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DIMENSIONS OF THE ENVIRONMENTAL CRISIS

by Joseph L. Fisher

Over the last year or two in this country, there has arisen an ecological crisis to go along with the war crisis, the youth crisis, the population crisis, and several other crises. Magazine articles by the dozens have proclaimed it, have analyzed how it came about, and have pronounced doom for the country unless most strenuous efforts are made to prevent it. Supporting evidence is easy to find: the air over our cities is foul much of the time, rivers are polluted as are lakes and bays, solid waste problems have become a monumental headache for virtually every city council in the land, congestion and crowdedness is a nightmare on many highways and in certain parts of our cities, and still other forms of pollution such as DDT-type pesticides and radioactive materials have spread throughout the atmosphere and oceans of the world.

The word "crisis" is not too strong for the present situation and outlook. This seems to be true despite the fact that, compared with conditions in earlier times, the present-day environment in most respects is an improvement. People in this country no longer die from typhoid. Central heating is available nearly everywhere in the wintertime, and more and more people spend their summer in air-cooled homes, office buildings, and factories. The average length of life has increased rapidly in the past century or two, and medical care, despite its high cost, is widely available. A visitor from an Asian country recently remarked to me in astonishment: "Why, you can drink faucet water anywhere in

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your country with perfect safety." It is undoubtedly true that the modern American urban slum, for all its unattractive features, is still a better place to live than most of London in Dickens's time, and that the poorest country town in the Appalachians at the present time offers more than Goldsmith's deserted village.

However this may be, Americans in the year 1970 are deeply distressed by the condition of their natural environment. They are convinced that American technology, financial resources, and managerial know-how are adequate for making substantial improvements. They are impatient that progress be made toward a cleaner environment, and made fast. In this sense the country is in a state of crisis with respect to its environment. If the objective situation is bad, it strikes most people as even worse when viewed against their legitimate expectation of a clean and healthful environment.

More than this, two other attributes of the present crisis situation give special seriousness to the trends that are now running. A few kinds of pollution not only can kill people as well as other forms of life, but can actually harm the genetic materials and thereby distort, perhaps grotesquely, the evolutionary future of the race. Equally foreboding, other kinds of environmental disturbance can undermine the whole ecological support system for life on earth, even to the extent of pulling the rug out from under the future. These matters are not well understood; neither is it possible to assign precise degrees of risk and danger to them. But it appears that a kind of folk wisdom is at work whereby large numbers of ordinary individuals have become apprehensive to the point of feeling threatened in a fundamental way. The environmental crisis, therefore, goes far beyond the inconveniences and nuisances of modern living—the noise, ugliness, and unpleasantness; it goes to the most profound levels of concern about the future of man and the earth.

As with so many of the major problems of society, the precise extent and nature of pollution is not entirely clear. Monitoring systems for air and water pollution, for example, are not as sophisticated or as systematic as would be necessary for a complete and accurate record. During the air-pollution alert along the northeastern seaboard of the country in the summer of 1970, for example, it turned out that although in one major metropolitan area some of the pollutants in the air were being measured at five different monitoring stations with periodic reports directed to a central headquarters, little care had been taken to calibrate the several instruments, and their locations had not been planned with respect to concentrations of pollution. The

resulting information was misleading and led to uncertain public response. To varying degrees the same kind of story can be told about pollution monitoring systems generally. Having noted this, it still seems fair to conclude from careful interpretation of such records as are available that environmental conditions in most respects are worsening in this country, at least in their physical aspects. A brief review of air, water, and landscape pollution will reveal some of the gains, losses, and problems ahead.

Three Kinds of Pollution

In the case, first, of the air, the principal offenders seem to be the automobile and other vehicles that are fueled by oil products in internal combustion engines. Carbon monoxide levels have been increasing in all our cities. Hydrocarbons and lead compounds associated with the automobile have also been increasing. As this is written, legislation in final stages of preparation in a joint Congressional committee calls for reduction of most automobile pollutants to 10 percent of present levels by 1975. The automobile manufacturers have been screaming about this, as might be expected, claiming that because of long-lead times in design, manufacture, and marketing, it is simply not feasible to meet this time schedule. However the matter turns out, a determined citizenry, matched for the moment by forceful political leadership, seems about to turn this particular trend toward pollution in the opposite direction.

