value of the wheat exceeded the remaining operations of binding (twine) and threshing—all previous costs of raising the crop already had been committed and were beyond recovery. As we approach the absolute yield ceiling for rain-fed wheat I believe we will see also the development of an altered strategy of production based on optimum rather than maximum returns. The input costs of the maximum strategy based on the hope of a bumper crop each year will have to be adjusted to a more moderate approach based on average pragmatic expectations and more in tune with the conservation of energy and resources of the future.

In Fig. 1 and Table 1 I have provided some estimates that show one scenario for wheat production in New York. These estimates have been arrived at by considering the range of possibilities as they seem today. For example, I believe the present level of production of approximately 40 bpa is high enough to raise the possibility of a 10-year yield average that does not exceed it (*6*)—just as in the earlier decades of little change in productivity. On the other hand, I must believe my research data which show Ticonderoga, Houser, and newer wheat lines to be higher yielding than those now in production. At the other extreme, what might be the ultimate yield ceiling under rain-fed conditions in New York? Sixty bushels per acre average for the state? If this is possible it still remains a goal beyond my vision today. From these and other considerations I have projected a level of approximately 50 bpa and have allowed four decades to reach it. Bear in mind that the level must be maintained over a 10-year period. At this point the increase in productivity will become essentially a horizontal straight line when drawn through the fluctuating annual points.

This represents a 27 percent increase in wheat production per acre over our last decade level of 39.3 bpa—a handsome increase, indeed. (Remember that the actual production of wheat in New York in 2015 will depend on many other factors; in fact, New York might not be growing wheat at all.) This prospect must be balanced by the knowledge that the (world's) people production will be between 7 and 8 billion, essentially a 100 percent increase.

Conclusions

In conclusion, I am aware that the favorable data on wheat productivity I have presented for New York through 1975 do not support my gloomy conclusions and prognosis for the future. Nevertheless, I strongly believe that my interpretation of an approaching yield ceiling is valid and that the Malthusian divergence of food production and people production rates will widen. I am not writing of the end of productivity gains—these will continue for an unknown time—but of a slowing in the rate. At the same time, agricultural production will inevitably decline so long as the urbanization and life-support pressure of people on the environment remains unchecked. We must remember, however, that a favorable or desired trend in population stabilization must be sustained for something like 70 years for the entire population to reach equilibrium throughout its age structure.

Foreign affairs of the future will be deeply affected by the outcome of the food-people problem. What I have presented here can be but a small input into the global mix and I hesitate to draw any conclusions because of the kaleidoscopic nature of the world food situation. For example, there are countries that have yet to reach the point at which agricultural yields "take-off," and others that will never reach that point. Nevertheless, I suggest to those whose business it is to make projections on the world stage that absolute limitations to food production loom in the future. We have been surprised at the rapidity with which the energy crisis, the depletion of fossil fuel supplies, came upon us. It would be tragic indeed for this to be repeated with food. The bicentennial of Malthus's paper will be in 1998. Let us hope that by that date the problem, if not the solution, will be much clearer.

References and Notes

1. N. F. Jensen, in *Man and the Ecosystem* (proceedings of 1968 symposiums and seminars), R. M. Klein, W. W. Christensen, F. O. Sargent, Eds. (Univ. of Vermont Press, Burlington, 1971), pp. 11–25.
2. The newest variety, Houser, is not included in Table 2.
3. The conversion factor for bushels per acre to kilograms per hectare is 68.2.
4. In a crisis it is assumed that national resolve would provide suitable incentives needed for maximum production.
5. The U.S. Department of Agriculture's World Collection of Small Grains, for example, contains more than 37,000 wheats—each a potential parent.
6. In fact, yield estimates for 1976 and 1977 are slightly below the previous 10-year average and the prospects for the record low acreage 1978 crop are not promising. As a counter to this, it is well to remember that the strength of superior new varieties is their capability to make disproportionate yield gains in favorable seasons.

The Environment Today

Russell E. Train

In recent years there is very little that has been left unsaid about environmental problems and needs. This is not the same as saying we know all the answers. Our scientific knowledge, in particular, about natural systems and their interreaction remains inadequate. What we do not know still far exceeds what we do know.

