and organizing that space, methods of power and knowledge assumed responsibility for the life processes and undertook to control and modify them" (142). While he does not explicitly define these spaces, methods, and knowledges as such as being "environmental," it appears that such maneuvers were cru-

cial to the emergence of environmentalization. As biological existence was refracted through economic, political, and technological existence, "the facts of life" passed into fields of control for eco-knowledge and spheres of intervention for geo-power.

Environments then emerged with bio-power as part and parcel of the regulation of life via biopolitics, and, for nearly a century, ecology apparently remained another ancillary correlate of bio-power, inhabiting discourses about species extinction, resource conservation, and overpopulation. Until the productive regime of biopolitics became fully globalized (because Nature itself is not entirely encircled), ecology was a fairly minor voice in the disciplinary chorus organizing development and growth. Things changed, however, once the extensive expansionist strategies of development and growth employed in the eighteenth and nineteenth centuries collapsed around 1914, promoting conservationist ethics in Europe and North America that fretted over conserving resources for resource-driven intensive modes of production. And, as new mediations of development and growth were constructed after 1945, the geo-power/eco-knowledge nexus of environmentalization came to comfortably supplement the high technology, capital intensive development strategies that have since been implemented.

Thus, the environment, if one follows Foucault's line of reasoning (105–06), must not be understood as the naturally given sphere of ecological processes which human powers try to keep under control, nor should it be viewed as a mysterious domain of obscure terrestrial events which human knowledge works to explain. Instead, it emerges as a historical artifact that is openly constructed, not an occluded reality that is difficult to comprehend. In this great network, the simulation of spaces, the intensification of resources, the incitement of discoveries, the formation of special knowledges, the strengthening of controls, and the provocation of resistances can all be linked to one another.

The immanent designs of Nature, when and where they are "discovered" in environments, closely parallel the arts of government. One might ask if the two are not inseparable in geo-power/eco-knowledge systems. As Foucault sees the arts of government, they essentially are concerned with how to introduce economy into the political practices of the state. Government becomes in the

eighteenth century the designation of a "level of reality, a field of intervention, through a series of complex processes" in which "government is the right disposition of things" ("Governmentality" 93). Governmentality applies techniques of instrumental rationality to the arts of everyday management. It evolves as an elaborate social formation, or "a triangle, sovereignty-discipline-government, which has as its primary target the population and as its essential mechanism the apparatuses of security" (102).

Most significantly, Foucault sees rulers and authorities mobilizing governmentality to bring about "the emergence of population as a datum, as a field of intervention and as an objective of governmental techniques" (102) so that now "the population is the object that government must take into account in all its observations and *savoir,* in order to be able to govern effectively in a rational and conscious manner" (100). The networks of continuous, multiple, and complex interaction between populations (their increase, longevity, health), territory (its expanse, resources, control), and wealth (its creation, productivity, distribution) are sites of governmentalizing rationality to manage the productive interaction of these forces.

Foucault invites social theorists not to reduce all ensembles of modernizing development to the "statalization" of society wherein "the state" becomes an expansive set of managerial functions, discharging its effects in the development of productive forces, the reproduction of relations of production, or the organization of ideological superstructures. Instead he argues in favor of investigating the "governmentalization" of the economy and society whereby individuals and groups are enmeshed within the tactics and strategies of a complex form of power whose institutions, procedures, analyses, and techniques loosely manage mass populations and their surroundings in a highly politicized symbolic and material economy (103). Because governmental techniques are the central focus of political struggle and contestation, the interactions of populations with their natural surroundings in highly politicized economies compel states constantly to redefine what is within their competence throughout the modernizing process. To survive after the 1960s in a world marked by decolonization, global industrialization, and nuclear military confrontation, it is not enough for states merely to maintain legal jurisdiction over their allegedly

sovereign territories. As ecological limits to growth are either discovered or defined, states are forced to guarantee their populations' fecundity and productivity in the total setting of the global political economy by becoming "environmental protection agencies."