A second major contributor to air pollution is industry, and chief among the industries is the conventional fuel-burning, electric-power generating plant which at the present writing is responsible for a large share of the harmful sulfur compounds being injected into the atmosphere and a considerable portion of the ash, soot, and other particles that are the principal visible elements in air pollution. Many of the generating plants have recently installed new and more efficient devices for reducing the amount of pollutants that go up the stacks. In New York City and other places, for example, sulfur emissions are slowly being brought under control and the outlook is promising. But in many places little progress has been made.

A few cities have made gains against air pollution across the board. Notable among them is London where, as a result of national legislation and a determination to enforce regulations, the city has been retrieved after a century and a half of soot and smog. The recent visitor to London cannot help but notice the difference; he is now able to enjoy wintertime in London, the cleaned-up public buildings and

monuments, and songbirds in the parks. Pittsburgh, Saint Louis, and Los Angeles have made determined efforts to reduce air pollution, with some success, but have found it hard to keep ahead of the problem.

The same kind of story could be told with regard to water pollution. In a few places such as the Delaware River Estuary and perhaps the Ohio River conditions may even have improved slightly during the last few years, but in general across the breadth of the land the rivers, lakes, and bays seem to be slowly getting worse. Some of them are actually dying biologically, Lake Erie being the most publicized case. Water pollution is made up of a number of ingredients: organic material such as sewage which demands oxygen for decomposition, a wide range of bacteria, trash, and other solid materials, chemicals of one kind or another depending on industrial processes located nearby, excessive heat discharged into the water from industrial cooling processes and cooling plants, soil that is suspended in the water, and a few others. Each pollutant has its own characteristics and must be understood on its own terms. In addition, the totality of pollutants in a given water-course has to be analyzed if programs of abatement and management are to be effective. The problem is a complicated one and reaches back into the industrial economy, agriculture and land use, municipal water and sewer systems, and into the very attitudes and behavior of citizens regarding their natural environment.

Pollution exists everywhere, but in its modern and more acute form it is found primarily in the urban areas. This is especially true when one includes solid waste, congestion and traffic, noise, poor housing, and general ugliness, as well as air and water pollution. This is not to say that the small town and rural environment are places of surpassing health and beauty. It is simply to recognize the obvious: the densely populated, heavily industrialized cities present the modern environmental problem in its full dimension. Most of our major metropolitan areas have been plagued recently by the problem of coping with their paper, cans and bottles, old automobile frames and other metals, and solid waste generally. A large metropolitan area will generate several thousand tons of solid waste material daily. All of this has to be collected; the principal types of waste material have to be separated; decisions have to be made as to what to reclaim; what to incinerate, what to discharge into the water courses, what to compact and use as land fill. The whole complicated business of solid-waste handling and disposal is best conceived as a system of collection, handling, processing, transport, and final disposal. Numerous trade-offs are possible: Shall paper be reclaimed or burned? Shall metal be recycled in industry as

scrap or be used as land fill or perhaps tossed out to sea and dumped? Shall household garbage be put through disposals into the sewer system and then handled in one or another way, or can it be collected door-to-door and composted? Regarding trash, the final compacted residue has to be dumped someplace: Should sites be sought close to the city where land reclamation would prove valuable but the nuisance might be considerable, or should the stuff be hauled a hundred miles for deposit in abandoned mines, in swamps, in the ocean, or elsewhere? These are questions that have to be answered city by city and call for the most advanced techniques of systems analysis, not to mention political and diplomatic skills, if viable answers are to be found.

Causes of the Environmental Crisis

So much for a general sketch of some of the trends, problems, and approaches to solutions of environmental problems. Where do the causal roots of the polluted environment lead? What are the underlying causes of the situations that have been described? Many believe that population growth is at the bottom of the difficulty. In the last decade population of the United States has increased by 13.5 percent; during the 1950s the increase was 18.6 percent. By the end of this century recent projections indicate about a 50 percent increase, which would bring the total to more than 300 million in the year 2000. As long as population increases rapidly, it is argued, pollution is bound to increase and the quality of the environment deteriorate.

During the last few years fertility rates in the United States have been falling, although, of course, the absolute number of people continues to rise rapidly principally because of the disproportionately large number in the childbearing ages. But the seeds for population stability seem to have been planted. Indeed, recent investigations indicate that if women now had the number of children they say they wish to have, the fertility rate would decline quickly to the long-run replacement level. Whether what women say they want is really what they want remains an open question, but the tendency seems clear: the prospect for the United States now begins to look a little more hopeful and that so far as population is concerned—that is, the sheer number of people—the pollution problem will diminish in severity.