What we do know is that the natural systems of the earth appear to be in considerable trouble—a statement that should be taken in the context that I am not by nature a pessimist. A sense of hopelessness would have made the very real environmental progress of the 1970's an impossibility. A major factor in explaining the extraordinary upsurge of public concern over environmental problems in the late 1960's and early 1970's was not simply the growing realization of the seriousness of the problems but a vital new sense that we really did not have to put up with them, that our society had the capability to make significant changes for the better. It appears to be a phenomenon of human history that, no matter how severe a problem may be in fact, it seldom becomes a passionate public cause until there is a widely held conviction that it can be solved.

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The original version of this article was presented as a lecture at the Tyler Ecology Symposium, Los Angeles, 31 March 1978.

0036-8075/78/0728-0320$01.00/0

Summary. While considerable progress has been made in dealing with air and water pollution, the earth's natural systems seem in difficulty. Scientific knowledge of environmental matters remains inadequate. A massive effort to promote solar energy and a national commitment to energy conservation are needed. The Clean Air Act has important implications for economic growth, and the Environmental Protection Agency should emphasize flexibility of administration, decentralization, and close cooperation with state and local governments. Expanded use of coal presents major uncertainties in human health and atmospheric effects. Increasing emphasis on chemical pollutants requires better societal perception of risks and benefits. New efforts to avoid confrontation on environmental issues are promising. Finally, the protection of life in all its diversity is today's urgent environmental challenge.

Solar Energy

The time has come for a comparable upsurge in public demand for a shining new cause, solar energy. We have become accustomed to the premise that solar energy may well become a solution to our energy needs sometime in the distant future but that the reality of the energy problem today demands solution along conventional paths, primarily fossil fuel and nuclear. By postulating the problem in this fashion, research and investment priorities have been tailored accordingly, thus effectively guaranteeing indefinite postponement of solar alternatives while at the same time focusing practically all of our public energies on what seems an interminable and increasingly frustrating debate over solutions to both fossil fuel and nuclear issues.

It is increasingly evident that solar alternatives are not "pie-in-the-sky," but are based on technologies and processes that are widely available. Not only are solar space heating and cooling systems available, but at least one public utility, Public Service of New Mexico, is building a solar power generating plant. Obviously, major research and development needs must be met if solar energy is to fulfill its long-term potential. For example, the production of energy from organic matter, so-called "biomass," deserves a major research priority on the part of the federal government. However, one of the best ways to ensure that these research and development needs are addressed effectively is to get on with the job of applying current knowledge and available technology as widely and rapidly as possible. The opportunity is such that it requires and deserves a major federal program not just of research and development but one which is designed primarily to encourage the nationwide introduction of solar technologies in residential housing, industrial facilities, agricultural processes, waste management, and power generation through tax incentives—including credits, deductions, and rapid depreciation, low cost loans, direct subsidies, technical assistance, and public education. Such a program should have the urgency and the sense of national commitment of the Manhattan Project, which developed the atom bomb, and the Apollo Project, which put a man on the moon. It is the kind of program that would excite the dedication and support of the American people who, I am convinced, are sick to death of debating energy problems and want to get on with the job of solving them.

There will be those who say that solar technologies are not cost-competitive and that the federal government should not get into the business of subsidizing them. To this I would answer that one of the very reasons for the slowness with which solar energy has entered the market place has been the artificially low prices for more conventional energy maintained by subsidy and regulation. In 1976 the average weighted price of the industrial use of energy per million Btu was $2.55 while the average replacement cost—the cost of finding and producing new energy resources—was $3.74. Thus, the replacement cost of natural gas is now more than 70 percent above the average price, that of oil about 45 percent above, and that of electricity nearly 40 percent above. Only in the case of coal has replacement cost approximated actual price. Since our political processes have so far proved unequal to the task of achieving more economically realistic prices for energy, whether by taxes, pricing policy, or by deregulation, or any combination of these, it would seem appropriate for the federal government to provide a direct stimulation for the wide application of solar energy. Under such circumstances, I am confident, its costs would begin to fall quickly and dramatically.

Let me quickly make clear that I am not suggesting that we suddenly turn our backs on fossil fuels and nuclear power. These are going to remain important contributors to our energy needs for many years. Obviously, we need to act aggressively to develop new sources of conventional energy, including outer continental shelf oil and gas and synthetic fuels, as well as to press the greater utilization of coal. What I am saying is that we need to get away from our tunnel-visioned concentration on energy sources that are, by definition, exhaustible and to give a new priority to an energy source—solar—which is renewable, inexhaustible, and benign.