Governmental discourses methodically mobilize particular assumptions, codes, and procedures in enforcing specific understandings about the economy and society. As a result, they generate "truths" or "knowledges" that also constitute forms of power with significant reserves of legitimacy and effectiveness. Inasmuch as they classify, organize, and vet larger understandings of reality, such discourses can authorize or invalidate the possibilities for constructing particular institutions, practices, or concepts in society at large. They simultaneously frame the emergence of collective subjectivities (nations as dynamic populations) and collections of subjects (individuals) as units in such nations. Individual subjects as well as collective subjects can be reevaluated as "the element in which are articulated the effects of a certain type of power and the reference of a certain type of knowledge, the machinery by which the power relations give rise to a possible corpus of knowledge, and knowledge extends and reinforces the effects of this power" (Foucault, *Discipline and Punish* 29). Therefore, an environmentalizing regime must advance eco-knowledges to activate its command over geo-power as well as to re-operationalize many of its notions of governmentality as environmentality. Like governmentality, the disciplinary articulations of environmentality must center upon establishing and enforcing "the right disposition of things."

4. Green Governmentality as Resource Managerialism

The script of environmentality embedded in new notions like "the environment" is rarely made articulate in scientific and technical discourses. Yet, there are politics in these scripts. The advocates of deep ecology and social ecology dimly perceive this in their frustrations with "reform environmentalism," which weaves its logics of geo-power in and out of the resource managerialism that has defined the mainstream of contemporary environmental protec-

tion thinking and traditional natural resource conservationism (Luke, "Green Consumerism"). Resource managerialism can be read as the eco-knowledge of modern governmentality. While voices in favor of conservation can be found in Europe early in the nineteenth century, the real establishment of this stance comes in the United States with the Second Industrial Revolution from the 1880s through the 1920s and the closing of the Western Frontier in the 1890s (Noble). Whether one looks at John Muir's preservationist programs or Gifford Pinchot's conservationist codes, an awareness of modern industry's power to deplete natural resources, and hence the need for systems of conservation, is well established by the early 1900s (Nash, *Wilderness*). President Theodore Roosevelt, for example, organized the Governor's Conference in 1907 to address this concern, inviting the participants to recognize that the natural endowments upon which "the welfare of this nation rests are becoming depleted, and in not a few cases, are already exhausted" (Jarrett 51).

Over the past nine decades, the fundamental premises of resource managerialism have not changed significantly. In fact, this code of eco-knowledge has only become more formalized in bureaucratic applications and legal interpretations. Paralleling the managerial logic of the Second Industrial Revolution, which empowered technical experts on the shop floor and professional managers in the main office, resource managerialism imposes corporate administrative frameworks upon Nature in order to supply the economy and provision society through centralized state guidance. These frameworks assume that the national economy, like the interacting capitalist firm and household, must avoid both overproduction (excessive resource use coupled with inadequate demand) and underproduction (inefficient resource use in the face of excessive demand) on the supply side as well as overconsumption (excessive resource exploitation with excessive demand) and underconsumption (inefficient resource exploitation coupled with inadequate demand) on the demand side.

To even construct the managerial problem in this fashion, Nature must be reduced—through the encirclement of space and matter by national as well as global economies—to a cybernetic system of biophysical systems that can be dismantled, redesigned, and assembled anew to produce "resources" efficiently and in ade-

quate amounts when and where needed in the modern marketplace. In turn, Nature's energies, materials, and sites are redefined by the eco-knowledges of resource managerialism as the source of "goods" for sizable numbers of some people, even though greater material and immaterial "bads" also might be inflicted upon even larger numbers of other people who do not reside in or benefit from the advanced national economies that basically monopolize the use of world resources at a comparative handful of highly developed regional and municipal sites. Many of these eco-knowledge assumptions and geo-power commitments can be seen at work in the discourses of the Worldwatch Institute as it develops its own unique vision of environmentality for a global resource managerialism.

