Rethinking the Ecological Crisis

*by Daryl Lee**

The stories we tell about nature reveal a great deal about how we think about ourselves, our society and the world in which we live. Nature is one of those potent cultural spaces within which a society plays out its dreams and fears, its ambitions and anxieties. As John Rodman reminds us, "just as our statements about other people tend also to be concealed statements about ourselves, so statements about nonhuman nature tend also to be concealed statements about the human condition."[1] Constructed through our various discourses, ideas of nature can be read as maps of our historically and culturally-constituted consciousness.

One of the most compelling modern-day stories we are writing about nature tells us that our activities are putting nature at risk. This troubling narrative warns us that our current practices threaten to cause massive ecological disruption if we do not soon change our way of life. Certainly enough, all of the elements of this story exist in the world around us as empirical realities. Each of these elements--instances of pollution, deforestation, species extinction, etc.--have their own contexts and thus are meaningful to certain communities of people in certain ways. Yet it is only relatively recently that these individual instances have taken on a more commanding authority as they are woven together into a master narrative called the Ecological Crisis.

History reminds us of how concepts of nature have been closely intertwined with ideas about society. And despite our own positivistic assurances, mapping the social onto the natural continues to be an activity we unconsciously engage in. Thus decoding our constructions of nature tells us much about what we consider to be the good society, and about how we draw the boundaries between order and disorder, balance and imbalance, and stability and instability. From this perspective, the ecological crisis tells a story about a society that has managed to violate its own boundaries.

The ecological crisis tells another story--one with a more discomforting message. All crisis discourse plays upon a textual field of culturally-generated authority. Its power derives from its ability to reconstruct the past and future, thereby delimiting the possibilities available to the present. In structuring events into a crisis, we reveal a great deal about ourselves, most of it not very flattering. As we will see, the ecological crisis is woven into a morality play of biblical proportions. The language, as befits such a play, is one of morality and temperance versus disease and despoliation. Using the world as its stage, crisis discourse foretells apocalypse.

Ecology as (science) fiction

Scientists tell stories about the world. Despite claims to value-neutrality, the laboratory isolates neither scientists nor their work from the contamination of their social context. Scientists are human beings and members of various communities; as such, the questions they ask and the answers they seek are framed by their existential and social worlds. With this in mind, I intend to approach scientific knowledge as if it were literature. Both science and fiction are exercises in story-telling. To read science as literature is to acknowledge that scientific knowledge responds to the world around it; that it does not progress only through some intrinsic logic of discovery. Scientists' narratives, constructed out of the resources of their disciplines, are inextricably woven together with the other discourses of society. Together these form the fabric of our culture.

Reading science as literature enables us to break down the precariously-maintained boundaries between fact and value, description and prescription, and reality and imagination. The literary strategies scientists use--analogy, metaphor and narrative--should not be read as merely helpful explanatory devices. Rather, these strategies are essential for defining, explaining and giving meaning to the objects of scientific inquiry. Drawing upon a potent metaphorical language, the discourses of scientific ecology are extraordinarily rich in meaning. The proliferation of popular ecologies attests to the numerous interpretive possibilities offered by scientific ecology.[2] Reading ecology as

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(science) fiction shows us how the discourses of scientists are also commentaries on society, and how ecologists are implicated in the social construction of the ecological crisis.

Reading ecology as literature reveals just how deeply the human practice of science is embedded in the cultural world. Perhaps more explicitly than any other science, ecology weaves together the growing concerns of what people in western industrial societies call the human condition.[3] Ecology has developed as the focal point for anxieties expressed about unrestrained economic growth, the accelerating rate of industrial and technological change, increasing environmental degradation and the breakdown of social cohesion.

One of the most potent ecological storytellers is Eugene P. Odum, a central figure in the development of the New Ecology--the ecosystem-centred, bioeconomic paradigm that has dominated post-World War II ecology.[4] When we read his discourses as literature, Odum becomes a most lyrical scientist. Ecosystems are communities with specialists and generalists engaging in mutually-beneficial relationships, "just like well-ordered human societies."[5] The nature-society analogy is illuminating, but just as significant is the underlying conviction that order is a natural and positive quality in both the human and natural worlds. In dialectical fashion, social concerns are written into nature, and natural orders become privileged guides for restructuring society. In a world where the social and natural orders are so closely interwoven, threats to one order are immediately translated into threats to the other.

