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Zuckerman's Dilemma: A Plea for Environmental Ethics

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Many of us recall from childhood--or from reading to our own children--E. B. White's story of the spider Charlotte and her campaign to save Wilbur, a barnyard pig.[1] Charlotte wove webs above Wilbur's sty proclaiming the pig's virtues in words--"TERRIFIC," "RADIANT," and "HUMBLE"--she copied from newspaper advertisements salvaged by a helpful rat. Wilbur won a special prize at the county fair. Moved by these events, Zuckerman, the farmer who owned Wilbur, spared him from being sent to market. Charlotte saved Wilbur's life.

"Why did you do all this for me?" the pig asks at the end of Charlotte's Web. "I don't deserve it. I've never done anything for you."

"You have been my friend," Charlotte replied. "That in itself is a tremendous thing. I wove my webs for you because I liked you. After all, what's a life, anyway? We're born, we live a little while, we die. A spider's life can't help being something of a mess, what with all this trapping and eating flies. By helping you, perhaps I was trying to lift up my life a little. Heaven knows, anyone's life can stand a little of that" (p. 164).

Charlotte's Web illustrates three ways we value nature. First, nature benefits us. Nature is useful: it serves a purpose, satisfies a preference, or meets a need. This is the instrumental good. Traders have this kind of value in mind when they bid on pork belly futures. Price is the usual measure of the instrumental good.

Second, we may value nature as an object of knowledge and perception. This is the aesthetic good.[2] While the basis of instrumental value lies in our wants and inclinations, the basis of aesthetic value lies in the object itself--in qualities that demand an appreciative response from informed and discriminating observers. The judges who awarded Wilbur a prize recognized in him superb qualities--qualities that made him a pig to be appreciated rather than a pig to be consumed.

Third, we may regard an object (as Charlotte did Wilbur) with love or affection. Charlotte's love for Wilbur included feelings of altruism, as we would expect, since anyone who loves a living object (we might include biological systems and communities) will take an interest in its well-being or welfare. Love might also attach to objects that exemplify ideals, aspirations, and commitments that "lift up" one's life by presenting goals that go beyond one's own welfare. We might speak of "love of country" in this context. Objects of our love and affection have a moral good, and, if they are living, a good of their own.

Aesthetic value depends on qualities that make an object admirable of its kind; when these qualities change, the aesthetic value of the object may change with them. With love, it is different. Shakespeare wrote that love alters not where it alteration finds, and even if this is not strictly true, love still tolerates better than aesthetic appreciation changes that may occur in its object.

Although love is other-regarding in that it promotes the well-being of its object, it does not require actions to be entirely altruistic. Only saints are completely selfless, and it is hardly obvious that we should try to be like them.[3] Nevertheless, anyone's life can stand some dollop of idealistic or altruistic behavior, as Charlotte says.

When we regard an object with appreciation or with love, we say it has intrinsic value, by which we mean that we value the object itself rather than just the benefits it confers on us. This essay concerns the intrinsic value of nature in its relation to environmental policy. The two forms of intrinsic value-- aesthetic and moral--differ in important ways, as one would expect, since moral

value arises in the context of action, while aesthetic value has to do with perception. I shall touch on these differences, but I do not have space to explicate them here. Those of us who wish to protect estuaries, forests, species, and other aspects of nature may give any of three kinds of arguments--instrumental, aesthetic, or moral--to support our conviction. We might argue on instrumental grounds, for example, that we should save species for their possible medicinal applications, or rain forests because they add to global oxygen budgets. An aesthetic argument, in contrast, would point to the magnificent qualities a ten-thousand-year-old forest or estuary may possess. In nature we find perhaps for the last time in history objects commensurate with our capacity to wonder.

Amoral argument describes obligations we have toward objects of nature insofar as we regard them with reverence, affection, and respect. Such an argument may contend that humanity confronts a great responsibility in learning to share the world with other species. Love of or respect for the natural world increases our stature as moral beings, and it may teach us to be critical of and to change our preferences and desires. By taking an interest in the welfare of some creature beside herself, Charlotte too found there is more to life than "all this trapping and eating flies."

Within the next decade or two, we shall decide the fate of many estuaries, forests, species, and other wonderful aspects of the natural world. How can we justify efforts to protect them? Will instrumental or prudential arguments do the trick? If not, how will we justify the sacrifices we must make to save our evolutionary and ecological heritage?

