

ECOLOGY AND SOCIAL MEANING

Gaia's Last Gasp*Carolyn Merchant*

Is the earth dead or alive? The ancient cultures of East and West and the native peoples of America saw the earth as a mother, alive and responsive to human action. Ancient Greeks and Renaissance Europeans conceptualized the earth as a living organism with respiratory, circulatory, reproductive, and elimination systems. For the past three hundred years, however, Western mechanistic science and capitalism have seen the earth as inert, manipulable from outside, and exploitable for profits. Colonial extractions of resources along with industrial pollution and depletion have pushed the planet as a whole to the brink of ecological destruction.

In 1979, atmospheric chemist James Lovelock revived the idea of the earth as a living organism with his Gaia Hypothesis, named after the Greek earth goddess. According to Lovelock, life on the earth's surface evolved and maintains a comfortable habitat for its own continuance. The chemical constituents of Gaia's abiotic air, waters, and soils interact with her biota as if they were a single organic, living entity. For millions of years, the planet managed quite well along these lines. But can planetary life sustain itself in the face of industrial assaults? Gaia is still alive, but she is deeply wounded and suffering. Her lungs are clogged with smoke, her pores are filled with acid rain, her hair is shorn, her flowered gown is tattered and torn. As we approach the twenty-first century, perceptions of planetary destruction and calls for the earth's renewal abound. A new partnership between humans and Gaia is needed.

The environmental crisis of the 1990s overwhelms that of the 1970s. From Chernobyl radiation to the Alaskan oil spill, from tropical rain forest destruction to polar ozone holes, from Alar in apples to toxins in water, the earth and all its life are in trouble. Industrial production accentuated by the global reproduction of population has severely strained Gaia's capacity for regeneration. Pollution and depletion are systematically linked on a global scale not previously experienced on the planet.

Carolyn Merchant is a professor in the Department of Conservation and Resource Studies at UC-Berkeley. She is the author of The Death of Nature: Women, Ecology, and the Scientific Revolution (Harper & Row, 1980) and Ecological Revolution: Nature, Gender, and Science in New England (University of North Carolina Press, 1989).

AIR

In the ancient world, the earth mother respired daily, inhaling the pneuma, or spirit, from the atmosphere. The earth's "copious breathing" renewed the life on its surface. Today the hotter air of the so-called greenhouse gases threatens Gaia's respiratory balance. As the amount of carbon dioxide and other gases in the atmosphere increases from the burning of fossil fuels and industrial processes, global temperatures are expected to rise three to ten degrees Fahrenheit. "The greenhouse effect is already here and it will worsen," warned scientists and policy analysts at congressional hearings held in the summer of 1988. "The greenhouse effect is the most significant economic, political, environmental, and human problem facing the twenty-first century," according to Senator Timothy Wirth. Half of the world's dioxide emissions are produced by three countries alone: the United States (21 percent), the USSR (19 percent), and China (10 percent).

With acceleration of the greenhouse effect, winters worldwide are predicted to become stormier, summers hotter and drier. Seas will rise one to three feet over the next half century, and hurricanes will become more powerful as the oceans warm. Waterfront homes and villages will be flooded, droughts will increase in severity, grain-growing regions will move north, and whole forests and wild species will be lost. Although there is much debate over the timing of the effect, a series of measures to slow it have been recommended: stopping global deforestation, planting trees, conserving heating fuel, and shifting to alternative energy sources.

Ozone depletion is another disruption of the Gaian respiratory system by industrial production. In 1985 scientists reported a hole in the ozone layer over the Antarctic. The production effects of chlorofluorocarbons (CFCs) in the northern industrialized countries were suddenly manifest at the South Pole. CFCs are used as refrigerator and air conditioner coolants, as primary components of Styrofoam, and as propellant gases in spray cans (banned in the U.S. in the 1970s, but still used in other countries). Whenever we buy a hamburger or a cup of coffee in a Styrofoam container, whenever our automobile leaks or we turn in an old refrigerator for a

new one, we are inadvertently contributing to upper-atmosphere ozone depletion. As a result of worldwide concern, twenty-four countries meeting in Montreal in 1987 agreed to a goal of CFC reduction of 35 percent by 1999. Alternatives to CFCs are now being researched, but much work needs to be done by science, industry, and Congress in eliminating CFCs from the global atmosphere. Industry, for example, will hardly prove eager to spend millions of dollars reducing pollution and overhauling its operations. We will need more than mere voluntarism or the spirit of cooperation. For disruption by industrial production of the Gaian respiratory system—the atmospheric balance of gases—is intimately connected to disruption of the ancient Gaian circulatory system.

