

16

Ecology and the Moral Use of Energy

*It is the top of the ninth inning. Man, always a threat at the plate, has been hitting Nature hard. It is important to remember, however, that NATURE BATS LAST.**

ENERGY AND ECOLOGY

Without energy, nothing would happen. Energy is the power to do things. But every use of energy has consequences far wider and more long-range than its immediate application. As we move toward the end of the twentieth century, we are discovering some of the unsettling aspects of the use of energy, whether to heat our homes, drive our cars, produce our conveniences, or kill our enemies. These discoveries bring us face to face with the moral responsibility we have for using energy resources without causing unintended consequences for our environment, the ecological balance, and our "enemies." There are limits to life on a small planet. How we understand those limits and act accordingly has become a central moral concern for many millions of people today.

As people struggle to pay rising fuel costs and higher taxes for social services for increasing populations and to combat the effects on their health of chronic pollution, they come to see the consequences of not observing the limits of nature and ecology. An "ecological conscience" is now forming in many people. Ecology comes from the Greek word for house and means literally "the study of houses or environments." Recently it has come to mean a study of the web of life in which all living things are related to each other. In commenting on the work by the biologist Eugene Odom, William Blackstone asks us to think of ecology as involving a "biological spectrum which includes the following: protoplasm, cells, tissues, organs, organ systems, organisms, populations, communities, ecosystems, and the biosphere." The biosphere is

*Paul R. Ehrlich, "Eco-Catastrophe!" in *The Environment Handbook*, ed. Garrett De Bell (New York: Ballantine, 1970), p. 176.

the biologically inhabitable soil, air and water constituting that part of the earth in which ecosystems can operate, and an ecosystem or ecological system is viewed as the population of a community, whether human or nonhuman, and the nonliving environment with which it functions.¹

Central to the ecological concern are those mechanisms that regulate the relations in nature. These regulatory mechanisms keep the organism in balance with itself and its environment. If you alter one part of the organism, the regulatory mechanisms will insure that other parts make suitable compensation; the heart pumps faster when the legs run more quickly. What ecology is most sensitive to are those man-made changes in the environment that bypass or override the ability of nature to make appropriate adjustments. When pesticides were introduced, they had the immediate effect of controlling undesirable bugs and the long-range effect of poisoning food supplies and creating conditions (which the regulatory mechanisms of nature couldn't combat) for the development of even more pesticide-resistant insects.

The moral issues involved in ecological awareness are among the most original and challenging moral dilemmas of our time: original because they require us to think about the possibility of granting rights to animals, trees, and other nonhuman organisms; challenging because they might require us to set aside long-cherished expectations about our standard of living and the economic practices used to sustain it.

FOUR POSSIBLE AREAS OF DANGER

There are four basic areas in which we experience the ecological problem most severely today. First, the population of the world is increasing at such a rate that food supplies, resources for daily existence, and space for living are being threatened. Second, the pollution and by-products of our industrial growth are threatening the ecological balance around the world. Third, due to profligate consumption there is a dangerous depletion of many of the natural resources needed for a healthy life (e.g., the oil crisis of recent years). Fourth, there is the danger of widespread sickness and death due to nuclear radiation, either in the form of improper containment of nuclear waste or, more catastrophically, in the form of nuclear war. Each of these problems is a warning signal that the regulatory mechanisms of nature are in danger of being overloaded or short circuited. Before turning to the nature of today's ecological problems, it is necessary to see briefly why they seem to have emerged at this time in history and what values have aided and abetted their development.

¹William T. Blackstone, "Ethics and Ecology," in *Philosophy and Environmental Crisis*, ed. William T. Blackstone (Athens: Univ. of Georgia Press, 1974), p. 18

Historical Roots of the Crisis

James C. Logan in his article "Ecological Considerations" traces much of the current ecological crisis to "the inherited value system" of Western thinking. Specifically, the values he identifies as contributors to the crisis are (1) that the human race is to be lord and master over the Earth. Relying upon the Biblical story in which Adam is given "dominion" over the Earth by God, this value isolates man from the rest of nature, leading him to believe that he can do what he wants with nature without regard for the consequences. (2) This led human beings to regard nature as without value, and thus subject to exploitation in the name of human need. From the investigation and utilization of nature came a third value: (3) that self-worth for individuals and nations was to be measured by their degree of consumption or possession of the world's resources. An ever rising standard of living has come to be regarded as a "right," and is defined as the ability to purchase the latest, most technologically sophisticated goods, without regard for the "need" for such goods or for the depletion of resources this need creates. Finally, (4) there is the value, expressed by John Locke (see Chapter 4 in this book) that every person "is absolute lord of his own person and possessions . . . and subject of nobody." If individuals insist upon their right to own as much property as they can secure and to use it as they see fit, it will become virtually impossible to accord any place to the right of the ecological system as a whole, or the right of future generations to a liveable environment. Under the domination of such a value it would be very difficult for nations to work together in programs of mutual restraint to preserve ecological balance and the dwindling resources of the Earth.²

Few would deny that the human race faces grave ecological problems. As we shall see, however, there are some who would claim that the above values do not lead inevitably into ecological disaster and can, in fact, serve as the basis for extricating ourselves from danger. In any event, they argue, these values are superior to any alternative ones being suggested as their replacement. Other people argue strenuously that an entirely different set of values is necessary if we are to continue living in harmony with nature and in peace with ourselves.

Population

What are the conditions that now prevail or threaten us in the near future as far as our relation with nature is concerned? One of the most serious,

²James C. Logan, "Ecological Considerations," in *The Population Crisis and Moral Responsibility*, ed. J. Philip Wogaman (Washington, D C.: Public Affairs Press, 1973), pp 95-108.

and factually documented, perils is that of increasing population. "The world's population is increasing at a rate which renders distress, famine, and disintegration inevitable unless we learn to hold our numbers within reason."³ Currently the world population (now around three billion) is expected to double in thirty-seven years. The doubling time has dropped from one million years, when world population first reached about five million (around 6000 B.C.), to one thousand to two hundred to eighty and now to thirty-seven.⁴ One consequence of this increase in population is sheerly physical. According to Paul B. Sears, it will be less than 700 years until there is standing room only in the United States, with each space of 3 by 2 feet occupied. On this basis there is room for exactly 4,646,400 people in each square mile.⁵