Why Save the Whales? Consider, as a real-world example, whales. Two centuries ago, whale oil fetched a high price because people used it in lamps. Whales had instrumental value. Electric lights are better and cheaper than oil lamps; accordingly, there is little or no market for whale oil today.

Why, then, do so many people care about saving whales? Is it for instrumental reasons? Are they concerned about maintaining a strategic reserve of blubber? Do they worry that the seas might fill up with krill? No; as whales have lost their instrumental value, their aesthetic and moral worth has become all the more evident.

Whale oil has substitutes in a way that whales do not. We get along easily without whale oil because electricity lights our lamps. The extinction of whales, in contrast, represents an aesthetic and moral loss--something like the destruction of a great painting or the death of a friend. Life goes on, of course, but we mourn such a loss and, if we caused it, we should feel guilty or ashamed of it. No one cares about the supply of whale oil, but we do care about the abundance of whales. Aesthetic and moral value attaches to those animals themselves rather than to any function they serve or benefit they confer on us. When they perish, all that was valuable about them will perish with them.

Fungibility as the Mark of the Instrumental. Insofar as we care about an object for instrumental reasons, we would accept a substitute--for example, ball point pens in place of quills--if it performs the same function at a lower cost. The market price of any object should in theory not exceed that of the cheapest substitute.

With intrinsic value, it is different. When we see, for example, a Jacques Cousteau film about the ability of humpback whales to communicate with each other over hundreds of miles, we are properly moved to admire this impressive species. That we can fax junk mail faster and farther is irrelevant. We admire the ability of these whales to do what they do. It is this species we admire; its qualities demand admiration and attention.

Similarly, love is not transferable but attaches to the individuals one happens to love. At one time, people had children, in part, because they needed them as farm hands. Today, we think the relation between parents and children should be primarily moral rather than instrumental. One can purchase the services of farmhands and even of sexual partners, but our relationship to hired labor or sex is nothing like our relationship to children or spouses. We would not think of trading a child, for example, for a good tractor.

Technology, though still in its infancy, promises to do for many aspects of nature what it has done for whales and for children, namely, to make us economically less dependent on them. This need not concern us. That we no longer require whales for oil or children for tending bobbins does not imply that we cease to value them. The less we depend on nature economically, the more we may find that the reasons to value species, forests, estuaries, and other aspects of nature are not instrumental but aesthetic and moral.

Why Protect the Natural Environment? We undertake many environmental programs primarily to protect the well-being of nature, even if we defend them as necessary to promote the welfare of human beings. Why, for example, did the Environmental Protection Agency ban DDT in the 1970s? The pesticide killed pelicans and other wildlife; that was the reason to prohibit its use. EPA banned it, however, as a human carcinogen--which it is not.[4] Today we should make no such pretense.[5] The new Clean Air Act undertakes an expensive program to control acid rain. The law does not pretend that acid rain causes cancer. It answers directly to moral and aesthetic concerns about what coal-burning power plants are doing to trees and fish.

We environmentalists often appeal to instrumental arguments for instrumental reasons, i.e., not because we believe them, but because we think that they work. I submit, however, that advances in technology will continue to undermine these arguments. The new biotechnologies, for example, seem poised to replace nature as the source of many cultural commodities. As one environmentalist observes: "In the years to come, an increasing number of agricultural activities are going to be taken indoors and enclosed in vats and caldrons, sealed off from the outside world."[6]

When machinery replaced child labor in mills and mines, people did not stop raising children. Society found it possible to treat children as objects of love rather than as factors of production. As biotechnology industrializes agriculture, we may protect farmland for its aesthetic and symbolic value rather than for its products. We may measure wealth not in terms of what we can consume but in terms of what we can do without--what we treasure for its own sake.

Poverty is one of today's greatest environmental and ecological problems. This is because people who do not share in the wealth technology creates must live off nature; in their need to exploit the natural commons, they may destroy it. Analogously, in an urban context, poor people have had to send their children to work in sweat shops--to survive. The problem, of course, is not that poor people have the wrong values. Extreme and deplorable inequalities in the distribution of wealth lead to the mistreatment of children and to the destruction of the environment.

Accordingly, I question the adequacy of the argument environmentalists often make that we must protect nature to provide for the welfare of human beings. I think it is also true that we must provide for the welfare of human beings if we are to protect the natural environment.