On the world scene, population prospects in the more developed countries are similar to those in the United States; in some cases the outlook is for a considerably lower rate of population increase. In the less-developed countries which comprise two-thirds or more of the world's population, the outlook is by no means rosy. Population in

these places is increasing annually at from 2 to 4 percent, which means a doubling in thirty-six and eighteen years, respectively. In these places the difficulty in feeding larger and larger numbers of people will remain acute.

A second basic cause for the environmental crisis is to be found in economic growth. This, in fact, is much more significant as a cause of the problem than population increase itself. An annual economic growth rate of 4 percent (not far from the average rate of increase of the Gross National Product in recent years) is accounted for by a 1 percent increase in the labor force and a 3 percent increase in productivity (output per man-hour). Production, therefore, and the consumption that follows it predominate over population increase as a source of economic growth in a ratio of three-to-one, and pollution is directly related to production and consumption activities.

Underlying economic growth is technology and the capacity of industry to use it effectively. Pollution clearly is associated with the internal combustion engine, electric-generating plants, fertilizers, jet planes and SSTs, glass and plastics, paper and packaging, and a host of other products that embody particular kinds of technology. The technology which underlies these processes and products accounts for much of the air and water pollution and the solid waste generated by the economy. But by the same token technology also is responsible for the high, and rising, material level of living so much enjoyed by the American people and so much envied by many others in the world. To compound the matter, technology not only leads to pollution but must be looked to for the solution of many pollution problems. The application of new or additional technology to the automobile engine or to the production of fuels offers the principal hope for coping more adequately with air pollution arising from these sources.

Finally and most basic of all, tracing the roots of pollution leads to the behavior of people as producers, consumers, travellers, householders, and in all the other aspects of their lives. Without changes at the level of individual and family behavior it will be difficult, if not impossible, to make large gains in improving the environment. Unless the clean-environment message gets through at this level, progress will be painfully slow. In this sense everyone is involved in both the problem and the solution. Slovenly and disrespectful behavior toward the natural environment characterizes large numbers of Americans; these habits were set at an earlier time when there was a large amount of undeveloped land, forests, and water in this country. The range of behavioral changes that will be needed extends from voting for sewage-

treatment plants and more parks to refraining from driving unnecessarily large automobiles and throwing beer cans out of car windows. It will take a large effort of propaganda and public education to change deep-rooted habits of carelessness.

In the search for scapegoats or villains virtually every group in society has been suspect, including big business, big government, the media with their advertising, engineers, planners, economists, and so on. In fact a few have reached the conclusion that the whole system is wrong; it must be wrong, they assert, because the environment obviously has been allowed to deteriorate to such an extent. The environmental movement has its radicals and its revolutionaries who call for overturning the system and dispossessing the establishment. Their program is ill formed, but the strength of their conviction is undeniable.

Opposed to the radicals, in method more than in ultimate aim, is the much larger number of persons who would work within the system to change the way it works with respect to environmental quality. These people are concerned with establishing new and tighter regulations regarding the discharge of pollutants into the air and water and onto the land. They are concerned with the redirection of research and development so as to prevent and correct environmental damages. They wish to experiment with new kinds of incentives—such as placing charges or taxes on the discharge of effluents—in the hope that industrial plants will recycle or otherwise handle their pollutants in order to reduce the damage they cause. They seek to limit population increase through the family-planning movement, changes in abortion laws, and in other ways.

Ethical Questions

It will surprise no one that environmental issues, in addition to their scientific, technological, economic, and political aspects, also raise significant ethical questions. These are questions of social goals, personal attitudes and behavior, setting and enforcing of standards, providing of incentives to influence both individual and corporate activities, and education and indoctrination of people to think and act along certain lines. A number of types of environmental action have already been mentioned, such as taxes, research, government regulation, management, and education. Each of these raises ethical points. For example, underlying the notion that those who cause pollution should pay the cost is the broader ethical position: those who knowingly cause damage should compensate those who are thereby damaged, in-

cluding society at large if that is where the incidence of damage ultimately falls.

More research and development as a solution to environmental difficulties, like more research on any subject, is essentially unpredictable in its outcome. This is especially true of the more basic kinds of research. The web of interrelations in the natural world is so complex that an investigation which starts out to correct a problem along one line may result in the end in an even greater disturbance to an ecosystem than was originally present. Nuclear research already has yielded not only the destructive bomb but the benefits of electric power and tracer isotopes. The ethical point is: To what extent should technology be encouraged as a solution to environmental problems when the ultimate effect may be to cause more problems than it solves?