Odum serves us well as a paradigmatic figure who embodies the tensions inherent in the practices and discourses of ecological science. As a natural science, ecology is framed by a familiar set of dichotomies: fact/value, objectivity/subjectivity, science/politics, etc. Scientific authority, founded on the claim of access to the "real," is exercised only within the discursive field of science itself. Science intrudes into politics only as an arbiter of the real. Yet environmental discourses show how difficult it is to maintain these distinctions. This is illustrated in Odum's recent introductory textbook on ecological principles, **Ecology and Our Endangered Life-Support Systems**. Scattered throughout this book are what Odum calls his "personal views" on various environmental problems.[6] These are placed in boxes, spatially and symbolically severing them from the author(ity) of the scientific text. **Ecology and Our Endangered Life-Support Systems** stands as a symbol of the unstable, volatile division between science and politics, and nature and society.

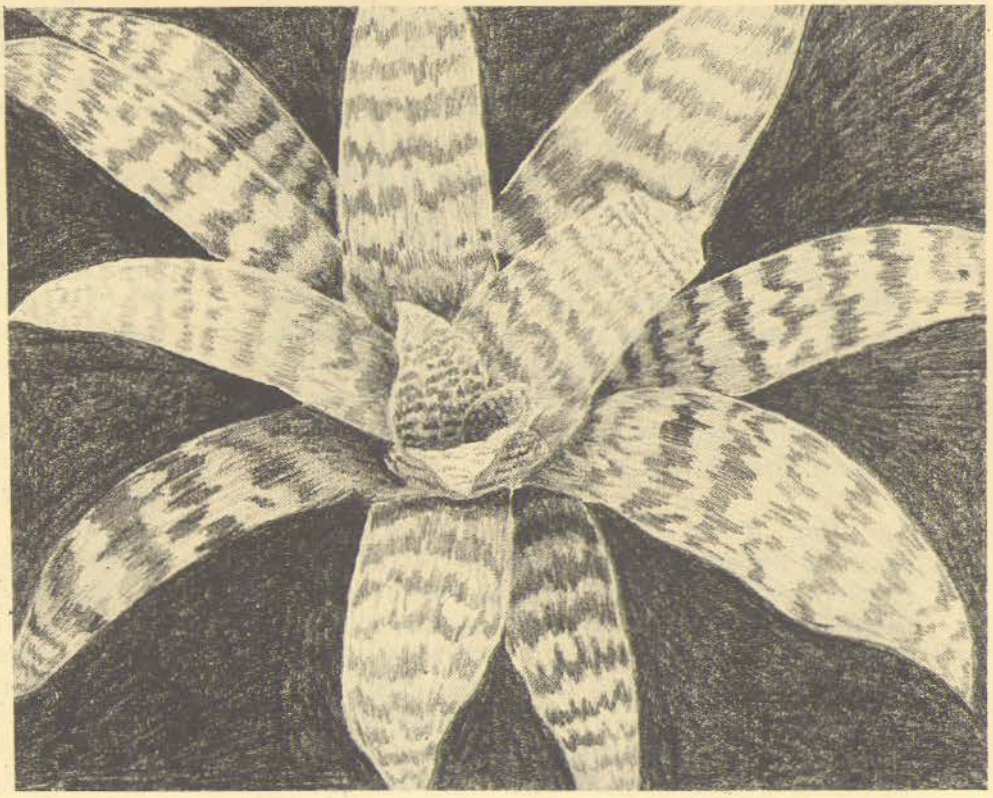
These boundaries between fact and value and science and politics break down if we allow for the idea that scientists actively participate in the construction of the world they seek to know. What is the object to be studied? How is this object to be defined? What questions are to be put to this object? How are the answers to be interpreted and explained? In asking and answering these questions, scientists embed their values into the world they study. Ecology, as Carolyn Merchant points out, "is a particular twentieth-century construction of nature."[7] There is a great deal of twentieth century history embedded in one of ecology's most potent constructions of nature: the ecosystem.