WATER

As the waters on the earth's surface ebbed and flowed, evaporated into clouds, and descended in the form of dews, rains, and snows, the earth mother's blood was cleansed and renewed. From high mountain lakes to wild rushing rivers, Gaian waters are now threatened by acid rain. Solid wastes wash up on beaches; globules of oil float on the surface of even the remotest oceans. Plastic wastes are causing the deaths of upwards of two million birds and 100,000 marine mammals a year. Seabirds, fish, turtles, and whales lunch on small plastic pellets produced as wastes in the plastics industries. Birds become entangled in plastic six-pack rings that will be present for another 450 years and outlive the generations they are extinguishing. Marine mammals are entrapped in plastic drift nets six to thirty miles in length that eventually sink under their weight. Global water pollution needs to be halted and water quality restored.

SOILS

The thin layer of soil on the earth's surface is Gaia's skin. European peasants and Native Americans nurtured the land, performed ritual dances, and returned the land's gifts to assure continued fertility. Today erosion and soil pollution from insecticides with long-lasting half-lives are threatening croplands everywhere. Over the next fifty years, grain production in the United States could sink to half of its 1980 level, affecting millions of people. Around the world Green Revolution farming techniques that depend on Western insecticides, fertilizers, and machinery have replaced traditional methods, often with disastrous consequences for indigenous peoples. In India, according to conservationist Vandana Shiva, land has been used to feed people for over forty centuries, with only 5 to 10 percent of the surpluses leaving the local villages. Today, the Green



Revolution is teaching Indian farmers, as Shiva puts it, "to forget about the hunger of the soil and the stomach and to go after their own hunger for profits." Soil conservation and sustainable agriculture based on the wisdom of traditional peoples needs to be combined with many of the positive advances in twentieth-century agriculture.

BIOTA

In the ancient theories, the earth mother's capacity for reproduction brought forth the rich variety of life found on its surface. Today Gaia's generative processes are being aborted. In the words of *Time* magazine, "the death of birth" poses another immense global threat to all species. A National Science Foundation study predicts that a quarter of the earth's species of plants, animals, microbes, and fungi will become extinct over the next several years unless extraordinary measures are taken to protect the ecosystems in which they live. Only 1.4 million of the five to ten million species of life in the world have even been named. Increased efforts must be taken to identify the rest, understand their ecology, and educate the public accordingly. International agreements have been reached on halting some of the most visible threats; yet changes in policies and practices may not come in time to preserve the lives of known

endangered species, much less those not even identified.

Trees are the earth mother's tresses. According to Thoreau, Mother Nature's head was adorned with "a profusion of fringes and curls," but sadly the lumberer was capable of "shearing off those woods and making earth bald before her time." Today forests that absorb CO₂ and produce oxygen—linking air, water, and biota—are disappearing at a rapid rate. Tropical forests cover 2.3 million square miles of the earth's surface and are being cut at the rate of 100 acres a minute or more. And the rate of destruction is increasing. According to some predictions, little of the forests will be left by the year 2040. The United States imports enough timber from tropical rain forests each year to cover the state of West Virginia. In Central and Latin America, tropical rain forests are being cut down to pasture cattle for the fast-food industry. In Indonesia 500,000 acres of tropical rain forest have been converted to eucalyptus plantations to produce toilet paper for North America. Much of the rain forest being slashed in Malaysia is used by Japan to make throwaway construction forms, boxes for shipping, and disposable chopsticks. At a June conference on "The Fate and Hope of the Earth" held in Managua, Nicaragua, Martin Khor of Indonesia, quoting Gandhi, admonished: "There are enough world resources for everyone's need, but not for everyone's greed."

In the United States, Pacific old-growth redwood and Douglas fir forests are being logged for export to the Far East. Some 70 percent of the total harvest of uncut logs is exported to sawmills in Japan and Mexico—enough for 37,000 jobs in the wood-products industry. Modernization over the past decade has replaced labor-intensive lumber mills with automation, reducing by one-third the number of jobs available. This process, instead of saving the threatened spotted owl, is putting people out of work. Trying to resolve these complex problems will require enormous sensitivity, as well as changes in lifestyle on the part of Northern Hemisphere citizens.

