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PROCEEDINGS OF THE CONFERENCE
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Jan Zimmerman

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Ann Markusen

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Carolyn Merch

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Judy Smith ...

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Alberta Parker

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Out Of The Past: Women And Nature
Carolyn Merchant

Traditionally, nature has been viewed as female, as a nurturing, living organism which reacted to the activities of its human inhabitants. Women were symbolically linked to nature, as both cared for humanity. However, a fundamental change in metaphor occurred during the Scientific Revolution of the 16th and 17th centuries; the earth came to be viewed as a machine, dead, incapable of reaction. This attitude sanctioned the indiscriminate exploitation of the earth and encouraged a similar attitude toward women. Dr. Merchant reviews the highly influential writings of philosophers and scientists of the time, such as Francis Bacon and Dr. William Harvey, and finds parallels much in evidence in today's technological language. But in the past 20 years, women have begun to assert their rights through feminist organizations. Simultaneously, ecologists have begun work to ensure the survival of "spaceship earth." Since these two plights have historical and metaphorical links, the mutual fight for respect and preservation must continue into the future.

For some time I have been interested in the relationship between women and nature on the one hand, and ecology and feminism on the other. I would like to give some perspectives on both those connections.

Ecology comes from a Greek word "oikos" which means house. The science of ecology is really the science of the household, the household extended to include the earth. Environmentalism involves the study of the whole earth as a household, and women traditionally have mediated between the two. Nature has been thought of as female in many cultures over long periods of time, and in our own culture for several hundred years the house has been thought of as women's sphere.

First, let us go back to the 16th and 17th centuries and explore the interconnections between the female and nature, and then see what happens when certain types of technology are introduced in the Scientific Revolution of the 17th century. At that time, a tremendously important change occurred in the metaphors which describe human experience.

In the Middle Ages and in the Renaissance the primary metaphor binding human life together was that of the organism. The cosmos was thought of as a living organism with a body, a soul and a spirit; and the earth was thought of as alive, as a nurturing mother.

The change that came about which is so critical as an important root of today's environmental crisis is the change from the organism as predominant metaphor to that of the machine. The machine, by the end of the 17th century, served as the root metaphor. The self, society, and the cosmos came to be thought of in terms of atoms or parts that were grouped in associations or governed by external forces.

For Descartes, one of the most important modern philosophers, the human body

became a machine. Animals were merely machines that did not have souls or feelings; human beings at least had souls, but, after Descartes, the dualism between the mind and the body became a major philosophical problem in Western society.

In the 17th century, for political philosophers such as Thomas Hobbes and John Locke, society also became a group of individuals held together by a contract, or an external force. People voluntarily gave up certain freedoms in order to be protected by the sovereign. In Hobbes' introduction to *The Leviathan*, the sovereign was shown raising a sword with the people grouped as atoms within him. The cosmos also was cast in metaphorical terms as a machine, with God as an engineer or mathematician. God set the universe in motion at the beginning by putting forces into it that were subsequently transferred among the particles.

The critical change that took place between the time earth and nature were viewed as organisms to the time they were viewed as machines was the rise of a commercial economy, based on technology, and the introduction of increasingly powerful machines — a mercantile economy based on the exploitation of nature. Metals such as gold, silver, iron, mercury, and copper were extracted from the earth and made to serve as exchange media. During these two critical centuries, society moved away from a hierarchical, feudal, land-based agrarian society toward a fast-moving commercial economy.

In the Renaissance, the earth was thought of as a nurturing mother, a female with whom one interacted and who felt sensation. The world had reason, otherwise how could the earth, as a mother, have produced reasonable, rational human beings? The earth, in this view, had physiological systems like those of the human being. The circulation of water and air through the veins in the earth were like fluids ebbing and flowing in the human body. The earth poured forth sweat in the form of dew, and even had its own elimination system — a volcanic eruption or an earthquake, for example, was the indignation of the sacred parent, Mother Earth, expressing herself and breaking wind. The earth had sensitivity and could react. However, as soon as the earth became a machine made up of dead, inert parts in which there was no life, worries about the earth's reactions diminished. The Scientific Revolution and the change in metaphor from the earth as organism to the earth as machine sanctioned the indiscriminate exploitation of its forests, the draining of its swamps, and the mining of its entrails for precious metals.