Zuckerman's Dilemma

Zuckerman faced a dilemma. He had to choose whether to butcher Wilbur (the slaughterhouse would have paid for the pig) or on moral and aesthetic grounds to spare his life.

What reasons have we to preserve biodiversity, protect rain forests, and maintain the quality of lakes, rivers, and estuaries? I should like to suggest that we confront Zuckerman's dilemma with respect to many of the most wonderful aspects of nature. As we come to depend on nature less and less for instrumental reasons, we may recognize more and more the intrinsic reasons for preserving it.

Water Pollution. Consider, as an example, the problem of water pollution. The question I wish to ask here is whether instrumental arguments would justify the expenditure of the roughly $200 billion Americans invested between 1970 and 1984 in controlling water pollution.[7] Did this investment pay off in terms of our health, safety, or welfare? Could we conclude that, in this instance, instrumental as well as intrinsic values justify the protection of the environment?

I think it fair to say that the large public investment in water pollution control cannot be justified on instrumental grounds alone. The same money put into public clinics, education, or antismoking campaigns might have led to greater improvements in public safety and health. This is true in part because the major uses of water--commercial, industrial, agricultural, and municipal--are not very sensitive to water quality. Drinking water can be treated very cheaply and thus can tolerate many common pollutants. "Much of what has been said about the need for high quality water supplies," two experts write, "is more a product of emotion than logic... [A] plant at Dusseldorf, Germany, withdraws water from the Rhine River, which is of far lower quality than the Delaware, the Hudson, or the Missouri, treats it... and produces quite potable drinking water."[8]

The Value of an Estuary. In the Chesapeake Bay, as in other prominent aquatic ecosystems, pollution must concern us deeply for moral and aesthetic reasons. It is not clear, however, that the harm pollution does to nature translates into damage to human health, safety, or welfare. Indeed, more pollution might be better from a strictly instrumental point of view.

The reason is that the major uses of the Bay are fairly insensitive to water quality. The Chesapeake possesses instrumental value as a liquid highway (Baltimore is a major port), as a sewer (tributaries drain several major cities), and as a site for a huge naval base (Norfolk). These uses affect but are not greatly affected by water quality or, for that matter, by the biological health, integrity, richness, or diversity of the Chesapeake ecosystem.

How does pollution affect the health of commercial and recreational fisheries in estuaries? Consider rockfish (striped bass). Environmentalists for many years deplored the pollution of the Hudson off Manhattan; they pronounced that portion of the estuary--one of the most degraded in the world-- biologically dead. Developers of the Westway Project, who wished to fill the offshore waters to build condos, hired scientists who confirmed that rockfish did not and probably could not visit the polluted lower Hudson.

Environmentalists were able to stop the project, however, by arguing in the nick of time that even though the "interpier" area may be the most polluted ecosystem in the world, it functions as perhaps the most important, healthy, and thriving hatchery for rockfish on the Atlantic coast. The well-being of fish populations--at least as we view it--can have more to do with politics than with pollution.[9]

In the Chesapeake, rockfish populations rebounded after a moratorium on fishing. One might surmise, then, that while fisheries have been hurt by overharvesting, the effects of pollution are harder to prove. Bluefish, crabs, and other "scavengers" abound in polluted waters, including the Chesapeake. And organic pollutants, primarily compounds of nitrogen and phosphorus, could support oysters and other filter feeders if their populations (depleted by overfishing and natural disease) returned to the Bay.

Maryland's former director of tidal fisheries, recognizing the benefits of genetic engineering, argued that the Chesapeake Bay "should be run more like a farm than a wilderness."[10] He believed that the state should subsidize efforts to fabricate fish the way Frank Perdue manufactures chickens. Many experts agree that industrial mariculture, by pushing fish populations far beyond the carrying capacity of ecosystems, will render capture fisheries obsolete.[11]

Pollution at present levels hardly bothers boaters, which is why there are so many "stinkpots" out there. Even in a "sick" estuary, a 347 Evinrude outboard gives people what they apparently want: plenty of noise and plenty of wake. Many recreational fish remain plentiful, and biotechnologists are engineering others to withstand pollutants to which they now succumb. They have perfected a nonmigrating rockfish that need not transit the anoxic stem of the Bay. (They have also perfected an acid-tolerant trout that does well in acidified lakes.) It may not be efficient to regulate pollution to accommodate species. It may be cheaper to regulate species to accommodate pollution.