Produced through the practices and discourses of ecology, the ecosystem is a relatively new object of scientific inquiry. Although the term was first coined in 1935, the ecosystem did not become a significant organizing concept until the ascendancy of the New Ecology after World War II.[8] Continuing debates on what criteria are appropriate for categorizing and classifying ecosystems suggest that the concept has not yet stabilized.[9] Given the historical genesis of the ecosystem, it seems reasonable to expect that the concerns of post-war American society--a time and place imprinted with the image of the atomic cloud--are coded into this recently-constructed object of nature.

Ecology in the Nuclear Age

The metaphor of The Bomb serves as a powerful representation of the anxious and ambiguous tensions of post-World War II society. The Bomb is a fusion of order and disorder; in Cold War discourse it is both the guardian of, and greatest threat to human survival. The Bomb, along with its hyper-technological delivery systems and infrastructure, embodies the pinnacle of achievement for a dynamic, energetic scientific-technological culture. It is also an ironic, nightmarish symbol of growth and progress gone out of control, manifested in the escalating insanity of the arms race. As a metaphor, The Bomb serves us well as a potent symbol for the anxieties, tensions and ambiguities experienced by those who live in the nuclear age.

Written into the troubled history of The Bomb is the desire for creating stability in an age when accelerating change is perceived to be an essential, defining feature. Both metaphorically and literally, The Bomb is the most potent creator of order; ironically it does so by threatening disorder. Out of the chaos of World War II emerged a precipitous world order of nuclear nations, maintained by the threat of global atomization. At the same time, technological and industrial change, environmental transformation and sexual and racial challenges to existing social and political structures contributed to the general societal discourse concerning order, disorder and the possibilities for reordering. This is the turbulent social context in which the New Ecologists worked--coding what they experienced as the human condition into their own construction of nature.



The post-war concerns over order and stability in a time of disruption and change are woven into the fabric of nature by ecological science. The legacy of evolutionary theory was to bequeath ecology a dynamic, changing conception of nature. The natural world is a messy affair, full of genetic variance and biological noise. The quest of New Ecology is to find an ordered, underlying structure within this world of change and disorder. Thus, Odum tells us that "the principle function of an ecosystem is to make possible the orderly cycle of life."[10] It is no surprise that his texts are filled with intricate but tidy flowcharts--schematics of the underlying order of the natural world.

In the rarified world of scientific metaphysics, change is strictly a quantitative phenomenon.[11] In a universe of pure matter and motion, change is an alteration of states from one moment in time to the next. Within this metaphysical system, the role of science is to catalogue, explain and predict change. Science is outside the world of values, thus scientists make no judgments as to whether change is good or bad. Reading the story of ecology, however, shows us that the anxieties of post-war society are coded into its construction of nature, and are revealed in its own troubled discourses concerning the nature of change.

In the ecological construction of nature, change is not merely quantitative. Rather, ecosystem change is coded as good or bad in a way that reflects our own particular cultural and social experiences of change. Ecosystem succession is referred to as maturation and development--western codes for personal and societal growth, progress and transformation. The modern western concept of history as progression is replayed in the arena of ecosystem evolution. Self, society and nature are woven together by a common natural impulse for development.

Referred to positively as maturation and development, ecosystem change is intertwined with an underlying commitment to the notions of order and stability. Left undisturbed, ecosystems move towards a relatively balanced climax state. As one biologist notes, "the idea of an unbalanced, stochastically driven natural community inspires distrust."[12] But change that is predictable and which leads to stability is considered, and coded, positively.

That which is considered negative change is coded into the construction of the ecosystem as stress. In ecology, stress is "any environmental influence that causes a measurable ecological change."[13] But as Donna Haraway has noted, over the past half-century stress has emerged as "a dominant integrating concept for post-war social and personal life....In an evolutionary context, stress idiom was part of an anxious discourse about nuclear war, environmental destruction, unprecedented population growth, sexual and racial conflict."[14] In human affairs, stress idiom is used to express the concern that individuals and social systems are ill-equipped to deal with the demands of modern-day existence. External factors are beyond control; the management of stress requires better, more accurate information about unfolding situations. In ecological discourse, stress is a sign that western society is maladaptive. Alleviating stress is about determining and setting limits to human influence on the environment; overshooting these limits threatens unpredictable, disruptive change.