5. New Power/Knowledge

The Worldwatch Institute provides a curious instantiation of how regimes of environmentality might be seen at work in the processes of developing a geo-power/eco-knowledge formation. Taking the world as one ecological site, the Worldwatch Institute aptly typifies a green power/knowledge center in the play of current-day environmental politics. Seeing the path of untrammeled industrial development as the cause of environmental crises, a recent Worldwatch Institute book by Brown, Flavin, and Postel attributes the prevailing popular faith in material growth to "a narrow economic view of the world" (21). Any sense of constraint on further growth is cast by economics "in terms of inadequate demand growth rather than limits imposed by the earth's resources" (22). Ecologists, however, study the allegedly complex changing relationships of organisms with their environments, and, for them, "growth is confined by the parameters of the biosphere" (22). For Brown, Flavin, and Postel, economists ironically regard ecologists' concerns as "a minor subdiscipline of economics—to be 'internalized' in economic models and dealt with at the margins of economic planning," while "to an ecologist, the economy is a narrow subset of the global ecosystem" (23). To end this schism, the Worldwatch Institute pushes for melding ecology with economics to infuse environmental studies with economic instrumental ratio-

nality and defuse economics with ecological systems reasoning. Once this is done, the roots of economic growth no longer can be divorced from "the natural systems and resources from which they ultimately derive," and any economic process that "undermines the global ecosystem cannot continue indefinitely" (23).

With this rhetorical maneuver, the Worldwatch Institute articulates its vision of geo-power/eco-knowledge as the instrumental rationality of resource managerialism working on a global scale. Nature, now reinterpreted as a cybernetic system of biophysical systems, reappears among nation-states in those "four biological systems—forests, grasslands, fisheries, and croplands—which supply all of our food and much of the raw materials for industry, with the notable exceptions of fossil fuels and minerals" (Brown, Flavin, and Postel 73). As a result, the performance of these systems might be monitored in analytical spreadsheets written in bioeconomic terms, and then judged in equations balancing increased human population and highly constrained base ecosystem outputs. When looking at these four systems, one must recognize that Nature is merely a system of energy-conversion systems:

> Each of these systems is fueled by photosynthesis, the process by which plants use solar energy to combine water and carbon dioxide to form carbohydrates. Indeed, this process for converting solar energy into biochemical energy supports all life on earth, including the 5.4 billion members of our species. Unless we manage these basic biological systems more intelligently than we now are, the earth will never meet the basic needs of 8 billion people.
>
> Photosynthesis is the common currency of biological systems, the yardstick by which their output can be aggregated and changes in their productivity measured. Although the estimated 41 percent of photosynthetic activity that takes place in the oceans supplies us with seafood, it is the 59 percent occurring on land that supports the world economy. And it is the loss of terrestrial photosynthesis as a result of environmental degradation that is undermining many national economies. (73–74)

Photosynthetic energy generation and accumulation, then, is to become the accounting standard for submitting such geo-power to environmentalizing discipline. It imposes upper limits on eco-

nomic expansion; the earth is only so large. The 41 percent that is aquatic and marine as well as the 59 percent that is terrestrial are actually decreasing in magnitude and efficiency due to "environmental degradation." Partly localized within many national territories and partly globalized as transboundary pollution, the system of systems needs global management—a powerful, all-knowing world watch—to mind its environmental resources.

Such requirements arise from the convergence of dangerous trends identified by such bioeconomic accounting:

> 40 percent of the earth's annual net primary production on land now goes directly to meet human needs or is indirectly used or destroyed by human activity—leaving 60 percent for the millions of other land-based species with which humans share the planet. While it took all of human history to reach this point, the share could double to 80 percent by 2030 if current rates of population growth continue; rising per capita consumption could shorten the doubling time considerably. Along the way, with people usurping an ever larger share of the earth's life-sustaining energy, natural systems will unravel faster. (74)

To avoid this collapse, human beings must stop increasing their numbers so rapidly, halt increasingly resource-intensive modes of production, and limit increasing levels of material consumption. All of these ends require a measure of surveillance and degree of steering beyond the modern nation-state, but perhaps *not* beyond some postmodern worldwatch engaged in the disciplinary tasks of equilibrating the "net primary production" of solar energy fixed by photosynthesis in the four systems. Natural resources in the total solar economy of food stocks, fisheries, forest preserves, and grass lands are rhetorically ripped from Nature only to be returned as environmental resources, enveloped in accounting procedures and encircled by managerial programs. Worldwatching presumes to know all of this, and in knowing it, to have mastered all of its economic/ecological implications through authoritative technical analysis. By questioning the old truth regime of mere economic growth, a new regime of truth for attaining sophisticated ecological economy stands ready to reintegrate human production and consumption in the four biological systems.