The obvious problem that ever-increasing population poses is how to feed, clothe, shelter, and provide for millions more people from a finite, limited resource: Earth. Starvation will occur on a massive scale. The balance of nature could be so radically altered as to make life impossible for humanity in anything like its present numbers. Not only must the feeding cycle be maintained, but also the cycle that regenerates the air. This whole network of relationships is at risk. Even those who believe that technology can provide ways of sustaining such an increase in population admit that to make human beings adjust to the increased urbanization and industrialization "the individual must be specifically processed. . . . The more complicated and productive the synthetic habitat becomes through technological development, the more complicated becomes the acculturation process."⁶

A particularly troubling aspect of the population problem to some critics is the unequal consumption of the limited resources that remain. The most technologically developed country, the United States, with only about one-fifteenth of the world's population uses *well over half* the world's raw materials each year.⁷ If there is to be a just and equitable solution to the population crisis on a worldwide basis, it is clear that Americans are going to suffer a greater decline in their level of consumption than the peoples of other countries.

In addition to the problems of feeding and providing for the basic survival, with dignity, of a ballooning population, there are the elemental problems of feeling crowded, almost suffocated, by the billions of people

³Vannevar Bush, quoted in Philip Appleman, "What the Population Explosion Means to You," *Ladies Home Journal* 80 (June 1963), p. 59.

⁴Paul Ehrlich, "The Population Bomb," in De Bell, p. 220.

⁵Paul B. Sears, "The Inexorable Problem of Space," in *The Subversive Science: Essays Toward an Ecology of Man*, eds. Paul Shepard and Daniel McKinley (Boston: Houghton-Mifflin, 1969), p. 82.

⁶Edward Higbee, *A Question of Priorities*, (New York: Morrow, 1970). Quoted by Edward Abbey, "How to Live on This Planet Earth," *New York Times Book Review*, April 19, 1970, p. 3.

⁷Ehrlich, in De Bell, p. 220.

one will bump up against (or live above or below in gigantic apartment complexes); of feeling bombarded by the increasing noise such a crowded environment creates; of feeling anxious about whether tomorrow will bring a further curtailment in provisions or a temporary reprieve; of feeling hopeless about the future for oneself and for one's children. The whole question of whether there should be any more children and if so, whose, is one that confronts those wrestling with the population aspect of the ecological crisis. These and other moral dilemmas will be discussed in the section on proposed solutions.

Ecological Disasters and the Pollution Problem

A few short years ago Lake Erie was considered to be virtually dead as far as life forms within it are concerned, due to the dumping and leakage of polluting materials from industrial firms along its shores. In Los Angeles the smog is so bad that 10,000 people a year are advised by their doctors to move elsewhere. The death rate in America from bronchitis and emphysema is nine times as high as it was twenty years ago, and the cause can be found almost totally in the pollution of our air by automobiles and factories. It has been estimated that the United States emits 188.8 million tons of pollutants into the air yearly.⁸

It is apparent that to produce many of the goods we want, we also produce, as a by-product, polluting, poisonous waste material that endangers the air we breathe, kills the soil in which we grow our food, and poisons the water we drink. In the late 1970s, the human tragedy of pollution was revealed in the case of a small community in Buffalo, New York, known as Love Canal. A chemical plant there had been dumping its chemical wastes into an area surrounded by residential homes for years. When a much higher than normal rate of still-births, cancers, and other medical illnesses struck the residents of Love Canal, they and the nation became aware of the stark dimensions of the pollution problem.

Many communities around the world, some stretching for miles along exposed beach areas, are also aware of the pollution problem through the presence on their shores of tons and tons of spilled oil. The ecological damage done to the shores of northern France by the crack-up of the oil tanker Torrey Canyon in 1967 has been said by some to be inestimable. Not only are beaches ruined for years, but the long-range effects on bird and sea life are devastating.

Efforts have been started in many communities to clean the air of its poisonous fumes. Manufacturers have been encouraged and in some cases

⁸William Steif, "Why the Birds Cough," in *The Ecology Controversy*, eds. Gary E. McCuen and David L. Bender (Anoka, Minn.: Greenhaven, 1970), pp. 56-61

compelled to "scrub" the gases and exhausts emitted from their factories. Automobile makers have been required to produce devices that will burn gasoline more cleanly and efficiently. In some areas, dirty burning fuels such as coal have been replaced by cleaner fuels such as natural gas, oil, or nuclear power. But each of these efforts has consequences that are not palatable to everyone. The more money invested in cleaning the air emitted by a factory, the more the items it produces will cost the consumer. Switching to cleaner fuels means, in many cases, switching to resources dangerously near depletion or that have their own ecological dangers, especially nuclear-based energy.

Some ecologists even look beyond the immediate danger of individual pollutants to the potential disaster of "heat death." In the first half of the twentieth century, the earth underwent a marked rise in temperature compared to preceding decades. According to different estimates, human activity currently accounts for a net heating-up of between 1/2500 and 1/25 of the proportion of energy reflected back into outer space from the earth's surface. A 10 percent increase would turn the North and South Poles into tropical areas and would render the present tropics uninhabitable except for lizards and insects. On the other hand, some people argue that polluted air creates a cover through which the sun's heat will have a hard time penetrating, thus foreshadowing a new ice age. In our ignorance, we could be triggering an ice age or a heat death well before we are aware of the clues that would permit a forecast in time to reverse the fatal trend.

Nuclear Radiation

Of all of the man-made dangers that face our planet, one of the most frightening is that of nuclear radiation. One of the great discoveries of the twentieth century was how to get energy from the atom. Once the secret of the nucleus of the atom was unlocked, a bold and exciting future seemed ahead of us. From a relatively small source, enormous amounts of energy could be developed to run virtually all the engines of our society. But rapidly, the horrible side effects of atomic energy also became known. As one of the most eminent scientists involved in the development and production of the first atomic bomb said on watching its first test in the deserts of the southwest: "We have now known sin." The agonizingly brutal deaths of civilians in Hiroshima and Nagasaki emblazoned the sinful dimensions of atomic power on the conscience of the modern world.