Thus the concept of stress effectively weaves together the anxious post-war concerns with human, societal and natural adaptability in a time of unprecedented change. The Bomb stands at this unstable boundary where order becomes disorder. It is a powerful symbol of progress spiraling out of control and becoming stressful. Coded negatively, stress is translated into environmental discourse as chaotic and thus unpredictable change. Within this frame of discourse, stressed systems lead to ecological disruption, collapse and crisis. Thus stress discourse implies a normative state of nature, captured as the orderly cycle of life revealed by the science of ecology. Stress, and thus (modern industrial) human existence, is abstracted out of this ecological norm. Integrating modern society into nature means successfully adapting it to the constraints of the normative ecosystem. There is no place for stress in an ecological future.

Global Cancers and Social Surgery

In post-war environmental discourse, perceptions of growth and development are intertwined with ideas of order and disorder. The socio-cultural boundary between order and disorder is transcribed onto our perception of growth, yielding two opposing concepts. Healthy growth--both individual and societal--is orderly and self-regulating. Unhealthy growth is growth which spirals out of control, generating disorder and chaos. In a modern fusion of biological and social discourses, runaway growth is captured in a powerful, ominous and potentially dangerous metaphor: cancer.

In the minds of twentieth-century industrial peoples, cancer is a most insidious disease. It symbolizes the body in revolt; it is about the loss of control. Technically, cancer is caused by cells which have lost the ability to regulate and restrain their growth. Metaphorically, cancer is about the body destroying itself from inside. Inscribed into the bodies of society and nature, the metaphor mutates into a disturbing biosocial discourse about undesirables such as "population overgrowth, social disorder, pollution, and other forms of societal and environmental cancer."[15]

In a culture that fears mortality, disease metaphors are especially powerful. Disease is something that is out of balance; it is an affront to the purity of the body. Illness is closely associated to immorality; disease is often considered a punishment for moral weakness. Susan Sontag points out that "cancer is a metaphor for what is most ferociously energetic; and these energies constitute the ultimate insult to the natural order."[16] Once likened to cancer, disruptive changes--in nature and in society --are coded as unnatural and potentially lethal.

Cancer, in a culture closely associated with death, is a crisis disease. Once it corrupts the bodies of society and nature, it is imperative that severe action be taken. Treating cancer is akin to waging warfare of the most drastic kind; chemical and radiation treatments allude to the most frightening weapons ever conceived. Tumours are surgically removed, an expression that has found its way into the euphemisms of modern warfare. To call something a cancer is to advocate taking drastic action against it. To label human beings and human practices a disease is to effectively remove any vestiges of humanity from them. To abstractly dehumanize a situation by likening it to cancer and then suggesting performing social surgery is an incredible act of violence against the person.

As Georges Canguilhem has observed, disease is envisioned as a polemical situation between oppositions--"a battle between the organism and a foreign substance, or an internal struggle between opposing forces."[17] The cancer metaphor lies at the intersection of a number of such oppositions: order and disorder, purity and pollution, the natural and the unnatural. Once translated into the master

opposition of health/disease, there can be no synthetic, dialectical resolution to these oppositional pairs. Framed by the limits of binary categories, disease must be cured, or the patient dies. A person who lives with a disease is considered to be unhealthy and handicapped--i.e. less than a full person.

However, coding health and disease as an oppositional pair is misleading. While disease is defined in reference to a norm, and sickness does imply a state of health, exactly what health is, however, remains open. Canguilhem reminds us that "in order to discern what is normal or pathological for the body itself, one must look beyond the body. With a disability like astigmatism or myopia, one would be normal in an agricultural or a pastoral society but abnormal for sailing or flying."[18] What is considered healthy is dependent upon the context of a particular mode of human existence.

Thus to talk, as Odum and others do, of maintaining "healthy ecosystems" is problematic.[19] Health is a relative concept which cannot be determined outside of the context of human practices. But in environmental discourse, the idea of healthy ecosystems implies a normative, decontextualized state of nature. Framed by binary opposition, ecological discourse is trapped into oscillating between two absolutes: the healthy and the unhealthy. The healthy is modelled after the normative ecosystem: the natural community uninfluenced by human activity, the ecosystem free of stress, the ecosystem that allows for the orderly cycling of life. If an ecosystem is not healthy, then by definition it must be unhealthy. An unhealthy ecosystem is a sign of disease. It is an indicator of unhealthy human practices--activities that are considered disruptive to order, out of balance, unnatural, polluting, immoral--i.e., human practices that do not conform to the limits of the normative ecosystem. Health discourse, like stress idiom, is about socially constructing "objective" limits to human activity.