Energy Conservation

Since I have begun by focusing on energy issues, let me add that the most economical, cost-effective and environmentally advantageous way to improve our energy supplies lies in energy conservation. It has been estimated that the 1973 living standard of the United States could have been provided with about 40 percent less energy (*1*). About 60 percent of this estimated saving lay in four areas: space heating and cooling, the automobile, industrial cogeneration of steam and electricity, and commercial lighting. The Alliance to Save Energy estimates that we can make a 30 percent reduction in the energy we waste without having any negative effect on the gross national product (GNP) or jobs.

Conservation alone will not solve our energy problems. However, it provides the only way in the near term by which we can make an appreciable reduction in the ruinous level of U.S. oil imports. Our present trade deficit, almost entirely due to oil imports, is rapidly destroying the value of the dollar abroad, exacerbates inflation and unemployment at home, and threatens collapse of the world monetary system. A national commitment to energy conservation, including biting some very unpopular bullets like higher gasoline taxes, is the only way we can start turning this problem around now.

Environmental Deterioration

It is relatively easy to provide a catalog of the public and private efforts that have already been invested in environmental protection. It is less easy to provide an overall evaluation of what has been accomplished. We have no "environmental quality index" that is really meaningful. The environment is too complex to admit of comprehensive analysis at this stage in our knowledge. The best we can do is to pick out and

assess discrete elements. These tend to be the particular elements of the environment that are the subject of specific regulation, such as air and water quality; and even here our monitoring is very inadequate and there are numerous factors which are not examined at all. In areas that we do not regulate, such as land use, the environmental quality indicators tend to be negative. For example, prime agricultural land is being lost to development at the rate of thousands of acres per day.

Having said all this, I think it safe to say that we have made significant improvements, in recent years, in the quality of our air and water. Since 1970 when the Clean Air Act was passed, sulfur dioxide levels have dropped about 27 percent, carbon monoxide has decreased by 20 percent, and particulates have decreased by 12 percent, according to the Environmental Protection Agency (EPA). Obviously, these averages do not tell the story about particular localities, and, despite the definite improvement in these pollution levels, standards are still being violated in many parts of the country. If one can generalize at all, it would be to say that there has been a significant improvement in air quality nationwide but that the air is still unhealthy in one or more respects in most urban areas—that is, where most people live. (One shudders to think what air and water quality conditions would be in the United States today if tough new environmental requirements had not been adopted in the early 1970's.)

The fact that the photochemical-oxidant standard is being violated in practically every U.S. urban community has implications, not only for auto emissions control and transportation strategies, but for economic growth and development in general. Where an area is already in violation of the oxidant standard, there is an obvious obstacle to the location of new industrial facilities such as refineries, chemical plants, and other new sources of reactive hydrocarbons. The EPA has sought to meet this problem by instituting a so-called "offset policy"—allowing the siting of a new source in a nonattainment region if an offsetting reduction in hydrocarbons greater than the expected addition is achieved in the region. Although the policy has worked reasonably well in a few cases, it is probably too early to judge its overall effectiveness. The fact that there have been so few public issues involving the offset policy makes one wonder whether the policy is being actively enforced. One thing is plain: the whole process of new plant planning, location, and financing can be enormously complicated and full of uncertainties. A major need is to reduce these uncertainties and to shorten the time-frame of the permitting process. Regulatory programs which are otherwise justifiable may become unacceptable in practice if the normal needs of planning and decision-making in the private sector cannot be accommodated.

We have never explicitly recognized the economic growth implications of the Clean Air Act although the problem of siting new industrial facilities in nonattainment areas should help make this clear. Likewise, the regulations designed to prevent significant deterioration in air quality in regions that are already cleaner than the federal standards require have important economic growth and land use implications. The installation of best available control technology, and the aggressive development and introduction of new technologies, together with judicious siting, should go far to accommodate economic development goals with air quality goals. In other words, we can have clean air and a high level of economic activity as well. That is an article of faith of the environmental community which I share up to a point. It would be naive to assume that the necessary technology will always be available, that the necessary advance planning will always have been accomplished, or that bureaucratic process will always operate wisely and expeditiously. Every indication is that the rules are enormously complicated and will become more so. The very complexity of implementation and compliance procedures can create real constraints on economic decisions. It is realistic to expect considerable stress as we seek accommodation between environmental and economic goals, particularly in an era of slower growth. It would make sense to recognize explicitly that there may be limits on particular kinds of growth in particular areas. We continue to shut our eyes to the need for rational approaches to land use, to feel that there is, in fact, something essentially un-American about land use planning. It is time we outgrew this attitude. Rather than looking upon the Clean Air Act as representing an obstacle to development, it should be perceived as a positive tool for development planning and for helping make intelligent choices that reduce risk to human health. In this regard, I believe that it is important for EPA to emphasize flexibility of administration, decentralization of authority to its regional offices, and close cooperation with state and local governments.