When attention was turned to the peaceful uses of atomic energy, its destructive effects were masked behind the invisible radiation being emitted from the nuclear core of the atomic reactors supplying cheap energy. But the hazards were and are still there. These hazards have been described as falling into two broad categories: "The threat of violent, massive

releases of radioactivity or that of slow, but deadly, seepage of harmful products into the environment."⁹

There is, of course, much debate about the relative and absolute safety of nuclear power plants. In defense of their plans to build a nuclear power plant in Minnesota, the Northern States Power Company claimed that their nuclear plant would add only 5 millirems a year, about the same amount as watching TV 1 hour each day for a year.¹⁰

Critics in reply to NSP's arguments state that radiation biologists "regard all radioactivity as harmful."¹¹ In particular, critics argue that even a very low level of continual radiation from waste material results in leukemia. In nine counties downstream from the Hanford, Washington, atomic energy plant, cancer increased 53.2 percent since the atomic reactor went into operation. Counties away from the river had no change in their cancer incidence.¹² Many of the organisms living in the waters into which the radioactive wastes are dumped soak up large amounts of radioactive isotopes in their tissues. Because of the ecological web, these organisms may eventually find their way into food supplies for animals and ultimately human beings.

Much more dramatic in the arsenal of arguments against the safety of nuclear reactors have been the actual incidents in which safety barriers have broken down. In 1979 America, and the world, was mesmerized for weeks by the threatened "melt-down" of the nuclear core at the Three Mile Island plant near Harrisburg, Pennsylvania. Although supporters of nuclear power point out that the melt-down did not, in fact, occur, critics say that adequate safety standards were not enough to keep it from almost occurring. They also point to a long list of safeguard failures at nuclear plants around the world. Most frightening to many people who live in the vicinity of large nuclear reactors is that the effects of their exposure to radiation are long-term and will not be fully known until it is too late to remedy or counter them.

Disposing of the radioactive waste material is one of the crucial problems of nuclear power. In some cases, the natural decay of harmful waste may take up to 1,000 years. It would take five cubic miles of water to dilute the waste from just one ton of fuel to a safe concentration. And the techniques of disposal fill many with apprehension. As two writers described it:

⁹Richard Curtis and Elizabeth Hogan, "The Myth of the Peaceful Atom," in McCuen and Bender, p. 24

¹⁰Northern States Power Company, "Perspective on Safety at NSP's Monticello Nuclear Plant," in McCuen and Bender, p. 48-49.

¹¹Grace and Andrew Gibas, "Radioactive Wastes in Drinking Water," in McCuen and Bender, p. 39.

¹²Gibas, in McCuen and Bender, p. 39

These huge quantities of radioactive wastes must somehow be removed from the reactors, must—without mishap—be put into containers that will never rupture; then these vast quantities of poisonous stuff must be moved either to a burial ground or to reprocessing and concentration plants, handled again, and disposed of, by burial or otherwise, with a risk of human error at every step.¹³

The Depletion of Natural Resources

Although the list of ecological disasters could be extended indefinitely, one potential disaster that has directly affected most people in the Western world, and indirectly the international community, has been the imminent depletion of major energy resources. Anyone who remembers the oil embargo of 1973, the recurrent shortages of oil and natural gas, and the rapidly escalating cost of these fuels is fully aware of how precariously most modern nations are balanced on the edge of major fuel shortages. The energy crisis, as it has come to be called, was so serious that a president of the United States called its solution the moral equivalent of war.

Predictions vary widely on when the world will run out of oil and natural gas, two of the major fuels used for industry and personal needs. Some say the end of the 1980s, other say we can hold on with new discoveries until the beginning of the next century.¹⁴ But nearly every responsible person agrees that there is only a finite amount of oil and gas and that if we continue to deplete it at current rates it must someday run out. Oil and gas are nonrenewable energy resources: they do not recreate themselves nor can they be recreated simply by human effort. Once they are gone, they are gone.

Other sources of energy (as we shall see shortly) have been suggested, but the transition time needed to enable society to utilize them will be lengthy and costly. Even if new pools of oil and gas are discovered, they are likely to be both very expensive to tap and, at best, a temporary solution. It has become clear to many energy experts that although investigating new energy resources, especially solar power, is essential, conservation is also mandatory. But conservation is costly as well, at least in terms of current and anticipated life styles for many in the Western world.

Increasing population, chronic pollution, the threat of nuclear radiation from peaceful as well as hostile uses, and rapid energy resource depletion are all warning signals to a crowded planet that it must take care of its ecological requirements if it wishes to survive beyond the next few generations. As frightening as these signals are, the ingenuity of human invention and the deep resources of moral reflection are responding to the chal-

¹³Curtis and Hogan, in McCuen and Bender, p. 29.

¹⁴See Richard Barnett, *The Lean Years: Politics in the Age of Scarcity* (New York: Simon and Schuster, 1980).

lenge in exciting and hopeful ways. It is to some of these proposals that we now must turn.

ECOLOGY, POLITICS, AND ECONOMICS: MORAL ALTERNATIVES

One of the first things to strike someone wading through the various moral alternatives to the present state of ecological danger is the interweaving of concern for the environment, with reflections on and suggestions for change in the political and economic structures of society. This should occasion no surprise since so much of our ecological problem has political and economic roots and consequences, though it is not necessarily easy to lay the blame at the doorstep of a *single* political or economic system.

A social order that encourages, or at least does not discourage, individuals who support a transportation system that relies on heavy consumption of fuel for private automobiles has clearly made a political and economic decision that has consequences for how fast oil is consumed. This is only one example of the way ecological considerations are entwined with political and economic realities. The intervention into one area will therefore have deep effects on the other areas as well.

Reliance on Free Enterprise

One proposed solution to the ecological crisis is to encourage the political and economic systems that, through free enterprise, have brought technology to its present sophisticated state. If technology has helped create the crisis, then it can be used to extricate us from it. More ingenious ways of extracting fuel from the ground, air, sun, or field can be devised if we will permit the scientific and business interests to pursue their self-interests without control or regulation from governmental bureaucracies. "Actually," claims Gary Allen,

"our technology is the best hope for ending pollution and continuing to expand the food supply. Great strides are already being made toward solving these problems. . . . Our free technology can easily meet the demands of population growth! . . . It is true that some businesses . . . polluted air and water in their search for the cheapest way to dispose of wastes, but the answer to this problem is to use our technology to turn those wastes into profit. . . . The biggest pollution problem we face is the pollution by the collectivist Establishment and Marxist revolutionaries of the minds of a once thoroughly independent and free people."¹⁵

¹⁵Gary Allen, "Government Control of the Environment," in McCuen and Bender, pp. 89-90.