Ecological Crises and Salvation Mythology

Read as literature, the ecological crisis and its associated discourses are all about negotiating what we consider to be the good life and the good society. Crisis, stress, disease, health--we embed each of these notions with ideas about what counts as order, balance, stability and harmony. These ideas, coded into our constructions of nature, become the guardians and enforcers of the social order. The ecological crisis exists because we collectively adhere to a normative state of nature all the while we engage in practices which disrupt this socially-constructed norm. Ecology inscribes the cultural boundary between order and disorder onto the natural ecosystem. Ecological disruption tells us we have crossed that boundary.

From one perspective, Eugene Odum's **Ecology and Our Endangered Life-Support Systems** is an introduction to ecological principles. From another, it is a story about the loss of innocence and the promise of redemption. Odum's narrative begins with a parable: the ill-fated flight of Apollo 13. Technological Man, ever striving for knowledge and betterment, sets his sights on reaching the heavens. His spacecraft is a tiny, simplistic replica of the Earth; once it leaves the safety of the life-giving biosphere a crisis intervenes. A short circuit causes an explosion, critically damaging the earth-surrogate's life-support systems. The lives of the astronauts are threatened and the mission must be abandoned. Survival is the only imperative. Happily, with the ingenuity of the astronauts and a massive collective effort on Earth, the spacecraft is safely maneuvered back to the life-sustaining womb of the planet.

The remainder of Odum's book is essentially a reprise of this parable, authoritatively couched in the language of scientific discourse. Humanity, unable to restrain itself, is threatening the biosphere with rampantly out-of-control industrialization and population growth. Ecological collapse is inevitable if human beings do not end this unnatural and unhealthy behaviour. Ecology, the arbiter of what is natural, shows us how we are to act and what limits we are to obey. Either we heed this warning and outgrow our immature ways, or we face certain doom. "The Transition From Youth to Maturity" is the title of the epilogue; its allusion to the metaphor of orderly growth, development and transformation hints at both the cultural imperative and biological necessity of social reordering along ecological principles.[20] Society, like human beings, must grow up.

Environmental and ecological discourse is this salvation myth writ large. An extraordinary number of these discourses follow the narrative sequence of the fall and redemption. Man (that western symbol for the collectivity of human be-

ings) begins in a state of harmony and equilibrium with Nature.[21] Through some series of events or misfortunes this equilibrium is upset and Man leaves the Garden to begin a new kind of existence. Man's new life, so seductive at first, begins to spiral out of control, increasingly upsetting the delicate balance of Nature. This headlong spiral reaches a point of crisis, presenting Man with a decision. Either he renounces his unnatural existence or he faces the apocalypse. Choosing--hopefully--to return to his origins, Man is welcomed back into the Garden, reintegrating into a peaceful co-existence with Nature. The front cover of a well-known alternative magazine captures the essence of this salvation narrative: "Paradise Found: How the environmental crisis can improve our lives."[22]

Read within the context of the salvation narrative, the ecological crisis is a way of structuring and giving meaning to the present. The present is constructed as a particular time within the historical-narrative sequence; this time is called a "crisis" (literally, a turning point). Framed by the possibilities of salvation mythology, the present is constructed as a binary opposition. A crisis requires resolution. Either we take drastic action and save ourselves and nature, or we face imminent destruction. As prophecy, crisis discourse attempts to control the present by creating the future.

Like stress idiom and cancer metaphors, crisis discourse straddles the precarious boundary between order and disorder. Crises are situations out of control; the response is to exercise even greater control over whatever it is we define to be the problem. In environmental discourses, the problem is usually associated with some state of human affairs--often economic insanity or reproductive fecundity. These are situations that are out of control; they are sources of disorder. Crisis discourse is about identifying pockets of disorder and advocating that they be reordered. In chaos lies the potential for remaking a new order.

Through narrating the story of the ecological crisis, I have hoped to rewrite it as a problematic. The ecological crisis is just one out of an indefinite number of stories we can write about nature. Along with the rest of the stories we write, the ecological crisis offers itself as a discourse out of which we construct our versions of reality. The narrative I have written about the ecological crisis tells a story about how we construct the world we live in; it suggests that in constructing the world we both create and limit our horizon of possibilities.