Another major concern is the relation of the Clean Air Act to national energy policy and, in particular, to the coal utilization program, which has so many ramifications that I can only touch on a few aspects. Assuming the use of best available technology, it seems likely that the installation of new coal-burning facilities can proceed in most areas of the country without violating standards. At the same time, installation of adequate control technology is going to be enormously costly, amounting to billions of dollars nationwide. In our coal utilization program, the crucial air quality problem is not lack of scientific data, or of adequate technology, but of potentially enormous economic cost. To the extent that the use of coal proceeds without undertaking these controls, our society will simply be accepting new health costs. Nevertheless, the choice before us is not quite so stark. Practical answers can perhaps be found in the timing of the requirements or in directing these primarily to the control of the most toxic pollutants.

Whatever the economic and other problems, it seems inevitable that a massive coal utilization program will contribute to overall loadings of atmospheric sulfates, with a range of adverse effects including the production of acid rain. Present knowledge of the long-range transport of sulfates and their impact is inadequate. Thus, we possess an imperfect scientific basis for predicting either the atmospheric impact of a national coal utilization program or its health and environmental effects. I suspect that these may be more significant than the national energy program has assumed.

Beyond these problems, there is growing scientific concern over the buildup of atmospheric carbon dioxide from the combustion of fossil fuels with potentially significant impacts on global temperature and climate (*2*). All of this suggests that coal (sometimes described as America's energy "ace in the hole") may be a very uncertain foundation upon which to base long-term energy policy. The risk of major shifts in the pattern of world climate with potentially disruptive effects on food production and other human activity could mean that the world will have to turn away from fossil fuels long before usable coal reserves are exhausted. Our first priority in this area must be to develop the scientific data upon which intelligent long-range policy can be based. The Administration's proposal of a United States Climate Program Plan, legislation being considered by the Congress along these same lines, and a World Climate Conference in 1979 are steps in this direction.

In 1976, in testimony before the Senate Foreign Relations Committee, I referred to the potential impact of atmospheric pollution on world climate and suggested that such global effects could well provide a compelling rationale for an international regulatory mechanism with enforcement authority. Such an institution would have to be coupled with, or have access to, a strong scientific capability. In the meantime, the United States has an urgent responsibility to develop the best scientific data on this problem and to choose its energy options accordingly. The fact that the United States, with about 5 percent of the world's population, consumes about 30 percent of its energy, would seem to give us a very special accountability in this regard. Here, again, a national commitment to energy conservation can help buy us the time to do the research that will serve as a base for making intelligent policy choices.

Proponents of nuclear power tend to welcome this catalog of uncertainties concerning the future of coal and other fossil fuels as providing a strong argument for nuclear alternatives. However, I would conclude from the same uncertainties that we still do not have enough knowledge to justify precluding any energy option, including nuclear; but I would also point out that our continuing inability to find acceptable, long-range solutions to the problems of nuclear waste disposal or of nuclear proliferation, either domestically or internationally, represents uncertainties that are no less significant than those affecting coal.

Water Quality

There has been significant improvement in water quality in recent years. Federal, state, and local governments, together with industry, have invested billions of dollars to treat municipal and industrial wastes. As a result, there has been a substantial reduction, particularly on the part of industry, in the discharge of conventional water pollutants as measured by biological oxygen demand (BOD) and total suspended solids. Along with the treatment of wastes has come a major reduction in the use of the oceans as a dumping ground for both municipal and industrial wastes. As a result of these efforts, rivers, lakes, and estuaries around the nation are significantly cleaner than they were a few years ago.