In a sense this solution to the ecological crisis simply bypasses the moral dilemmas assumed by the other solutions. It rejects the assumptions that resources are finite, that choices must be made between alternative life styles, that we have more than enough time to undo the deleterious effects of current pollution, overpopulation, nuclear radiation, and resource depletion, and that those who control the consumption and pollution patterns of one part of the world are morally accountable for their effects on other parts of the world. This solution implicitly asks those who adopt it to take a basic risk: if the solution turns out to be wrong, not only will the human race pollute, populate, or nuclearly proliferate itself to death, it may well do so by first exacerbating the unjust distribution of resources and their control and consumption around the world. The moral justification for taking such a risk is that "competent" nations (as demonstrated by their technological superiority and the affluence of their standard of living) have shown their worthiness in being trusted to use the same instruments that brought them success to bring an end to the current ecological imbalance.

Acceptance of No Resolution

Another solution that does not take a particular stand regarding the merits or demerits of the systems that contributed to the ecological problem focuses attention on its possible irresolvability. Because of three basic forces (high population densities, high levels of personal consumption, and a messy technology of production), Nicholas Rescher believes that

we may simply be unable to solve the environmental crisis as a whole: that once this or that form of noxiousness is expelled from one door, some other equally bad version comes in by another . . . the environmental crisis may well be incurable. It just may be something that we cannot solve but have to learn to live with.¹⁶

The moral consequences of Rescher's position will be, as he puts it, "a large dose of cool realism tempered with stoic resignation." This is "gloom without doom." But it is not a denigration of human beings. "Let us not sell man short. We have been in some unpleasant circumstances before and have managed to cope."¹⁷ Concretely, of course, coping will involve a lower standard of living than we now have or expected for ourselves in the future.

Rescher's position does not speak directly to what responsibilities those who now have the lion's share of the world's resources and who consume them most conspicuously have toward the rest of the world. It is possible to accept the inevitability of ecological suicide and decide to live as if there

¹⁶Nicholas Rescher, "The Environmental Crisis and the Quality of Life," in Blackstone, p. 92

¹⁷Rescher, in Blackstone, p. 104.

is no tomorrow. If we are all going to go under eventually anyway, why not live today without concern for solutions that will only affect future generations?

Survival as a Relative Value

This position raises the important moral consideration of survival, especially the survival of unborn generations. One of the persistent themes in much ecological discussion is our generation's obligations to our posterity, most of whom have not yet even been conceived. The survival of individuals, and even of groups, is not a self-evidently, overriding moral virtue. We can easily imagine situations in which other virtues may compel someone to choose not to survive (a soldier in war who heroically offers his life for another, or a pacifist community that chooses to be massacred by an oppressor rather than resist with violence).

Is it as easy to imagine the human race as a whole (through some kind of international forum) deciding that the limitations and degradations that would be the lot of those who inherit the present (irreversible) ecological disaster would be so dehumanizing that it is now its moral obligation to stop reproducing entirely or at least to reproduce at such a rate that race extinction would be a certainty sometime in the future? Such a decision would be unprecedented and could be justified, in part, only on the assumption that the limits of human ingenuity in solving its environmental problems had already been reached. Of course, those moral philosophies that rely in part on the guidance and intervention of superhuman powers could never assume that solutions to problems were absolutely beyond reach. This is particularly true of the Roman Catholic Church's official interpretation of the ethical principles of Thomism (see Chapter 4). Believing that natural law forbids the obstruction of the reproductive organs and believing that God has so ordained the natural law that it can never be obeyed to the ultimate disadvantage of the human race, the Roman Catholic Church has insisted that neither abortion nor birth control is a solution to the population crisis. Because of its faith in the supremacy of a divine being, this moral position is not overly troubled by its nonacceptance by those outside the Church who, in its opinion, leap to expedient and short-range solutions. In a sense, the Church has chosen to view survival as a relative moral value subordinate to the will of God as embodied in the dictates of natural law.

SURVIVAL AS A FUNDAMENTAL MORAL DILEMMA

We come here to the fundamental moral dilemma. If, both biologically and psychologically, the need for survival is basic to

man, and if survival is the precondition for any and all human achievements, and if no other rights make sense without the premise of a right to life—then how will it be possible to honor and act upon the need for survival without, in the process, destroying everything in human beings which makes them worthy of survival? To put it more strongly, if the price of survival is human degradation, then there is no moral reason why an effort should be made to ensure that survival. It would be the pyrrhic victory to end all pyrrhic victories. Yet it would be the defeat of all defeats if, because human beings could not properly manage their need to survive, they succeeded in not doing so. Either way, then, would represent a failure, and one can take one's pick about which failure would be worse, that of survival at the cost of everything decent in man or outright extinction.

Daniel Callahan, "Population and Human Survival," in *The Population Crisis and Moral Responsibility*, ed. J. Philip Wogaman (Washington, D.C.: Public Affairs Press, 1973), pp. 50–51.

Daniel Callahan is director of the Institute of Society, Ethics and the Life Sciences. A Roman Catholic layman and philosopher, he was editor of Commonweal during 1961–1968 and has written extensively on ethics in the fields of population, contraception, and abortion.

Even contemplating the possibility of choosing against survival is an extreme moral position. Most of the dominant moral positions related to ecology assume some sort of responsibility not only for the present generation but for future generations as well.¹⁸ *How* we plan for our posterity by husbanding present resources and their production and consumption is the heart of the present moral debate.

LIFEBOAT ETHICS

One of the best known, and to some most troubling, of the stands taken in the debate has been set forth by the eminent microbiologist and geneticist, Garrett Hardin. His moral position, known as "lifeboat ethics" has been set forth compellingly in two major pieces, "The Tragedy of the Commons,"

¹⁸Joel Feinberg, "The Rights of Animals and Unborn Generations," in Blackstone, pp. 64–67

and "Living on a Lifeboat." Working from the premise that an unchecked increase in population is not desirable, Hardin claims that the human race must make choices about what qualities of surviving populations it wishes to nurture. Not all qualities are compatible with each other. In particular, free enterprise and the absolute right of free choice are not compatible with a healthy environment. As his telling example, Hardin asks us to picture a pasture open to everyone. If each person is seeking to maximize self-interest, each herdsman will try to place as many of his cattle in the pasture (or commons) as possible. Since his income depends upon the animals he has, it is of direct and immediate benefit to each person to keep adding animals to the commons. The negative effects on the commons, of the overgrazing that is a cumulative consequence of the previous decisions, are shared by all and thus are not felt as directly and immediately by each one.