The Worldwatch Institute writers here are engaged in a

struggle "for truth" in economic and environmental discourse. By simultaneously framing economics with the bad rap of growth fetishism and twinning ecology with the high purpose of documenting environmental interconnectedness, the Worldwatchers are striving to transform fields of knowledge as bands of power. Inasmuch as today's decentered networks of power operate through relations of truth "linked in a circular relation with systems of power which produce and sustain it, and to effects of power it induces and which extend it" (Foucault, *History of Sexuality* I 144), these discursive alterations are the requisite moves for prevailing in a disciplinary struggle for discursive authority. By shifting the authorizing legitimacy of truth claims used in policy analysis away from *economic* terms to *ecological* terms (as they are cast in these thermodynamic allusions), the Worldwatch Institute's experts are working to reframe the power/knowledge systems of advanced capitalist societies.

6. The Environment as Disciplinary Space

No longer Nature nor even ecosystem, the world under this kind of watch is truly becoming "an environment," ringed by many eco-knowledge centers dedicated to the rational eco-management of its geo-powers. Being "an environmentalist" quickly becomes a power expression of the eco-knowledge formations of environmentality in which the geo-powers of the global ecosystem can be mobilized through the disciplinary codes of green operational planning. The health of global populations as well as the survival of the planet itself allegedly necessitate that a bioeconomic spreadsheet be draped over Nature, generating an elaborate set of accounts for a terrestrial eco-economy of global reach and scope. Hovering over the world in a scientifically centered surveillance machine built out of the disciplinary grids of efficiency and waste, health and disease, poverty and wealth as well as employment and unemployment discourses, Brown, Flavin, and Postel declare "the once separate issues of environment and development are now inextricably linked" (25). Indeed, they are in the discourses of Worldwatch Institute as its organizational expertise surveys Nature-in-crisis by auditing levels of topsoil depletion, air pollu-

tion, acid rain, global warming, ozone destruction, water pollution, forest reduction, and species extinction.

Environmentality, then, would govern by restructuring today's ecologically unsound society through elaborate managerial designs to realize tomorrow's environmentally sustainable economy. The shape of an environmental economy would emerge from a reengineered economy of environmentalizing shapes vetted by worldwatching codes. The individual human subject of today, and all of his or her unsustainable practices, would be reshaped through this environmentality, redirected by practices, discourses, and ensembles of administration that more efficiently synchronize the bio-powers of populations with the geo-powers of environments. Traditional codes defining human identity and difference would be reframed by systems of environmentality in new equations for making comprehensive global sustainability calculations as the bio-power of populations merges with the ecopower of environments. To police global carrying capacity, in turn, this environmentalizing logic bids each human subject to assume the much less capacious carriage of disciplinary frugality instead of affluent suburban consumerism. All of the world will come under watch, and the global watch will police its human charges to dispose of their things and arrange their ends—in reengineered spaces using new energies at new jobs and leisures—around these environing agendas.

Sustainability, however, cuts both ways. On the one hand, it can articulate a rationale for preserving Nature's biotic diversity in order to maintain the sustainability of the biosphere. But, on the other hand, it also can represent an effort to reinforce the prevailing order of capitalistic development by transforming sustainability into an economic project. To the degree that modern subjectivity is a two-sided power/knowledge relation, scientific-professional declarations about sustainability essentially describe a new mode of environmentalized subjectivity. In becoming enmeshed in a worldwatched environ, the individual subject of a sustainable society could become simultaneously "subject to someone else by control and dependence," where environmentalizing global and local state agencies enforce their codes of sustainability, and police a self-directed ecological subject "tied to his own identity by a conscience or self-knowledge" (Foucault, "Afterword" 12). In both manifesta-

tions, the truth regime of ecological sustainability draws up criteria for what sort of "selfness" will be privileged with political identity and social self-knowledge.