As Mary Douglas has pointed out, the control of time is a most effective way of generating a moral consensus. "Time is like all the other doom points in the universe. One and all are social weapons of control."[23] And perhaps she is right when she suggests that "we must talk threateningly about time...if we hope to get anything done. We must believe in the limitations and boundaries of nature which our community projects."[24] Yet, I hope that no one can use this doom point without it weighing on their conscience. For just as the ecological crisis is an effective tool for provoking action, it also radically forecloses the realm of possibilities. And I cannot help but think that in this sense, constructing an ecological crisis is an act of violence against our vision of ourselves.

Notes

1. John Rodman, "The Liberation of Nature?," **Inquiry** 20 (1977), p. 105.

2. For example, Murray Bookchin, **The Ecology of Freedom** (Palo Alto: Cheshire Books, 1982); Bill Devall and George Sessions, **Deep Ecology: Living as if Nature Mattered** (Salt Lake City: Peregrine Books, 1985); Warwick Fox, **Toward a Transpersonal Ecology** (Boston: Shambhala, 1990).

3. Resisting the convention of capitalizing "western" is intended to oppose the notion that there is any one thing that can be called the West. On this point, Edward Said has been instrumental in rendering the identity of the "West" problematic. See Edward W. Said, **Orientalism** (New York: Vintage Books, 1979).

4. Donald Worster, **Nature's Economy: A History of Ecological Ideas** (Cambridge: Cambridge University Press, 1985), p. 311.

5. Eugene P. Odum, **Ecology and Our Endangered Life-Support Systems** (Sunderland, Massachusetts: Sinauer Associates, 1989), p. 30 and p. 52.

6. Ibid., p. ix.

7. Carolyn Merchant, "The Theoretical Structure of Ecological Revolutions," **Environmental Review** 11:4 (Winter 1987), p. 267.

8. Robert P. McIntosh, "Ecology Since 1900," in **Issues and Ideas in America**, eds. Benjamin J. Taylor and Thurman J. White (Norman, Oklahoma: University of Oklahoma Press, 1976), p. 362.

9. Odum, p. 58.

10. Bernard C. Patten and Eugene P. Odum, "The Cybernetic Nature of Ecosystems," **The American Naturalist** 118:6 (December 1981), p. 890.

11. On the metaphysics of modern science, see Alfred North Whitehead, **Science and the Modern World** (New York: Macmillan, 1925).

12. David Simberloff, "A Succession of Paradigms in Ecology: Essentialism to Materialism and Probabilism," **Synthese** 43 (1980), p. 30.

13. Bill Freedman, **Environmental Ecology: The Impacts of Pollution and Other Stresses on Ecosystem Structure and Function** (San Diego: Academic Press, 1989), p. 4.

14. Donna Haraway, **Primate Visions: Gender, Race, and Nature in the World of Modern Science** (New York and London: Routledge, 1989), p. 224.

15. Eugene P. Odum, "The Emergence of Ecology as a New Integrative Discipline," **Science** 195:4284 (March 25, 1977), p. 1289.

16. Susan Sontag, **Illness as Metaphor and AIDS and Its Metaphors** (New York and London: Anchor Books, 1990), p. 68.

17. Georges Canguilhem, **The Normal and the Pathological** (New York: Zone Books, 1989), p. 41.

18. Ibid., pp. 200-201.

19. Odum, **Ecology and Our Endangered Life-Support Systems**, p. 271. See also Don E. Marietta Jr., "The Interrelationship of Ecological Science and Environmental Ethics," **Environmental Ethics** 1:3 (Fall 1979), p. 201.

20. Odum, **Ecology and Our Endangered Life-Support Systems**, p. 271.

21. Feminist scholarship has made it impossible to maintain the fiction that "Man" speaks for all persons. Here, Man, Nature and Garden are advanced ironically (and thus are capitalized) to draw attention to the role these totalizing fictions continue to play in structuring the discourses of the ecological crisis.

22. **Utne Reader** 36 (November/December 1989).

23. Mary Douglas, "Environments at Risk," in **Ecology, The Shaping Enquiry**, ed. Jonathan Benthall (London: Longman, 1972), p. 136, 142.

24. Ibid., p. 52.