As we have brought the conventional water pollutants under increasingly effective control, most of our success in this regard has been confined to discharges from sewage and industrial pipes, that is, those so-called point sources which are easily identifiable and subject to technological control. Our very success with the control of point sources has highlighted the adverse water quality impact of the so-called nonpoint sources, such as the runoff of soils, fertilizers, and pesticides from farm lands, irrigation return flows, and the runoff from city streets, mining areas, cattle feedlots, and timbering areas. These are among the most significant sources of water pollution in the country, and they are among the most difficult with which to deal. They cannot be reduced by end-of-the-pipe technologies but only by such means as improved agricultural practices.

An even greater problem is the discharge of chemical wastes into our waterways, with potentially significant adverse effects on both human and environmental health. We hear a great deal about such problems because of the greatly expanded use of chemicals by our society, because our technological capability to make measurements at very low levels tends to identify problems which had been previously ignored, and because there is a high degree of public sensitivity to the potential health effects, particularly cancer, from exposure to chemicals. Thus, while we have seen our waterways become progressively cleaner from a conventional water quality standpoint, we have come to recognize that they contain various toxic chemicals that pose a threat both to human health and to the environment. For example, just as we were beginning to congratulate ourselves on the improved condition of the Great Lakes and the Hudson River, we discovered unacceptable levels of polychlorinated biphenols (PCB's) in the flesh of fish caught in those waters. The waters of the James River in Virginia, rich in fish and shellfish, is substantially closed to commercial and sport fishing today because of contamination by highly toxic Kepone, which threatens to spread into the Chesapeake Bay.

Chemical Pollutants

A major public response to the problem of chemical pollutants was the enactment of the Toxic Substances Control Act in 1976. It joins a large number of regulatory acts that deal with practically every aspect of the production and use of chemicals. Public awareness of and concern over the health and environmental effects of chemicals, including their relation to human carcinogenesis, continues to rise. At the same time, our technology for detecting the presence of chemical contaminants continues to improve, so that now it is commonplace to be alerted to the presence of a given substance in parts per trillion which would have gone completely undetected a few years ago. Thus, an administrator, charged as I was at EPA with the regulation of the use of pesticides and toxic substances, is faced with a regulatory load of awesome dimensions. The process for decision-making in this area and the knowledge upon which decisions must be based are highly uncertain. Unlike the Delaney Clause administered by Food and Drug Administration (FDA), the pesticides and toxic substances statutes do not establish a "zero risk" policy and do not call for an automatic ban of a chemical simply because it poses a risk to human health or the environment. On the contrary, those statutes call for regulatory decisions based on an administrative "weighing" of the risks and benefits of the use of a particular chemical. The regulator must establish the existence of risk, usually on the basis of animal tests. While the establishment of human risk on the basis of extrapolation from animal tests has general scientific acceptance, quantifying such risk in terms of human exposure is exceedingly difficult. On the other side of the equation, quantifying the benefits of a particular chemical use (or the costs associated with its nonavailability) pose equally difficult questions. Finally, having arrived as best he can at an assessment of the risks and benefits in a particular case, the administrator must determine whether one outweighs the other and by how much. While in some cases the preponderance of the evidence may be such that a decision is clearly indicated, in most cases the answer is far from clear. How many bushels of corn are worth how many human cancers? How many bales of cotton are worth how much loss of shellfish, or the destruction of how many brown pelicans, or how much disruption of ecosystems?

To complicate matters, the administrative process usually proceeds in a climate of public opinion that tends to focus almost entirely on the risks involved in a particular case. We need more sophisticated public perception of risk in our society as well as a scale to balance risks and benefits in making policy choices. Public understanding is particularly important because there can seldom be a purely quantitative and objective weighing of risks and benefits. When we try to measure a loss of agricultural production against human health, we are

really dealing with a matter of societal choice, rather than with an objective yardstick.

Thus, we need not only more research by health and environmental scientists on the nature of chemical risk, particularly from low-level exposures, but we also need far more work on the evaluation of benefits and on the process of weighing risks and benefits. And we need new approaches to the application of that knowledge to the handling of large numbers of cases. I doubt that either government or industry alone can resolve these needs, and it seems to me that some independent institution that could draw together the interdisciplinary resources of the academic and scientific community might be developed for this purpose. The active participation of government, industry, and public interest groups in such an endeavor would be essential.

Many opportunities exist for different interests to combine their efforts in seeking solutions to common problems. We have become accustomed, however, to public confrontation on a variety of environmental issues, such as the siting of a power plant, a new industrial facility, a highway, a refinery, and the building of a dam. Frequently these confrontations end up in the courts. We live in a society that emphasizes adversary approaches to problem-solving more than any other society in the world.