Sustainability, like sexuality, becomes a discourse about exerting power over life. How power might "invest life through and through" (Foucault, *History of Sexuality* I 139) becomes a new challenge, once biopolitical relations are established as environmentalized systems. Moreover, sustainability more or less presumes that some level of material and cultural existence has been attained that is indeed worth sustaining. This formation, then, constitutes "a new distribution of pleasures, discourses, truths, and powers; it has to be seen as the self-affirmation of one class rather than the enslavement of another: a defense, a protection, a strengthening, and an exaltation . . . as a means of social control and political subjugation" (123).

The global bio-accounting systems of the Worldwatch Institute conceptually and practically exemplify the project of environmentality with their rhetorics of scientific surveillance. How Nature should be governed is not a purely administrative question turning upon the technicalities of scientific "know-how." Rather, it is essentially and inescapably political. The discourses of Worldwatching that rhetorically construct Nature also assign powers to new global governors and governments, who are granted writs of authority and made centers of organization in the Worldwatchers' environmentalized specifications of managerial "who-can" and political "how-to."

7. Instituting a Worldwatch: The Eco-Panopticon

Not surprisingly, then, the various power/knowledge systems of instituting a Worldwatch environmentality appear to be a practical materialization of panoptic power. The Worldwatch Institute continually couches its narratives in visual terms, alluding to its mission as outlining "an ecologically defined vision" of "how an environmentally sustainable society would look" in a new "vision of a global economy." As Foucault claims, "whenever one is dealing with a multiplicity of individuals on whom a particular form of behavior must be imposed, the panoptic schema may be used"

(*Discipline and Punish* 205) because it enables a knowing center to reorganize the disposition of things and redirect the convenient ends of individuals in environmentalized spaces. As organisms operating in the energy exchanges of photosynthesis, human beings can become environed on all sides by the cybernetic system of biophysical systems composing Nature.

Worldwatching, in turn, refixes the moral specification of human roles and responsibilities in the enclosed spaces and segmented places of ecosystemic niches. And, in generating this knowledge of environmental impact by applying such powers of ecological observation, the institutions of Worldwatch operate as a green panopticon, enclosing Nature in rings of centered normalizing super-vision where an eco-knowledge system identifies Nature as "the environment." The notational calculus of bioeconomic accounting not only can, but in fact must reequilibrate individuals and species, energy and matter, inefficiencies and inequities in an integrated panel of globalized observation. The supervisory gaze of normalizing control, embedded in the Worldwatch Institute's panoptic practices, adduces "the environmental," or enclosed, segmented spaces, "observed at every point, in which the individuals are inserted in a fixed place, in which the slightest movements are supervised, in which all events are recorded, in which an uninterrupted work of writing links the centre and periphery, in which power is exercised without division, according to a continuous hierarchical figure, in which each individual is constantly located, examined, and distributed among the living beings, the sick and the dead" (Foucault, *Discipline and Punish* 197). To save the planet, it becomes necessary to environmentalize it, enveloping its system of systems in new disciplinary discourses to regulate population growth, economic development, and resource exploitation on a global scale with continual managerial intervention.

Many contemporary environmental movements, particularly those inspired by the Worldwatch Institute's analyses, push governmentality to a global rather than a national level of control. The biosphere, atmosphere, and ecosphere are all reintegrated into the truth regime of political economy to serve more ecological ends, but they are also made to run along new economic tracks above and beyond the territorial spaces created by nation-states. By touting the necessity of recalibrating society's logics of governmentality

in new spatial registers at the local and global level, the geo-power politics of environmentality aim to rewrite the geographies of national stratified space with new mappings of bioregional economies knitted into global ecologies—complete with environmentalized zones of "dying forests," "regional desertification," "endangered bays," or "depleted farmland."