With the rise of modern science in the 17th century, some of the so-called fathers of modern science, the giants who brought us this new world view, talked specifically about technologies affecting the earth and the female. According to Francis Bacon, technological operations on nature were to be modeled on the work of miners and smiths. The blacksmith, for example, shaped nature on the anvil, and the smith penetrated into nature's womb to extract metals. Bacon said the truth of nature lies hid in deep mines and caverns, and described the way in which the new scientists ought to study nature. The studious among them, he said, should sell all their books and build furnaces; they should forsake Minerva and the Muses as barren virgins and instead rely on Vulcan.

Now if we examine Bacon's many volumes of letters, articles, and books for the kind of language he used to describe nature, we find some incredible examples of sexual metaphor. The new man of science, he argued, must not think that the inquisition of nature should be in any way forbidden. Nature should be made a slave, put in constraints, and molded by the mechanical arts. The searchers and spies of nature should discover her plots and secrets. This kind of language is very reminiscent of the European witch trials in which women were put on the rack and tortured to reveal their secrets and to indict other women in their immediate communities. Bacon argued that we must hound nature in her wanderings, and to lead her and drive her to the same place again and again. In a revealing statement he wrote: "Neither ought a man to make scruple of entering and penetrating into these little holes and corners when the inquisition of truth is his whole object." Moreover, there was hope that "there is still laid

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up in the womb of nature many secrets of excellent use." In his book, *The Masculine Use of Time*, he said "I'm come in truth leaving to you nature and all her children to bind her to your service and make her your slave." Nature should be "taken by the forelock, being bald behind."¹

This language is not just archaic 17th century metaphor. It is used today in discussing such things as "virgin lands" and "man's war against Mother Nature." Soon after the eruption of Mount St. Helens volcano in May of 1980, a geologist who was interviewed on television was asked "What is Mount St. Helens going to do next?" He answered, "We really don't know her intentions. . . . We haven't been able yet to penetrate her deeply enough with our instruments."

So, one thing we desperately need is a transformation in language and symbol structures. We can take up the earth as a new metaphor to replace the machine. There are many new publications that use the earth as a root metaphor, such as *Mother Earth News*, and *Patient Earth, One Women, One Earth*, and *Spaceship Earth*. All of that is critically important, but, as will be argued, a mere change in language is, in and of itself, insufficient.

A second example from the 17th century comes from the work of William Harvey, another of the so-called great fathers of modern science, and discoverer of the circulation of blood. Harvey was involved in the midwifery controversy in the 1620s and '30s, as one of the censors of the Royal College of Physicians. In this period, Dr. Peter Chamberlain, his son, and several others in that dynasty, had invented forceps, and were trying to get this new instrument licensed, arguing that only doctors with licenses should be able to deliver children. This undermined the time-honored monopoly that women had had over childbirth, so the women of that time put together a petition that argued against licensing male doctors as midwives. In their petition they said that Dr. Chamberlain had no experience in midwifery but by reading. (Imagine having a child delivered out of a book!) And further:

Dr. Chamberlain's work and the work belonging to midwives are contrary to one another, for he delivers none without the use of instruments by extraordinary violence in desperate occasions which women never practiced nor desired, nor have they parts nor hands for that art.

Thus, at the same time that the earth was falling prey to the exploitative technologies of the machine age, women were losing power over their reproductive functions to males through a technology which men invented and controlled.

Toward the latter part of his life, William Harvey published a book on generation in which he discussed the role of the female in reproduction. His view of women comes from Aristotle, who thought of the male as active and the female as passive — the male supplied the reason and the soul, the female supplied the matter. Harvey, elaborating on this perspective, said:

. . . among animals where the sexes are distinct, matters are so arranged that since the female alone is inadequate to engender the embryo and to nourish and protect the young, a male is associated with her by nature as the superior and more worthy progenitor, as a consort of her labor, and the means of supplying her deficiencies.