Since a nasty jellyfish occurring naturally in the Bay makes swimming too painful, recreational interest in the Chesapeake is limited in any case. Most vacationers experience the Bay from bridges, where they sit in terrific traffic jams on their way to resorts on the Atlantic shore. They seem willing to pay a lot to visit the Ho Jos, discos, go gos, peep shows, and condos that stretch from Atlantic City to Virginia Beach. If you are looking for recreational benefits people are willing to pay for, look for them there.

Why Not Pollute? We may find acts of environmental destruction to be aesthetically and morally outrageous even if they do no damage to human health, safety, or welfare. News reports tell us that Prince William Sound, now "sparkling with sea life and renewed health," has produced a record salmon catch a little more than a year after the tragic Valdez spill.[12] From a strictly instrumental point of view, that spill was not nearly so detrimental as many environmentalists thought. The immediate victims, more than 36,000 waterfowl, at least 1,016 sea otters, and 144 bald eagles, have no commercial value. Populations of wildlife will be detrimentally affected probably forever. Theses animals have enormous aesthetic and moral--but little instrumental--worth.

I do not mean to suggest that water pollution, especially when it is illegal or careless, is anything but morally and aesthetically outrageous. I do not mean to minimize the harm it does. I am arguing only that pollution may represent a failure in aesthetic appreciation and moral responsibility without representing a market failure, that is, without impairing any of the uses we make of an estuary. The Chesapeake will perform its major economic tasks: to function as a sewer, a liquid highway, and a place for boating. If it were only the beneficial use rather than the intrinsic value of the Bay that concerned us, controlling pollution further might not be worth the cost.

The Problem of Scale

"What's wrong with this argument," a reader might object, "is that it leaves out the question of scale. We can get away with polluting an estuary here and there if elsewhere healthy ecosystems support the global processes essential to life. At a local scale, an instrumental calculus may argue forindustrializing a particular environment. The problem, though, is that when we apply the same calculus to every ecosystem, we end up by destroying the crucial services nature provides."

This argument has weight with respect to activities that affect the atmosphere. Scientists have shown a connection between the use of CFCs and changes in stratospheric ozone. Likewise, the

excessive combustion of coal and oil threatens to change the world's climate. That we should follow policies that prudence recommends, I have no doubt. The Montreal Protocol concerning CFCs represents an important first step. Prudence also recommends that we reach similar international agreements to decrease the amount of fuel we burn and, perhaps, to increase our reliance on those forms of energy that do not involve combustion.

While it is urgent that we limit atmospheric pollution, this does not give us a reason to protect intrinsically valuable species or ecosystems. The pollution, degradation, and exploitation of the Chesapeake Bay, for example, has no cognizable effect on global biochemical processes. One may argue, indeed, that the more eutrophic the Bay becomes, the more carbon it will store, thus helping to counter the "greenhouse" effect. By solving the problems of the Chesapeake, we do little to solve the problems of the atmosphere. The two sets of problems arise from different causes, involve different sorts of values, and require different solutions.

Rain Forests. Consider the rain forests, which seem doomed by economic progress. One can argue persuasively that humanity has no more important ethical or aesthetic task than to keep these magnificent ecosystems from being turned into particle boards and disposable diapers. Popular arguments to the effect that rain forests store net carbon or add to global oxygen budgets, however, may not be convincing.

Since rain forests are climax ecosystems, they absorb through the cold burning of decay as much oxygen as they release through respiration; thus the popular belief that these forests add to global oxygen budgets betrays a naivete about how climax ecosystems work.[13] One way to get a rain forest to store net carbon may be to chop it down and plant instead of trees fast-growing crops genetically designed to do very nicely in the relevant soil and climatic conditions. (The biologist Dan Janzen has described this dreadful possibility.)[14] The trees could be used to make disposable diapers which, after use, would go to landfills where they would store carbon nearly forever.

Biodiversity. Anyone with any moral or aesthetic sense must agree that another of humanity's greatest responsibilities today is to arrest shameful and horrendous rates of extinction. Yet one is hard pressed to find credible instrumental arguments for protecting endangered species in their habitats. The reason that we produce Thanksgiving turkeys by the millions while letting the black-footed boobie become extinct is that one bird has instrumental value while the other has not. The boobie had no ecological function; it was epiphenomenal even in its own habitat. Its demise in no way contributed, for example, to the loss of stratospheric ozone or to the "greenhouse" effect.