If Foucault's representation of governmentality accounts for the practices of power mobilized by centered national sovereigns in the era of capitalist modernization and national state-building after 1648, the Worldwatch Institute's approach to environmentality perhaps foreshadows the practices of power being adduced by multicentric alliances of transnational capital or loose coalitions of highly fragmented local sovereignties, following the collapse of the old Cold War competitions in the early 1990s. New spatial domains are being created in the world today, on the one hand, by pollution, nuclear contamination, and widespread rapid deforestation, and, on the other, by telecommunications, jet transportation, and cheap accessible computerization. Nation-states are not answering effectively the challenges posed within their borders by these new spaces. But a variety of new organizations in the contemporary environmental movement (Luke, "Ecological Politics"), like the Worldwatch Institute, Earth First!, The World Wildlife Federation, or Greenpeace, at least are addressing, if not answering, how these spaces are developing, what impact they have in today's political economy, and who should act to respond to the challenge. In the bargain, they also are interposing their own environmentalizing conceptual maps, technical disciplines, and organizational orders on these spaces as they urge local citizen's groups or global supranational agencies to move beyond the constraints imposed by national sovereignty to construct new sustainable spaces for human habitation.

The cybernetic system of biophysical systems, once known as Nature, has now been reduced to "the environment," so that it might be remapped to police the provinces of photosynthesis and bind the borders of bioeconomics which these spaces constitute. Logics of sovereignty, imposing military-administrative jurisdiction over bits and pieces of these global systems in irrationally drawn territories through governmentality, must be supplanted by larger logics of environmentality. As Fredric Jameson notes, if

these changes can be understood as the historical expression of what is regarded as "postmodern," then this postmodernity must be confronted "since the modernization process is complete and Nature is gone for good" (ix). That is, where the times of modernity end, the spaces of environmentality perhaps begin.

Of course, it is possible to define the environment in codes that are not entirely wound up within the power/knowledge regime of technoscience, like those of the Worldwatch Institute. In their own ways, the discourses of many Earth First! activists, some ecofeminist writers, and a few deep ecology thinkers are working to develop understandings of Nature that stand outside of the bioeconomic accounting standards used by so many mainstream environmental organizations and quite a few radical ecology groups (see Fox; Devall and Sessions; and Nash, *Wilderness*). These alternative discursive frameworks, however, tend to exclude such voices from any effective participation in policy-making (Luke, "Dreams of Deep Ecology"). And, even when some token access might be granted to the members of these movements for registering some policy-related input, their discursive understandings are either pardoned as metaphysical excess or translated into latent policy-relevant prescriptions. Otherwise, the dominant regime of power/knowledge expects its critics, even fairly effective ones like those in the Worldwatch Institute, to accept the technoscientific codes of bureaucratic address which drive environmentality.

In many ways, these contemporary maneuvers to construct an eco-panopticon which re-envisions Nature by environmentalizing its workings as a system of systems can be traced back to the power/knowledge provided in a photographic image (captured initially by the Apollo 8 astronauts) of the Earth in space as it was seen from a NASA spacecraft traveling to the Moon. From its popularization in the 1960s to its banalization in the 1990s, many have put the image to pernicious uses. The dust jacket of another world-watching manifesto, *Earth in the Balance: Ecology and the Human Spirit* (1992) by Vice President Al Gore, continues this practice with its iconic presentation of a composite photograph of a cloudless earth reduced to crystalline perfection by digital photography. Inside the book, Gore walks down many of the Worldwatch Institute's paths in touting the merits of an "eco-nomics" to underpin his visions for a Global Marshall Plan to save "the environment"

with carefully targeted Strategic Environmental Initiatives operated by post–Cold War Washington bureaucracies. Framing the planet in computer-controlled photography serves as his rhetorical pretext for saving the planet through the operations of the green power/knowledge of Gore's "eco-nomic" environmentality.

The pretense of human agency actually engaging in some sort of worldwatch becomes a credible possibility, technologically and administratively, only with this image. Technological power is now so great that even Nature can be reduced to an eco-panoptic snapshot. Armed with the first photos of the earth in space, many people began rethinking their foundational images of the planet in the late 1960s. As the Earth was enveloped for the first time in photography, bringing it under control, into focus, and within reach for ordinary human beings, mythologies changed. For some, the image conveyed the precious fragility of a tiny planet in the immense cosmos. For others, it provided a compelling representation of the world's biggest managerial challenge—generating geo-power via eco-knowledge. Humanity's role must become one of watching over or policing all of the natural systems at work in the skies, oceans, and continents depicted by such photographs as encircled manageable space. Once one can watch the world in eco-panoptic videotapes and photographs, the worldwatching project begins, turning photographic images into political practices and ideological ideals aimed at environing Nature by disciplining its spaces.