Many of his arguments were based on reproduction in the hen and the rooster, and he eulogized about the rooster as being the epitome and perfection of the male:

Why should we so much wonder what it is in the cock that preserves and governs so perfect and beautiful an animal, and is the first cause of that entity we call the soul; but much more what it is in the egg of so

great virtue as to produce such an animal and raise him to the very summit of excellence.

He also argued against Galen and his followers, that there could be a female semen produced by the genital organs of women:

I, for my part, greatly wonder how anyone can believe that from parts so imperfect and obscure a fluid like the semen so elaborate, so concoct and vivifying, can ever be produced that would be adequate to overcome that of the male. How should such a female fluid get the better of another concocted under the influence of a heat so fostering, of vessels so elaborate, and endowed with such vital energy? How should such a fluid as the male semen be made to play the part of mere matter?

The Scientific Revolution, in so far as it is grounded in the machine as metaphor, has negative implications for both the environment and for women. The last two decades, however, can be viewed as the beginning of an era of liberation for both women and nature. The rise of the environmental movement and the rise of the women's movement came about simultaneously.



In 1962 Rachael Carson published her book, *Silent Spring*, in which she argued that all around us organisms are dying. The greatest threats to the lives of human beings and the life of the earth come first from nuclear technology and secondly from pesticides such as chlorinated hydrocarbons; for example, DDT, Aldrin, and Dieldrin. She single-handedly brought to public attention the critical importance of what was happening to the food chain as these chemicals began circulating through it. Although this information had been available in scientific reports and articles, Rachael Carson broke the story to the public in her beautifully written book.

In the following year Betty Friedan's *Feminine Mystique* marked the liberal phase of the women's movement and the liberation of women from the confines of the household. Like Carson, she was concerned with life and with women's own self-development and self-fulfillment within a program for a total life plan.

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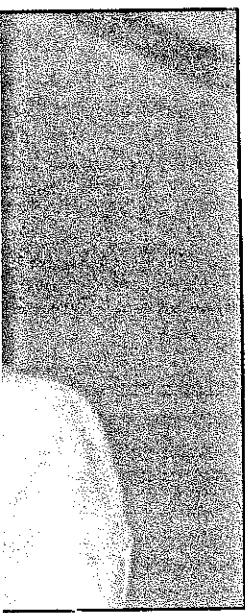
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Both of these women were attempting to liberate the environment and the female sex from the repressions generated in the 17th century, which formed the way in which the modern world looked upon the earth and upon the household.

In certain very important ways, the goals of women and the goals of the environmental movement are unified, as the theoretical connections that have come out of the ecology and women's movements of the last two decades reveal.

It is language, after all, which is used to describe both nature and human society. Many of those words are the same words, and can have repressive or unhealthy connotations for both women and nature — or they can have liberating ones. We cannot eliminate the repressive connotations without a simultaneous revolution in economic and social structures, but it is important to see the linguistic interconnections.

The connections are derived from the structure and functions of nature and society. Structurally, for both the ecology and women's movements, the parts of the system have equal value. In nature the components of an ecosystem are all of equal importance for the health of the whole. We need healthy air, clean water and good, fertile soil that has not been polluted by pesticides, hazardous wastes, and toxic chemicals. And we need to preserve the whole biotic system of plants, animals, bacteria, and fungi that operate together to form the life cycle and the food chain. Every one of these elements is of critical importance and of equal value in maintaining the health of the system.

Similarly, feminism asserts the equality of both men and women. Policy, goals, legislation, and economic and household arrangements should be directed toward equalizing roles and maintaining equity for both women and men. Both ecologists and feminists will assign value to all parts of the human nature system and take care to protect each part in cases of threat.

The second idea is that the earth is our home. The earth is a habitat for all living organisms and homes are habitats for groups of humans. Each ecological niche is a position in a community, whether it is a human community or the larger biosphere. Each niche is a place in the energy continuum into which atoms, molecules, and energy enter and leave. Ecology is the study of the earth's household.