Whatever the benefits of adversary approaches—and they are considerable, there is a growing recognition today that polarization of issues is largely unproductive. The National Coal Policy Project has brought together environmental and industrial experts to seek common understanding of the major problems involving expanded utilization of coal (*3*). The Conservation Foundation has been instrumental in helping develop areas of agreement between the chemical industry and environmentalists on the regulation of toxic chemicals. A new national organization called RESOLVE has been established by representatives of industry, labor, and environmental organizations to promote the use of mediation techniques in the resolution of environmental conflicts.

I believe that these efforts hold out real promise for narrowing areas of disagreement, for achieving better understanding and appreciation of the problems and needs of the other side, for reaching actual accommodation on some issues, and for developing a more rational approach to dealing with differences before rather than after a situation is deadlocked. I am convinced that the time is ripe for such approaches.

Since undertaking the presidency of the World Wildlife Fund–U.S., an organization dedicated to a global program for the protection of endangered species and their habitat, I have become increasingly concerned that the natural systems of the earth appear to be in serious trouble. The catastrophic tanker wreck off the coast of France in March 1978 is a dramatic example. The full dimensions of that catastrophe in terms of the destruction of a rich fishery, the loss of bird life, including populations of rare seabirds, the loss of a major recreational resource, the damage to wetlands, and the loss of livelihood to the Breton fishermen will not be known for some time, if ever. Every indication is that the wreck of the *Amoco Cadiz* represents an ecological disaster of major proportions.

Even though public attention is gripped by such dramatic accidents, their impact is dwarfed by the progressive deterioration of global natural systems, which has been brought about, for example, by growing human populations, spreading human settlements, the cutting of forests, the deterioration of grasslands, the erosion of soils, chronic pollution, and the overexploitation of fisheries and other living resources. The wet tropical forests of the world are being cut at a rate which it is estimated is contributing carbon dioxide to the atmosphere equal to that produced by the burning of fossil fuels (*4*). Estimates vary but it is likely that two-thirds of all wet tropical forests will be cut by the year 2000. Since about one-quarter of all living species are dependent on those tropical forests, the loss of species will be staggering. Thus, in the short space of 25 years, we will largely succeed in undoing a significant portion of the work of creation accomplished over hundreds of millions of years.

I have spent most of my time over the past several years working on a variety of pollution problems—air, water, and chemical among others. As I review these efforts, I am struck by the fact that the real "bottom line" is the maintenance of life on this earth. Time is running out rapidly on the natural systems of the earth, and particularly on the survival of species. The loss of genetic diversity which threatens everywhere and the resulting biological impoverishment of the planet have grave implications for our long-term future.

We need nothing less than a comprehensive program worldwide to preserve and protect representative ecosystems. It is for this reason among others that Congress today has such a historic opportunity—one which will never come again—to protect for the future major portions of the Alaskan wilderness. Brazil has a comparable and even greater opportunity in the Amazon Basin.

It seems to me that the threat to species and their habitats is so great that the scientific community should make their protection an urgent priority. I remember when the scientific community in the Soviet Union a few years ago successfully mobilized world concern over the pollution threat to Lake Baikal and its rare species of plant and animal life. We now need to arouse a similar determination worldwide. The problems require more scientific attention than they have received. We know little, for example, about the minimum critical size of ecosystems that may be required for the survival of particular species.

Many of the most difficult problems involving the protection of species and their habitats occur in the less developed regions of the world. Many of the human populations most directly involved are faced with a stark struggle for survival against poverty, disease, and malnutrition. The reality is that the number of human beings at the famine level is rising steadily. Environmentalists must recognize that our concerns for the protection of species and habitats can only be pursued within the broader context of worldwide aspirations for the quality of human life. One cannot be separated from the other.

We human beings are relative newcomers on the face of the earth, but we now possess the power of life or death over our fellow creatures. While the scientific and economic arguments for the maintenance of species are compelling, it seems to me that we have an overriding moral responsibility to help preserve the other forms of life with which we share the earth. The gray whales that migrate along the California coast, the elephant slowly moving through the African bush, the peregrine falcon swooping from the sky, these and all the other marvelous products of creation in the sea, in the air, and on the land are at our mercy today. Surely the protection of life in all its beauty and richness and diversity is the most compelling environmental cause of all, and the most urgent.

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