Environmentalists, to justify their efforts to protect biological diversity, sometimes speculate that exotic species might prove useful for medical purposes, for instance. No public health professional, as far as I know, has vouched for this proposition. Pharmaceutical companies are not known for contributing to the Nature Conservancy or for otherwise encouraging efforts to preserve biodiversity. They are interested in learning from folk medicine, but they cannot even think of tracking down, capturing, and analyzing the contents of millions of species (many of them unidentified) each of which may contain thousands of compounds.

If pharmaceutical companies wanted to mine exotic species, they would not preserve them in their habitats. They might trap and freeze them or sequence their genes for later reconstruction. Seed companies would likewise store germ tissue in banks, not leave it in the wild. Capturing and freezing specimens, not preserving habitats, would be the way to go, to make biodiversity benefit us.

Even a single endangered species enlists our respect and admiration, since (as one observer has said) it would require another heaven and earth to produce such a being. The grand diversity of life, particularly the existence of rare and exotic species, presents a profound moral obligation for civilization, which is to share the earth peaceably with other species. This obligation exists whether or not we can defend the preservation of species on grounds of self-interest rather than morality. The destruction of biodiversity may be immoral, even sinful, without being irrational or imprudent.

A Plea for Environmental Ethics

In an old movie, a character played by W. C. Fields, having, it appears, negligently killed a baby, confronts its hysterical mother. Eyeing her youthful figure, he says: "No matter, madam; I would be happy to get you with another."

What we find chilling in this scene is Fields's appeal wholly to instrumental value. He sees nothing wrong with killing a baby as long has he can "get" its mother with another child who, one day, will be equally capable of supporting her in her old age. To Fields, objects have only instrumental value; we can evaluate all our actions in terms of costs and benefits. They have no other meaning.

Moral Value--a Benefit or Cost? The scene in the movie might remind us of the way the EXXON Corporation dealt with public outrage over the recent unpleasantness in Prince William Sound. The corporation assured everyone that the salmon fishery would bounce back. If anyone was out of pocket, EXXON would lavishly compensate them. EXXON said to the outraged public: "No matter, madam; we will be happy to make you at least as well off."

From the point of view of instrumental value alone, both Fields and EXXON were correct. They could replace whatever was lost with equally beneficial or useful substitutes. Another baby could grow up to plow land or tend bobbins as well as the first. The mother's income in old age would not decrease. EXXON too would make up lost income. Isn't it irrational, then, for people to complain when children are killed or wildlife is destroyed? From the point of view of instrumental value, they aren't worth much. They may have meaning, but they confer few benefits on us. They make demands on us. They are mostly costs.

Indeed, raising children, preserving nature, cherishing art, and practicing the virtues of civil life are all costs--the costs of being the people we are. Why do we pay these costs? We can answer only that these costs are benefits; these actions justify themselves; these virtues are their own reward.

I wonder, therefore, whether we environmentalists do well to argue for environmental protection primarily on instrumental rather than on moral and aesthetic grounds. Are the possible medicinal or agricultural uses of rare and endangered species really what we care about? We might as well argue that we should protect whales for the sake of their oil or sea otters to harvest their teeth. I think the destruction and extinction of wildlife would horrify us even if we knew sea otter, murres, and eagles would never benefit us. How do we differ from Charlotte, then, who saved Wilbur even though he did nothing for her?

Preference versus Judgment. "The distinction between instrumental and intrinsic value," someone may object, "lies beside the point of environmental policy, since a cost-benefit analysis, based in willingness-to-pay estimates, can take both sorts of preferences into account. Whether people are willing to pay to protect wildlife for moral, aesthetic, or self-interested reasons (hunting,

for example) is their business; all the policy maker needs to know is what their preferences are and how much they are willing to pay to satisfy them."

This objection misses the crucial importance of the way we choose to make decisions. Consider, for example, how we determine whether a person is innocent or guilty of a crime. We might do this by sending questionnaires to a random sample of citizens to check off whether they prefer a guilty or innocent verdict and, perhaps, how much they are willing to pay for each. This method of reaching a verdict would be "rational" in the sense that it aggregates "given" preferences (data) to mathematical principles laid down in advance. The method is also "neutral" in that it translates a data set into a social choice without itself entering, influencing, or affecting the outcome.