The rational herdsman concludes that the only sensible course for him to pursue is to add another animal to his herd. And another; and another. . . . But this is the conclusion reached by each and every rational herdsman sharing a commons. Therein is the tragedy. Each man is locked into a system that compels him to increase his herd without limit—in a world that is limited. Ruin is the destination toward which all men rush, each pursuing his own best interest in a society that believes in the freedom of the commons. *Freedom in a commons brings ruin to all.*¹⁹

Hardin concludes that "so long as we behave only as independent, rational, free-enterprisers," we will be locked into a system of "fouling our own nest."²⁰

Having shown that unqualified insistence on the right to graze without limits on the commons leads to disaster for all, Hardin then turns to the question of what responsibility those who presently enjoy the benefits of the commons have toward those who stand outside it or who have not shown responsibility in their use of it. To do so, he switches to the metaphor of a lifeboat.

Each rich nation amounts to a lifeboat full of comparatively rich people. The poor of the world are in other, much more crowded lifeboats. Continuously, so to speak, the poor fall out of their lifeboats and swim for a while in the water outside, hoping to be admitted to a rich lifeboat, or in some other way to benefit from the "goodies" on board. What should the passengers on a rich lifeboat do? This is the central problem of "the ethics of a lifeboat."²¹

¹⁹Garrett Hardin, "The Tragedy of the Commons," *Science* 168, (Dec. 13, 1968), pp. 1243-1248, © 1968 by the American Association for the Advancement of Science as found in *The Environmental Handbook*, ed. Garrett De Bell (New York: Baltimore, 1970), pp. 36-37.

²⁰Hardin in De Bell, p. 39

²¹Garrett Hardin, "Living on a Lifeboat," in *Religion for a New Generation*, 2nd ed., eds. Jacob Needleman, A. K. Bierman, and James A. Gould (New York: Macmillan, 1977), p. 241.

It is assumed that each rich lifeboat has a "safety factor," a gap between what it now holds and what it could conceivably hold but which, unfilled, permits some flexibility to respond to ecological alteration. What Hardin wants to argue for is an ethic opposed to sharing the "goodies" of the lifeboat with anyone not presently on board.

He is clearly aware that his moral position is "abhorrent" and "unjust" to many people. But the alternatives, he argues, are suicidal. He is particularly critical of the ethic of sharing, which he identifies as Christian or Marxist ("from each according to his abilities to each according to his needs").

The problem of the rich lifeboat is essentially its population. If those on board represent nations whose population doubles every eighty-seven years and those on poorer lifeboats represent nations whose doubling time is twenty-one years, sharing would soon require each original person on the rich lifeboat to share with eight new persons added from the poorer boats. "How could the lifeboat possibly keep afloat?"²²

Each person born into the poorer nations "constitutes a draft on all aspects of the environment." It is one more person taking up valuable space in the rich lifeboat and narrowing dangerously the safety factor as well as diminishing the goods available to its original inhabitants. "Every life saved this year in a poor country diminishes the quality of life for subsequent generations."²³ Thus, to keep alive people in poor countries who are taking no responsibility to curtail their population growth or to grow their own food will produce ruination in the commons. To admit these people as immigrants into the richer nations would place an "unacceptable burden" on the minority of people who conscientiously want to plan for their children's and grandchildren's futures. "We cannot safely divide the wealth equitably among all present peoples, so long as people reproduce at different rates, because to do so would guarantee that our grandchildren—everyone's grandchildren—would have only a ruined world to inhabit."²⁴

To those who feel guilty about having been born into a rich lifeboat and who feel qualms about not sharing with those outside it, Hardin says simply:

Get out and yield your place to others. Such a selfless action might satisfy the conscience of those who are addicted to guilt but it would not change the ethics of the lifeboat. . . . The net result of conscience-stricken people relinquishing their unjustly held position is the elimination of their kind of conscience from the lifeboat. The lifeboat, as it were, purifies itself of guilt.²⁵

²²Hardin, in Needleman et al , p. 243.

²³Hardin, in Needleman et al , p. 249.

²⁴Hardin, in Needleman et al , p. 252.

²⁵Hardin, in Needleman et al p. 242.

It is important to note that Hardin's argument relies heavily on the desire of individuals not only to survive but to survive as far as possible in the style to which they have become accustomed. Having assumed the supremacy of that value, his position falls into place as a reflection on the consequences of trying to act on some other basis. Ultimately, to avoid the the worst aspects of a lifeboat existence, Hardin believes that we must accept some kind of coerced behavior. "Freedom to breed will bring ruin to all."²⁶ If the rich nations are to control the population of the poorer countries, to instill in them, as it were, a responsible form of behavior, they must infringe on the freedom of these less well-off people around the world. This may well be unfair and unjust, but "the alternative of the commons is too horrifying to contemplate. Injustice is preferable to total ruin."²⁷

The Right to a Livable Environment

Placing limits on the right of free choice is echoed by William Blackstone in his discussion of how to balance that right against what he calls the "right to a livable environment." If a human right is one that is essential in permitting persons to live a human life, to "fulfill [their] capacities as rational and free beings,"²⁸ then the right to a livable environment could be conceived as a right "which has emerged as a result of changing environmental conditions and the impact of those conditions on the very possibility of human life and on the possibility of the realization of other rights such as liberty and equality."²⁹ If pursuing unrestricted individual freedom will result in the tragedy of the commons, then some priority of rights must be made. Blackstone believes strongly that "both public welfare and equality of rights now require that natural resources not be used simply according to the whim and caprice of individuals or simply for personal profit."³⁰

Spaceship Earth

One model for understanding how such limits on individual freedom might work and still provide a tolerable world community is that set forth by Kenneth Boulding in his image of "spaceship earth."³¹ On the one

²⁶Hardin, in De Bell, p. 49.

²⁷Hardin, in De Bell, p. 47.

²⁸Blackstone, in Blackstone, p. 31.

²⁹Blackstone, in Blackstone, p. 31.

³⁰Blackstone, in Blackstone, p. 32.