Some scientists believe that even if we do not destroy Gaia's life with a nuclear bang, we will poison it in a toxic whimper. Toxic chemicals range from factory emissions, smog, and radon in the air to pesticides in the soil and trichloroethylene in drinking water. According to environmentalist Barry Commoner, the earth is being invaded by chemicals unknown to biological evolution. "An organic compound that does not occur in nature," he argues, "[is] one that has been rejected in the course of evolution as incompatible with living systems." Because of their toxicity, "they have a very high probability of interfering with living processes." Over the past thirty years the production of organic chemicals from petroleum will have increased from about seventy-five billion pounds per

year to over 350 billion. Concerns such as these led California citizens to pass Proposition 65, an antitoxics initiative, in 1986 with a 63 percent vote. At present, 242 chemicals on the state's list are being examined to determine their likelihood of causing cancer or birth defects. Scientific research, along with citizen actions such as those being undertaken by the National Toxins Campaign, are a vital part of the current effort to reduce toxins in the environment.

There is a renewed interest in an environmental rights amendment to the U.S. Constitution that would dignify and enforce the efforts of the states to clean the environment.

What can be done to turn the tide of the global environmental crisis in production and pollution? In 1970, the first Earth Day galvanized an incipient environmental movement into national action. An outpouring of citizen concern resulted in the passage of environmental laws and tighter regulations: the National Environmental Policy Act (NEPA) was passed in 1969, and with it the President's Council on Environmental Quality was created; the Clean Air Amendments of 1970 strengthened the Clean Air Act first passed in 1955; in 1972 water regulation was also brought under stricter federal control through the Clean Water Act, amended by the Water Quality Act in 1987; in 1976 the first comprehensive legislation on toxins was passed as the Toxic Substances Control Act (TOSCA). The list goes on. Two decades of experience in environmental regulation have shown us what can and cannot be accomplished. Still, despite obvious gains and citizen activism, industrial pollution continues to threaten the quality of life for all citizens of the planet.

What more can be done? Ultimately capitalist production must give way to some form of steady-state economics that brings production and reproduction into balance with planetary ecology. Yet a global ecological revolution of this magnitude is unlikely to occur fast enough to resolve the immediate problems of health and environmental quality for ourselves and our children. A more immediate approach would reconsider a tactic introduced by the environmental movement of the 1970s: we might begin by amending the highest law of the land.

A CLEAN EARTH AMENDMENT

In 1970, the year of the first Earth Day, a constitutional amendment was introduced in Congress that would have guaranteed every person a right to a clean environ-

ment. During the 1970s, many states (including Hawaii, Montana, Illinois, and Massachusetts) added environmental rights amendments to their constitutions. These amendments hold that the state shall provide for the implementation and enforcement of the right to a clean environment, and that each person may enforce this right against any party through legal proceedings. Many countries have environmental rights provisions in their constitutions, and others are in the process of adding them. The National Wildlife Federation has proposed an Environmental Bill of Rights, and the United States Conference of Mayors is considering endorsing a similar measure. More radical amendments that would give rights to other species have also been proposed. There is thus precedent for and a renewed interest in an environmental rights amendment to the U.S. Constitution that would dignify and enforce the efforts of the states to clean the environment, broaden the basis for legal suit, and raise levels of compliance with the legislation of the past two decades.

In 1990, we must rally the people of the United States to support a new constitutional amendment which states: "Every person has the right to a clean, healthful environment. The Congress and the individual states shall have the power to enforce this article by appropriate legislation." The final wording of the amendment would of course be determined by environmental and constitutional lawyers and by Congress, through hearings and consultation with American citizens. But clearly action

has to be taken from above as well as at the grass roots: strong resistance is to be expected from business concerns that stand to be threatened by regulation. They are not likely to act on their own.

The new decade could be a turning point in human efforts to save the earth. Imagine hundreds of thousands of people demanding that they be guaranteed clean air, clean water, and a healthful, nontoxic environment. A variety of grass-roots environmental groups, labor groups, women's groups, and others could endorse an environmental amendment. Thousands of bumper stickers, ecology flags, and buttons could flood the country. A reinvigorated environmental movement could demand action from Washington. It could insist that the Congress of the United States pass a Clean Earth Amendment to the Constitution. The 1990s could become the new environmental decade as state after state ratifies the amendment. United we could enter the twenty-first century with guaranteed environmental rights. Through passage of an environmental amendment, we of the twentieth century could bequeath to our children and our grandchildren in the twenty-first century a clean, healthy, beautiful earth on which to live. Gaia needs us; we need Gaia. □

[Endnote: To support the Clean Earth Amendment please contact the Clean Earth Amendment Coordinating Committee, 2208 Rose St., Berkeley, CA 94709.]