On the other hand, we may trust the finding of innocence or guilt to a jury who are steeped in the evidence, who hear the arguments, and then, by deliberation, reach a collective judgment. This procedure, since it involves discussion and even persuasion, would not proceed from "given" preferences according to rules laid down in advance. The process or method itself is supposed to affect the result.

Which model would be most appropriate for environmental policy? Consider erosion. Public officials must assess instrumental reasons for protecting soil: they must determine how much arable land we need for crops, how much we are losing, and how best to conserve what we have. They also weigh intrinsic values, for example, what soil and its protection expresses about us or means to us as a community. Our policy, presumably, should be based not on the revealed or expressed preferences of a random sample of people, no matter how rigorous our techniques of sampling and aggregating may be, but on the judgment of responsible authorities after appropriate public consideration and debate.

Similarly, policies for civil rights, education, the arts, child labor, and the environment depend on judgment--often moral and aesthetic judgment--concerning facts about the world and about ourselves, that is, about our goals and intentions as a community. People who believe we ought to save the whales, for example, do not tell us simply what they prefer; rather, they call for the reasoned agreement or disagreement of others. That is why public policy is always argued in public terms--in terms of what we ought to do, not what I happen to want.

With respect to aesthetic experience, anyone can tell you what he or she likes, but not everyone can tell you what is worth appreciating. A person judges aesthetically not for himself or herself only but on the basis of reasons, arguments, or ideas that he or she believes would lead others to the same conclusion. Knowledge, experience, sensitivity, discernment--these distinguish judgments of taste from expressions of preference.

To be sure, we enjoy objects we appreciate, but we do not value these objects because we enjoy them. Rather, we enjoy them because we find them valuable or, more precisely, enjoyment is one way of perceiving their value. To enjoy ecological communities aesthetically or to value them morally is to find directly in them or in their qualities the reasons that justify their protection. This is not a matter of personal preference. It is a matter of judgment and perception, which one might believe correct or mistaken, and thus argue for or against, within an open political process.

The contrast I have drawn between instrumental and intrinsic value borrows a great deal, of course, from Kant, who summed up the distinction as follows. "That which is related to general human inclination and needs has a market price . . . But that which constitutes . . . an end in itself does not have a mere relative worth, i.e., a price, but an intrinsic worth, i.e., a dignity."[15] Kant believed that dignity attaches to objects because of what they are and, therefore, how we judge them. The discovery of what things are--whether it is their moral, aesthetic, or scientific properties-

-has to do with knowledge. Like any form of knowledge it is inter-subjective: it represents not the preference of individuals but the will, the perception, or the considered opinion of a community.

Are Values Relative? While many Americans may share an environmental ideology--the United States has been described as Nature's Nation[16]--this does not apply everywhere. Even if the love of nature belongs to most cultures, moreover, it might express itself in different ways. The Japanese may not experience whales as we do; *Moby Dick* is one of our classics. Italians, who treasure their artistic heritage, might as soon eat as listen to a song bird. How can we expect other cultures to respond to nature in the ways we do?

This kind of question may lead environmentalists to suppose that instrumental arguments for protecting nature have a universality that intrinsic arguments do not. Yet instrumental arguments depend on interpretations of fact--models of climate change, for example--that invite all kinds of disagreement. And ethical issues arise, moreover, even when instrumental concerns are paramount, such as when determining how much industrialized and developing nations should cut back combustion to counter global warming. It may be easier to persuade, attract, or cajole other nations to cooperate (if not agree) with our moral and aesthetic concerns than with our reading of prudence or self-interest. The process of reaching agreement is the same, however, whether instrumental or intrinsic values are at stake

Living with Nature. I have argued that we ought to preserve nature for its sake and not simply our benefit. How far, however, should we go? The Chesapeake Bay commends itself to us for intrinsic but also for instrumental reasons. How can we balance our need to use with our desire to protect this ecosystem?

We confront this kind of question, I believe, also in relation to people whom we love and whose freedom and spontaneity we respect but with whom we have to live. Children are examples. We could treat our children--as we might treat nature--completely as means to our own ends. We would then simply use them to take out the empties, perform sexual favors, tend bobbins, or whatever it is that benefits us. This would be despicable as well as criminal. We know that morality requires that we treat our children as ends in themselves and not merely as means to our own ends.