³¹Kenneth Boulding, "The Wisdom of Man and the Wisdom of God," *Human Values on the Spaceship Earth* (New York: National Council of the Churches of Christ in the U.S.A., 1966).

hand, Boulding claims, "there seems good reason to suppose that human life will be lived in a comfortable and need-satisfying environment, in which everyone will have enough to eat, agreeable surroundings, and a rich variety of experience." On the other hand, in order to achieve this kind of life

we have to visualize the earth as a small, rather crowded spaceship, destination unknown, in which man has to find a slender thread of a way of life in the midst of a continually repeatable cycle of material transformations. In a spaceship, there can be no inputs or outputs. The water must circulate through the kidneys and the algae, the food likewise, the air likewise, and even though there must be inputs of energy . . . there can be no inputs or outputs of material, short of the transfer of energy into matter. . . . [This means that] there must be extreme parsimony in all matters pertaining to irreversible change.³²

The ethic that such parsimony requires is one that will demand poverty of spirit, even in the midst of material affluence; purity of heart, "or the corruption of affluence will engulf us."³³ How we can acquire such an ethic, Boulding believes, will demand attention to sources outside the traditional ethics of the biblical religions of the West. As we explore what this new ethic might look like, we will be moving into the most original, challenging aspects of the ecological moral debate because we will be encountering assumptions and conclusions that strike at the very heart of what Western society has taken for granted about what it values.

DEEP ECOLOGY AND ASIAN WISDOM

Boulding, and many others, are now looking to Eastern or Asian religions to find an alternative attitude toward nature that may help us to restore ecological sanity. Believing that "what we do about ecology depends on our ideas of the man-nature relationship,"³⁴ many contemporary ecology-minded moral philosophers are finding in Asian religions a reverence for nature that restricts man's exploitation of it. The dualism that separates man from nature has always been suspect in Asian thinking. To set one thing off against other things is to violate the oneness that ultimately permeates everything. The Asian tradition can point to the accumulated frustrations of always trying to place the ego above or in opposition to other forces in the universe. Separation from something leads to a desire to conquer it so that it will not pose a threat. Only if we can understand our fundamental unity with all things can we exist in peaceful harmony with them.

³²Boulding, pp. 6-7.

³³Boulding, p. 13.

³⁴Lynn White, Jr., "The Historical Roots of Our Ecological Crisis," in Needleman et al., p. 238.

This sense of oneness with nature has led to the development of what one writer has called "the deep ecology movement."³⁵ It is based on a vision of the person-in-nature.

The person is not above or outside of nature. The person is part of creation on-going. The person cares for and about nature, shows reverence toward and respect for nonhuman nature, loves and lives with nonhuman nature, is a person in the "earth household" and "lets being be," lets nonhuman nature follow separate evolutionary destinies.³⁶

Devall identifies the sources of this movement as the Eastern spiritual traditions associated in the West with the writings of Alan Watts and D. T. Suzuki, the rediscovery of native American religion and philosophy, and some of the mystical and "minority" philosophical traditions of the West. These sources combine to produce not just a new set of values about the earth but, according to the proponents of deep ecology, a whole new consciousness about existence. What is needed, says Paul Shepard, is "a scope or a way of seeing [that] must take a long view of human life and nature as they form a mesh or pattern going beyond historical time and beyond the conceptual bounds of other humane studies."³⁷

The result of such a new viewing is to begin thinking not exclusively from a human point of view but trying to "think like a mountain." From such new thinking Devall believes that a number of principles essential to deep ecology will emerge. Lynn White refers to St. Francis' notion of "a democracy of all God's creatures" in which man is deposed from his monarchy over creation and can say "brother" or "sister" to ants, rocks, wind, and rain without having to control their destinies.³⁸ As Devall puts it, "Man does not perfect nature, nor is man's primary duty to make nature more efficient."³⁹ The principles Devall believes will emerge are the following:

1. A new cosmic/ecological metaphysics that stresses the identity (I/Thou) of humans with nonhuman nature, a form of "biological egalitarianism."
2. An objective approach to nature in which nature is treated not simply as an extension of human needs.
3. A rejection of subject/object, man/nature dualisms and their replacement by a new awareness of the "total intermingling of the planet earth."

³⁵Bill Devall, "The Deep Ecology Movement," *Natural Resources Journal* (Albuquerque: Univ. of New Mexico School of Law, n.d.).

³⁶Devall, p. 303

³⁷Paul Shepard, "Introduction: Ecology and Man—a Viewpoint," in Shepard and McKinley, pp. 1-2.

³⁸White, in Needleman et al, p. 238.

³⁹Devall, p. 303

4. Science should become a *contemplation* of the cosmos and not an instrument for its exploitation.
5. There is wisdom in the stability of natural processes unchanged by human intervention.
6. The quality of human existence should not be measured only by the quantity of products.
7. Hunting and gathering societies can provide principles for healthy, ecologically viable societies.
8. Diversity is desirable both culturally and as a principle of health and stability of ecosystems.
9. Life styles should strive for spiritual development and community rather than for consumerism.

To be relevant to moral thinking, of course, these principles must have consequences for our behavior in the world. Many of those in the deep ecology movement see the economic and political implications, in particular, of adopting a new ecological consciousness. Devall enjoins us to scrap most of our heavy reliance on industrial technology for an "appropriate technology" that will reduce consumption, use less energy, encourage diversified, organic, labor-intensive production. To accomplish this, he argues, we need to decentralize power politically and nurture local autonomy in our political and economic systems.⁴⁰

Buddhist Economics

A trained economist who also sees the economic implications of some of the deep ecology movement is E. F. Schumacher (see Chapter 14 regarding his contribution to some of the moral problems in the economic arena). Drawing explicitly on the principles of Buddhist economics, Schumacher develops a conception of work that is not guided by ever-increasing production. Instead, from a Buddhist point of view, the purpose of work is "to give man a chance to utilize and develop his faculties; to enable him to overcome his egocenteredness by joining with other people in a common task; and to bring forth the goods and services needed for a becoming existence."⁴¹

The ecological implications of this understanding of economics are striking. Material consumption (which requires depletion of so much of the earth's resources and, in production, often pollutes and endangers public health) would not be the goal of economics. "Since consumption is merely a means to human well-being, the aim should be to obtain the maximum of well-being with the minimum of consumption."⁴² This means a modest

⁴⁰Devall, pp. 310-313.