The educational approach to understanding and dealing with pollution by changing behavior and providing information on the basis of which wise choices can be made seems completely unobjectionable. However, there is a thin line between education and propaganda for preconceived solutions. Many would say that the present environmental predicament has been overdramatized, far beyond what the facts of the case would justify, in order to mobilize support behind particular actions. The environmental teach-ins, the Earth Day celebration of last spring, marches and demonstrations protesting environmental neglect, it is held, tend to overshoot the mark. Without arguing here whether this is a justifiable criticism, it does uncover an ethical point: To what extent is exaggeration and dramatization justified in a "good cause"? And this, of course, presupposes good causes can be separated from bad ones.

The handling of the reduction of pollution through the establishment of regulations, standards, penalties, and enforcement precedures —which is now the principal approach being followed in this country— has its ethical side also. Compulsion is a frequently misused technique; unless the penalties are fitted nicely to the offenses, administration of the program will surely be difficult and may be impossible. Actions designed to circumvent the regulations and the penalties may be encouraged. It is not easy to find the procedures which can be administered impartially, or the administrators to do the job. Already there is evidence that state and local enforcement programs have fallen unduly under the influence of the industries and groups whose polluting activities are being curbed.

Finally, policies for the limitations of human population, however logical and even necessary for the long run, do raise ethical issues. How

far is it proper to go in deliberately trying to alter individual behavior in such an ultimate and profound matter as having babies? What weight should be given to the uncertainties of side effects that may result from the use of certain kinds of birth control devices? If it is ethical to use education and mild forms of incentives to induce men and women to have fewer children, how far beyond this toward the more compulsive policies may a society go without undue restriction on individual choice? On the other hand, it may be morally necessary to install tough, even compulsive, social controls for limiting population as a means for avoiding collapse of society, or its progressive impoverishment, in the future.

It is not easy to crystallize one's thinking on the ethical dimension of the current ecological crisis. It seems clear that man's relation to nature needs to be redefined in the light of recent trends in both the objective condition of the environment and man's subjective perception of what it means for him. What is the "right" relation? This may involve a redefinition of man's relation to man as well as to nature. Earlier notions of man opposed to nature or man as the exploiter of nature, it seems, will have to be replaced by the more inclusive concept of man in nature or man with nature. As has always been the case, man depends on nature for food, shelter, clothing, transportation, recreation. Nature, now as never before, depends on man whose activities have become determining of nature's future. Man himself, it has been said, has become a geological force in his capacity to work profound changes in the earth and its waters and atmosphere.

The idea of spaceship Earth, so eloquently set forth by Adlai Stevenson a few years ago, is a profound one. Perhaps before long it will be expanded into the idea of the solar system with interconnected planets as a single spaceship. Equally important, but on a much smaller scale, is the idea of spaceship neighborhood or local community which also must be viable and sustainable units although not operating in a self-contained and independent manner. Man and nature must find sustainable and satisfactory arrangements in capsules of different sizes ranging from home and neighborhood to city and the whole world. Each capsule has its own integrity, its own dynamic, evolving character. People will have to learn how to be at home not only in their own homes, but in their cities, their countries, and the world.

It seems to me that an ethics more attuned to ecology is called for—an ethics that recognizes the interrelatedness and interdependence of all living things with the natural environment. Being human beings, we will inevitably focus on man and society, but not on man as the

exploiter of nature who strives to dominate nature. But neither do I advocate an ethics that casts man in a subservient role with man at the mercy of nature. Man's highest calling in these matters may be to understand the human and social ecological systems in which he is centrally involved, to fashion his aspirations and goals out of this understanding, and then so to act that the quality of his natural environment and his own life can move to higher levels. In this the importance of policies, programs, social institutions, and modes of individual thinking and behavior can hardly be overestimated. Sooner or later it will become apparent that the ethical dimension of our much-touted ecological crisis is the important dimension. Every line of attack on environmental problems leads to this. In short, a new ethics of human ecology needs to be fashioned to go with Aldo Leopold's land ethic in which the quality of the natural environment and a sufficiency of food and other resource materials will be placed in the perspective of the rising quality of life itself on this planet toward which all persons will strive.