At the same time, we have to live with our kids, and this allows us to make certain demands on them, like not to wake us up too early in the morning, no matter how much we love them for their own sake. While we insist on protecting our children's innate character, independence, and integrity, we have to socialize the little devils or they will destroy us and themselves. I think this is true of nature: we can respect the integrity of ecosystems even if we change them in ways that allow us all to share the same planet.

No clear rules determine how far one should go in disciplining one's children or in modifying their behavior; socialization may have fairly broad limits. But there are limits; we recognize child abuse when we see it. Have we such a conception of the abuse of nature? I think we need one. At least we should regard as signs of environmental abuse the typical results of egregious assaults on ecosystems, such as eutrophication, pandemic extinctions, and so on. We might then limit changes we make in nature by keeping this notion of ecological health-- or disease--in mind.

Zuckerman's Response

William Reilly, administrator of the Environmental Protection Agency, recently wrote: "Natural ecosystems . . . have intrinsic values independent of human use that are worthy of protection." He cited an advisory scientific report that urged the agency to attach as much importance to intrinsic ecological values as to risks to human health and welfare. Mr. Reilly added:

> Whether it is Long Island Sound or Puget Sound, San Francisco Bay or the Chesapeake, the Gulf of Mexico or the Arctic tundra, it is time to get serious about protecting what we love. Clearly we do love our great water bodies: . . . They are part of our heritage, part of our consciousness. Let us vow not to let their glory pass from this good Earth.[17]

In 1991 the State of Maryland offered anyone registering an automobile the option of paying $20 (which would go to an environmental fund) to receive a special license plate bearing the motto: "Treasure the Chesapeake." A surprising number of registrants bought the plate. How many of us would have ponied up the $20 for a plate that read: "Use the Chesapeake Efficiently" or "The Chesapeake: It Satisfies Your Revealed and Expressed Preferences"?

To treasure the Chesapeake is to see that it has a good of its own--and therefore a "health" or "integrity"--that we should protect even when to do so does not benefit us. "Why did you do all this for me?" Wilbur asked. "I've never done anything for you." Even when nature does not do anything for us--one might think, for example, of the eagles and otters destroyed in Prince William Sound--we owe it protection for moral and aesthetic reasons. Otherwise our civilization and our lives will amount to little more than the satisfaction of private preferences: what Charlotte described as "all this trapping and eating flies."

In this essay, I have proposed that we may lift up our lives a little by seeing nature as Charlotte did, not just as an assortment of resources to be managed and consumed, but also as a setting for collective moral and aesthetic judgment. I have also suggested that our evolutionary heritage--the diversity of species, the miracle of life--confronts us with the choice Zuckerman had to make: whether to butcher nature for the market or to protect it as an object of moral attention and aesthetic appreciation.

If Zuckerman had not learned to appreciate Wilbur for his own sake, he would have converted the pig to bacon and chops. Likewise, if we do not value nature for ethical and aesthetic reasons, then we might well pollute and degrade it for instrumental ones. If a spider could treat a pig as a friend, however, then we should be able to treat a forest, an estuary, or any other living system in the same way.

References

1. E. B. White, Charlotte's Web (New York: Harper & Row, 1952).

2. In defining the instrumental and aesthetic good, I follow the analysis of Georg Henrik von Wright, The Varieties of Goodness (London: Routledge & Kegan Paul, 1963), pp. 19-40. Von Wright, however, uses the term technical good where I use the term aesthetic good.

3. See Susan Wolf, "Moral Saints," Journal of Philosophy 79 (1982): 419-39.

4. During the early 1970s an enormous investment in research led to completely inconclusive findings based on animal studies, although one prominent pharmacologist summed up the available evidence by saying that at then-current levels DDT was not a human carcinogen. For documentation, see Thomas R. Dunlap, DDT: Scientists, Citizens, and Public Policy (Princeton: Princeton University Press,1981), esp. pp. 214-17. Oddly, there have been few epidemiological studies during the 1980s, but those that were ~one show no clear link between DDT exposure and cancer risk. For a review with citations, see Harold M. Schmeck, Jr., "Study Finds No Link Between Cancer Risk and DDT Exposure," New York Times, 14 February 1989, reporting a decade-long study of nearly 1,000 people with higher than average exposure to DDT; it found no statistically significant link between the amount of DDT in their bodies and the risk of death by cancer.