Note

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Works Cited

Bramwell, Anna. *Ecology in the 20th Century: A History.* New Haven: Yale UP, 1989.
Brown, Lester, Christopher Flavin, and Sandra Postel. *Saving the Planet: How to Shape an Environmentally Sustainable Global Economy.* New York: Norton, 1991.

Buchholz, Rogene. *Principles in Environmental Management: The Greening of Business.* Englewood Cliffs: Prentice-Hall, 1993.
Carson, Rachel. *Silent Spring.* Boston: Houghton Mifflin, 1962.
Commoner, Barry. *Making Peace with the Planet.* New York: Pantheon, 1990.
———. *The Closing Circle: Nature, Man and Technology.* New York: Knopf, 1971.
Devall, Bill, and George Sessions. *Deep Ecology: Living as if Nature Mattered.* Salt Lake City: Peregrine Smith, 1985.
Eckersley, Robyn. *Environmentalism and Political Theory: Toward an Ecocentric Approach.* Albany: SUNY P, 1992.
Foucault, Michel. "Afterword: The Subject and Power." *Michel Foucault: Beyond Structuralism and Hermeneutics.* 2nd ed. Ed. Hubert L. Dreyfus and Paul Rabinow. Chicago: U of Chicago P, 1982. 208–26.
———. *Discipline and Punish: The Birth of the Prison.* Trans. Alan Sheridan. New York: Vintage, 1979.
———. "Governmentality." *The Foucault Effect: Studies in Governmentality.* Ed. Graham Burchell, Colin Gordon, and Peter Miller. Chicago: U of Chicago P, 1991. 87–104.
———. *The History of Sexuality, Vol. I: An Introduction.* Trans. Robert Hurley. New York: Vintage, 1980.
Fox, Warwick. *Toward a Transpersonal Ecology: Developing New Foundations for Environmentalism.* Boston: Shambhala, 1990.
Gore, Al. *Earth in the Balance: Ecology and the Human Spirit.* Houghton Mifflin, 1992.
Haeckel, Ernst. *Generalle Morphologie der Organismen.* Berlin: Reimer, 1866.
Jameson, Fredric. *Postmodernism, or, The Cultural Logic of Late Capitalism.* Durham: Duke UP, 1991.
Jarrett, Henry, ed. *Perspectives on Conservation: Essays on America's Natural Resources.* Baltimore: Resources for the Future, 1958.
Luke, Timothy W. "The Dreams of Deep Ecology." *Telos* 78 (1988): 65–92.
———. "Ecological Politics and Local Struggles: Earth First! as an Environmental Resistance Movement." *Current Perspectives in Social Theory* 14 (1994): 241–67.
———. "Green Consumerism: Ecology and the Rise of Recycling." *The Nature of Things: Language, Politics and the Environment.* Ed. Jane Bennett and William Chaloupka. Minneapolis: U of Minnesota P, 1993. 154–72.
Marsh, George. *The Earth as Modified by Human Action.* New York: Scribner's, 1985.
Nash, Roderick. *The Rights of Nature: A History of Environmental Ethics.* Madison: U of Wisconsin P, 1989.
———. *Wilderness and the American Mind.* 3rd ed. New Haven: Yale UP, 1982.
Nebel, Bernard J. *Environmental Science: The Way the World Works.* 3rd ed. Englewood Cliffs: Prentice-Hall, 1990.
Noble, David. *America by Design: Science, Technology and the Rise of Corporate Capitalism.* New York: Knopf, 1977.
Oelschlaeger, Max. *The Idea of Wilderness: From Prehistory to the Age of Ecology.* New Haven: Yale UP, 1991.
Paehlke, Robert. *Environmentalism and the Future of Progressive Politics.* New Haven: Yale UP, 1989.
ReVelle, Penelope, and Charles ReVelle. *The Environment: Issues and Choices.* Boston: Jones and Bartlett, 1988.
Worster, Donald. *Nature's Economy: The Roots of Ecology.* Garden City: Anchor Books, 1977.