⁴¹E. F. Schumacher, "Buddhist Economics," in Needleman et al, p. 218.

⁴²Schumacher, in Needleman et al, p. 219

use of resources. One side benefit of this reduced level of consumption would be a decrease in violence between persons and nations since they would have no reason to fight to accumulate resources. "Equally, people who live in highly self-sufficient local communities are less likely to get involved in large-scale violence than people whose existence depends on worldwide systems of trade."⁴³ A Buddhist economics would also insist that "a population basing its economic life on nonrenewable fuels is living parasitically, on capital instead of income."⁴⁴

A DISSENTING OPINION

But "reverence" for the natural and "skepticism" about modern technology [reveal] the least noticed yet most fundamental fault in the renewed interest in ecology, namely, a romanticism that distorts the issues, needlessly arouses opposition, and is positively inimical to wise, deliberate control of the environment. . . . I should want to argue that nature is neutral with respect to ultimate wisdom or rationality, and also neutral with respect to virtue or goodness. . . . Nature is a realm of struggle, often savage, brutal struggle, where the big fish eat the little ones. . . . When people lose their capacity for surmounting nature, we say they "vegetate." . . . The problem is not to roll back the ages to the state of nature, but to exercise more careful human control over technology so that it does really serve as liberator. . . . Perhaps we may say that man evolves along with the nature of which he is a part, yet ever more as himself the controlling factor in that evolutionary process, so that the story becomes one mainly of the evolution of *man*. Man is part of nature, and yet he is not; and in that tension he finds his existence.

Thomas Derr, "Man Against Nature," *Cross Currents* (Summer 1970), as found in *Religion for a New Generation*, eds. Jacob Needleman, A. K. Bierman and James A. Gould (New York: Macmillan, 1973), pp. 182–184.

Thomas S. Derr (b. 1931) is a member of the faculty at Smith College and author of The Political Thought of the Ecumenical Movement, 1900–1939. He has written many articles in the area of social ethics.

⁴³Schumacher, in Needleman et al., p. 220

⁴⁴Schumacher, in Needleman et al., p. 221.

WHAT CAN BE DONE?

Even those who do not fully accept the Eastern foundations of deep ecology or all of the latter's principles feel that some changes are inevitable and desirable in the economic practices of Western nations. Americans consume far more than their share of the world's resources. If they are to contribute to the solution of our ecological problems, their economic practices will have to be modified in some serious way. At the very least, argues Robert G. Burton, "it is in the general interest for us to modify our economic practices so as to include the cost of waste disposal and the recycling of such resources as air and water in the total cost of production. This would amount to the tempering of the profit motive by the principle of equal rights for all."⁴⁵ The effects on the environment must be just as much a concern of the economic process as its ability to satisfy individual consumer demand.

Keith Murray has proposed an "ecological platform" that would, among other things, alter political and economic practice to include public provision of birth control information and devices, foreign aid only to countries with programs of birth control, a guaranteed annual income (thus breaking the "compulsory link between jobs and income that has been a principal stimulus to growthmanship" in the economy), government purchase of control of land for the purpose of preservation, massive investment in environmental and ecological education, economic incentives and punishments to discourage the dumping of waste material and the polluting of air and water, and the return of farm land to the small farmer away from gigantic agri-businesses.⁴⁶

Biologist and political activist Barry Commoner has been in the forefront of those arguing for massive federal transition from private corporate reliance on nuclear and nonrenewable fuel resources to democratically controlled use of solar power.

If the heavy burden of the energy crisis on consumers is to be relieved, the present energy system must be replaced by one based on a source that is renewable (so that its price is stable), thrifty in its demand for economic resources (so that consumers can have access to their share), and benign in its effect on the environment (so that people can live in it without fearing for their health and safety).⁴⁷

A solar-based system could deliver energy in a variety of forms: in forests, from wood; in agricultural areas, as alcohol made from grain or methane made from manure or plant residues; in rainy, mountainous areas, as hydroelectric power; in moderately or intensely sunny places, as photovol-

⁴⁵Robert G. Burton, "A Philosopher Looks at the Population Bomb," in Blackstone, p. 115.

⁴⁶Keith Murray, "Suggestions Toward an Ecological Platform," in DeBell, pp. 317-323.

⁴⁷Barry Commoner, *The Politics of Energy* (New York: Knopf, 1979), p. 68.

taic electricity; in windy places, as wind-generated electricity; almost everywhere as direct heat.⁴⁸

In the area of food production, some are now calling for an end to its dominance by multi-national corporations that have discouraged the growing of food by local producers for local needs. Food scarcity, argue Frances Lappe and Joseph Collins, is really due to economic decisions to use arable land around the world to grow things at a profit that ultimately only the rich can afford and that are not necessary to a basic diet. They argue for a return of arable land to local, democratically organized units that can grow the necessary basic foods for local consumption. The economic consequences of their proposals obviously hit hardest at systems based on unlimited corporate decisions to produce only on the basis of what will secure the highest profit, regardless of consequences to the soil and to the poor who have only the soil on which to rely.⁴⁹

FOOD SELF-RELIANCE

As one writer summed up the tragic reality of so many underdeveloped countries, "the small farmer sells the nitrogen, phosphorus, potassium, and trace minerals from his soil in the form of tobacco or cotton and in return buys polished rice or noodles from the little . . . store down the road, thus selling the lifeblood of his soil to buy starch and carbohydrates. . . . Basic food self-reliance—and by this we mean adequate local supplies to prevent famine if imports of food were abruptly cut off—is the *sine qua non* of a people's security. Moreover, no country can bargain successfully in international trade so long as it is desperate to sell its products in order to import food to stave off famine.

Frances Moore Lappe and Joseph Collins, *Food First: Beyond the Myth of Scarcity*, with Cary Fowler, rev. and updated. (New York: Ballantine, 1978), pp. 224, 232.

Both Ms. Lappe and Mr. Collins are associated with the Institute for Food and Development Policy and have worked extensively in the field of world hunger, underdevelopment, and economics.

⁴⁸Commoner, p. 54.

⁴⁹Frances Lappe and Joseph Collins, *Food First: Beyond the Myth of Scarcity*, rev., updated. (New York: Ballantine, 1978).