5. Scholars argue correctly, I believe, that "in the 1970s, the prevention of cancer risks was accepted as a proxy for all environmental damage." A. Dan Tarlock, "Earth and Other Ethics: The Institutional Issues," Tennessee Law Review 56, no. 1 (1988): 63 (citing the DDT controversy as an example). See also, Regulating Pesticides, National Academy of Sciences (Washington, D.C.: NAS Press, National Research Council,1980), pp. 18-28.

6. Jeremy Rifkin, Biosphere Politics: A New Consciousness for a New Century (New York: Crown, 1991), p. 69.

7. Office of Policy Analysis, EPA, The Cost of Clean Air and Water, Executive Summary (1984), p. 3. For an overview of the disappointing results of water quality protection, see William Pedersen, "Turning the Tide on Water Quality," Ecology Law Quarterly 15 (1988): 69-73.

8. A. Kneese and B. Bower, Managing Water Quality: Economics, Technology, Institutions (Baltimore: John Hopkins Press, Resources for the Future, 1968), p.125.

9. For details about the Westway Project, see The Westway Project: A Study of Failure of Federal/State Relations, Sixty-Sixth Report by the Committee on Government Operations, 98th Cong. 2d Sess., HR 98-1166, Washington, D.C., U.S.G.P.0.,1984. See also Action for a Rational Transit v. West Side Highway Project, 536 F. Supp.1225 (S.D.N.Y.1982); Sierra Club v. U.S. Army Corps of Engineers, 541 F.Supp. 1327 (S.D.N.Y 1982) and 701 F.2d 1011 (2d Cir.1983). For another case history exemplifying the same point farther up the Hudson, see L. W. Barnhouse et al., "Population Biology in the Courtroom: The Hudson River Controversy," BioScience 34, no.1 (1984): 14-19.

10. George Krantz is quoted in the Washington Post, 26 September 1984.

11. See, for example, Harold Webber, "Aquabusiness," in Biotechnology and the Marine Sciences, ed. R. Colwell, A. Sinskey, and E. Pariser (New York: Wiley, 1984), pp. 115-16. Webber believes we depend on traditional fisheries only because the "results of recent research and development in the biotechnological sciences have not yet been integrated into the broader context of large scale, vertically integrated, high technology, centrally controlled, aquabusiness food production systems." He calls the substitution of industrial for "natural" methods of fish production in aquatic environments "Vertically Integrated Aquaculture (VIA)."

12. Jay Mathews, "In Alaska, Oil Spill Has Lost Its Sheen," Washington Post, 9 February 1991.

13. For discussion, see T. C. Whitmore, "The Conservation of Tropical Rain Forests," in Conservation Biology: An Evolutionary Perspective, ed. M. Soule and B. A. Wilcox (Sunderland, Mass.: Sinauer,1980), p. 313: "The suggestion, sometimes made, that atmospheric oxygen levels would be lowered by the removal of tropical rain forests rests on a mistaken view of climax ecosystems."

14. See William Allen, "Penn Prof Views Biotechnology as Potential Threat to Tropical Forests," Genetic Engineering News 7, no.10 (1987): 10. The article quotes a letter by Janzen: "Tropical wildlands and most of the earth's contemporary species still exist because humanity has not had organisms capable of converting all tropical land surfaces to profitable agriculture and animal husbandry. Within one to three decades, organisms modified through genetic engineering will be capable of making agriculture or animal husbandry, or both, profitable on virtually any land surface. Agricultural inviability, the single greatest tropical conservation force, will be gone."

Some commentators have speculated that transpiration from rain forests may play some role in the atmosphere. Since more that 85 percent of water absorbed into the atmosphere comes from the oceans, however, the marginal difference--if any--in transpiration between natural and biotech species in rain forests is unlikely to be consequential.

15. Immanuel Kant, Foundations of the Metaphysics of Morals, ed. R. P. Wolff, trans. L. W. Beck (Indianapolis: Bobbs-Merrill, 1959), p. 53. Emphasis in original.

16. Perry Miller, Nature's Nation (Cambridge, Mass.: Harvard University Press, 1967).

17. William K. Reilly, "A Strategy to Save the Great Water Bodies," EPA Journal 16, no. 6 (1990): 4.