The houses in which human beings live are places wherein life is cherished and sustained just as the earth sustains living things. The household is a place where food is prepared, where clothes are repaired, and where human beings are cared for. In and out of our houses flow energy, molecules, and atoms. Some of these are life sustaining, and need to be preserved and protected. Others are life-defeating and lead to a sick planet, a sick home, and a sick body. Radioactive hazards exist in some people's neighborhoods; hazardous chemicals are permeating some people's backyards and basements. Other chemicals have invaded the kitchen.

The home is no longer a haven. We have substances such as Easy Off, which contains hazardous alkalis. Indoor air pollution is becoming a problem in apartment complexes built on top of garages where people start and stop their cars intermittently throughout the day. Carbon monoxide fumes filter up through the walls and floors and permeate people's living spaces.

Some of the insulation which has been used recently contains urea formaldehyde and has been found to be very hazardous. In response to the general concern over energy conservation, people had insulation blown into their walls, and this particular type has been found to be a long-term health hazard. Phenols in bathroom cleaners are bad for pets, and cosmetics and shampoos can cause headaches and respiratory problems in humans. Thus, we need to be aware that chemical hazards and energy hazards like color television and microwaves can endanger our homes.

The third parallel derives from the functions of systems, and this is the idea of the primacy of process. The laws of ecology are based on the laws of thermodynamics. The first law of thermodynamics asserts that the total energy in the universe is conserved and is exchanged through the interconnected parts of the ecosystem. Energy flows through the system of living and non-living parts on the earth in a dynamic steady-

state, open-ended process. The world is active and alive, not dead. Its processes are cyclical, stabilized by cybernetic (feedback) networks.

The stress on dynamic processes in ecology has its parallel in human society inasmuch as the flow of information through the human community is the basis for decision-making. Open discussion of all kinds of problems is essential for the future. We cannot just leave this to the highly trained experts, usually males, in technology or in ecology. We need to work out a system in which both men and women, lawyers and workers, ecologists and technologists contribute equally. They all have equally valuable information and experience.

The final functional connection between the two movements is the notion that there is no free lunch. No free lunch is the essence of the laws of thermodynamics. Each step one takes up the organized ladder of life results in the release of unusable energy, or entropy, into the surroundings. The energy that is useless for work is continually increasing in the surroundings every time a commodity is produced, or an item is manufactured for sale on the market. Nature cannot be expected to be continually available to provide free services, free goods, and free lunches. Karl Marx called this the "capitalist huckstering of the earth"; nature is considered a free resource which people take gratis in order to make profits. But profit-hungry human beings cannot continue to extract nature's free goods and services. Whenever possible, we need to recycle resources and products.

Feminists, also, are moving away from the idea of doling out free lunches and free household services. Housewives spend most of their time struggling to undo the effects of the second law of thermodynamics. They are constantly trying to recreate order out of the disorder and chaos that seems to come naturally into the household. It is necessary to break down the dualism of public and private spheres and of male and female roles. And we need cooperation and equality between men and women in all kinds of specific contexts — in day care centers, in child rearing and household work, in productive work, and in sexual relations.

The technologies, then, which have a low impact on the environment and low impact upon the household are the ones which we need to develop in the future. Certain kinds of issues can involve women as feminists and as ecologists because they affect our own bodies and reproductive systems as well as the health of the earth. Women can put their energy as environmentalists and as feminists into issues such as nuclear technology, radioactive wastes, hazardous chemicals, pesticides and herbicides that have long-term implications for the health of the earth and the human species. As women, we need to undertake a program of action that can lead us sanely into the future.

Carolyn Merchant (PhD, History of Science, University of Wisconsin) is Assistant Professor of Environmental History, Philosophy and Ethics in the Department of Conservation and Resource Studies at UC Berkeley. Dr. Merchant recently published the book, *The Death of Nature: Women, Ecology and the Scientific Revolution*. In her former position at the University of San Francisco, Dr. Merchant directed a pilot grant entitled "Technological Culture and the Human Prospect."

¹For quotations, see Carolyn Merchant, *The Death of Nature: Women, Ecology and the Scientific Revolution*, (San Francisco: Harper and Row, 1980), pp. 153, 158-59, 168-71.

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