The Automobile

Perhaps for Americans and western Europeans the most tangible part of our lives to be directly affected by moral thinking about ecology is that which relies on the use of the automobile. The automobile alone accounts for a major portion of the pollution spewed into the atmosphere and of the nonrenewable oil depleted to provide it fuel and run the industries that produce it. It is for many people the ultimate symbol of ecological danger, indifference, and wastefulness.

Those who adopt a moral position akin to Hardin's lifeboat ethics might choose to curtail their use of the automobile simply to make their lifeboat more livable once it becomes clear that unlimited freedom to drive a car will result in the asphyxiation of the lifeboat's residents. Those who are attracted more to the deep ecology movement may give up their reliance on automobiles not only because of their catastrophic effect on the environment but also because the car represents or provides nothing of particular value to a simple, nonmaterialistic life style. Transportation could easily be provided by public conveyance while at the same time a simplified life style would not lead to the building of enormous centers for the distribution of goods at great distances from where people live.

Cars use one-half of all oil consumed in the United States. If Americans owned cars that got 60 miles per gallon, the United States would cut in half its net oil imports and save four million barrels of oil per day.⁵⁰ Even those who have not adopted a fully developed moral position as comprehensive as deep ecology or lifeboat ethics can recognize that in a spaceship earth, such consumption and potential savings of the nonrenewable fuels cars demand would be in the self-interest of everyone aboard.

Once one comes to this conclusion, the moral question necessarily emerges: Is it the obligation of the political order to restrict the free choices of some to use as much oil as they can afford in order to save the environment for everybody so that room is left for other free choices to be exercised humanely? If some restrictions are necessary, can they be enacted without wholesale replacement of the values that undergird the present economic system? If wholesale replacement is necessary, can it be accomplished peacefully and gradually? If only adjustments in the present system are necessary, can the environment wait for them to occur?

The ecological situation reveals clearly that individual decisions alone will not be enough to eliminate the potential dangers from pollution, population, nuclear proliferation, and resource depletion. Each person can make choices about what and how much to consume, but private choice by itself will not have a major effect on the decisions of large corporations or governments. At some point, ecological concern will lead individuals to deci-

⁵⁰Amory B. Lovins, L. Hunter Lovins, and Leonard Ross, "Nuclear Power and Nuclear Bombs," *Foreign Affairs* (Summer 1980), p. 1162

sions about political and economic structures. At that point, the concerns of this chapter, in combination with the reflections of Chapters 13 and 14 on politics and economics as fields for moral activity will necessarily lead the student of morality to weigh the various rights and obligations affected by political and economic practice.

It is certainly possible, though by no means inevitable, that some will come to the conclusion that only a thoroughgoing reformation, not only of personal life style but also of the way in which nations produce and consume, is the moral and realistic solution to our problems. But no matter what the degree of reformation in personal and social choices about the world in which we live, we must all confront the question at some point "Is all this glut of power to be used for only bread-and-butter ends? Man cannot live by bread, or Fords, alone. Are we too poor in purse or spirit to apply some of it to keep the land pleasant to see, and good to live in?"⁵¹ If we can consider this question seriously, then we might, in the words of George Macinko,

contemplate the human condition in which the marriage of science and technology little more than a century ago gave man enormous powers, [the condition] which . . . has seen these powers exercised in ways increasingly destructive of the natural order. Perhaps this contemplation might see a controlled and humane use of power replace power used merely for the sake of control. If this comes to pass, then one might even answer affirmatively that not at all frivolous question recently posed by an astronomer, "Is there life on earth?"⁵²

CHAPTER REVIEW

A. Energy and ecology

1. Ecology is the study of the interrelationships of all living things. The moral issues within this area have to do with taking responsibility for actions that will have short- and long-term effects on the ecosystem and the quality of human life around the globe.

B. Four possible areas of danger

1. The present crisis in ecology has been brought about in part by a traditional belief that human beings have the right to exploit an intrinsically valueless nature and to do so in the quest of ever rising standards of living.
2. The population explosion threatens the living space of the world as

⁵¹Aldo Leopold, *Game Management* (New York: Scribners, 1933), p. vii.

⁵²George Macinko, "Land Use and Urban Development," in Shepard and McKinley, p. 382.

well as its capacity to house and feed the billions of persons predicted for the future.

3. Ecological disasters and pollution threaten the health and safety of lakes, rivers, arable land, air, and ultimately human life itself.
4. Nuclear energy poses the danger of increased radiation and the consequent long-term damage to human beings in the form of cancer, leukemia, and genetic damage.
5. The rapid depletion of nonrenewable natural resources, such as gas and oil, threatens the life styles of most of the developed world, which depends on these resources for energy.

C. Energy, politics, and economics

1. Political and economic systems can either encourage or retard the wasteful use of resources and responsible planning with respect to population, pollution, and radiation.
2. Some argue that the free enterprise system will resolve the ecological crisis; others argue that there is no solution and that we must learn to live with the inevitable.
3. Survival at what price becomes a major moral issue in the midst of the crisis.

D. Lifeboat ethics

1. Garrett Hardin has proposed a moral position known as "lifeboat ethics" in which he argues that limitations must be placed on individual freedom of choice if we wish to avoid disaster for all.
2. Hardin also argues that the survival of the richer, more responsible nations may require refusing to share with those nations that have not shown responsibility for ecological planning.
3. Other moralists argue for a right to a livable environment and for an understanding of the world community as a spaceship in which a balance of resources and use must be maintained.

E. Deep ecology and Asian wisdom

1. Asian religious traditions offer to some an understanding of the unity between the human person and nature that may provide a way out of the crisis.
2. In such an understanding, there is a democracy of all God's creatures. Exploitation of nature is replaced by contemplation of it. Life styles should be spiritual, not oriented to accumulation of goods.
3. The "Buddhist economics" of E. F. Schumacher suggests a reduced level of consumption as a means to an increased sense of well-being.

F. What can be done?

1. There are many planks in an "ecological platform" suggesting practical courses of action that can be taken, such as provision of more birth control information, support for public transportation, more reliance on solar power, and encouragement for local, self-sufficient farming.
2. Use of the automobile poses the most immediate and practical problem for most Americans. Reducing reliance on the family car can make a significant impact on the ecological situation.
3. Individuals as well as social systems must respond to the crisis. If human beings cannot live by bread alone, what kind of life styles will be appropriate for persons attempting to be ecologically responsible?

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