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THE AGE OF ECOLOGY

Lister Sinclair
Good evening. I'm Lister Sinclair and this is IDEAS on The Age of Ecology. Twenty years ago, at the time of the first Earth Day, environmentalism stood at the margins of public discussion. Its tone was apocalyptic, its proposals radical. Prophetic voices denounced the myth of unending economic growth. Today, everyone in his right mind is an environmentalist. Margaret Thatcher worries about ozone depletion, the World Bank offers environmental services and the nuclear industry proclaims without a blush that, for them, every day is Earth Day. But as the ground shifts and formerly radical ideas harden into new certainties, new questions arise as well and new distinctions need to be drawn. Is environmentalism's radical challenge to our way of life being trivialized and co-opted? Have we actually grasped the problem we're so enthusiastically determined to fix?

Tonight, we begin a new eight-part series by David Cayley which raises questions rather than answering them. We'll present conversations with thinkers who question the nostrums of environmentalism as well as the prescriptions of economics, and we'll invite perplexity, and not just alarm, as we stand at the threshold of the Age of Ecology. David Cayley.

David Cayley
I began to notice a new tone in public discussion in the summer of 1988. There was drought that summer, and in the middle of it, Toronto played host to a big international conference on global warming. The possibility that industrialization might eventually lead to a catastrophic greenhouse effect has been recognized by some scientists for nearly a hundred years, but now evidence was being offered that this process was actually under way. The evidence is still disputed, but it is at least plausible, and even the possibility of human impact on the vast scale of the earth's atmosphere seems to transform public discussion. Within a year, a rhetoric which put even human survival in doubt was commonplace. David Suzuki presented a special series of programs on CBC Radio called "It's a Matter of Survival." I began to worry, too, but not just about the threat to the planet. I also began to wonder about the unexamined assumptions in this new way of speaking and thinking. To take just one example, the icon of this new mood, the sign of its piety as well as its panic, was the image of the earth photographed from space, the earth according to NASA, you might say. Suddenly, this miniature blue earth was everywhere. Differences and distances were obliterated. It was just us and our endangered planet, and everyone seemed to understand that we had to save it. Few seemed to notice the ambiguity of this image, the trivialization involved in shrinking the world to the dimensions of a logo and then using it like one. The fact that this was not just a new object of popular piety but also the banner of a new class of "ecocrats" who spoke openly about "managing planet Earth." The image seems sweet, seductively beautiful, vulnerable, but it also conveys the imperious gaze of technocratic science, the determination to command nature that has brought the earth to the edge of catastrophe in the first place. Having thought myself for twenty years an environmentalist, I now found myself on the sidelines, muttering, like Eliot's J. Alfred Prufrock, "That's not what I meant at all. That's not it at all." The rhetoric of survival suggested only what my friend Stuart Hill calls "humanity in retreat"--not a vision of a flourishing human community but of people grimly clinging to their branch by their fingernails. The new vogue for green consumerism seemed to throw the thornier question of what should be produced into the shadows. As environmentalism joined the mainstream, it seemed to be losing its ability to imagine a different society and to be asking only how to preserve, defend, sustain the existing way of life.

At the time I began to wonder about some of these things, I had the good fortune to meet a German thinker by the name of Wolfgang Sachs. He, too, was critical of the direction mainstream environmentalism was taking and his writings helped me to understand what bothered me about the new environmentalist discourse I was hearing all around me. Sachs grew up in the German Green movement of the seventies. He worked on alternative energy policies for Germany as part of the research group on energy and society at the Technical University of Berlin. He wrote a book on the life of the automobile, now being translated into English, and then, in the early eighties, edited a journal called Development published in Rome. At the time we met, he was working with Ivan Illich and teaching for part of the year at Penn State University. I spoke with Sachs at State College, Pennsylvania in the fall of 1989.

Wolfgang Sachs
Today, you see, what bothers me is that too many people too easily talk about "the environment." What once had begun as a call for new public virtues is now about to be turned into a call for a new set of managerial strategies. If one sees how the World Bank begins to move into environment, if one sees how the experts of yesterday, the industrialists of yesterday, the planners of yesterday, without much hesitation, move into the field of environment and declare themselves as the caretaker of the world's environment, the suspicion grows that the experts of these institutions now have found a new arena, a new arena to prove their own indispensability, and all of that in the name of ecology and the survival of the planet. And what bothers me most is--I mean, development has been an intervention or many interventions into the life of many countries in order to boost the GNP. Now, with the alarm that the survival of the planet is in danger, we slowly move into a situation where there is no limit to intervention any more, because can you imagine any better justification for huge, for large scale interventions in people's lives than the survival of the planet. Now, for me that means I have to step back and to ask myself, ah, what is happening here, to ask myself what are the new distinctions we have got to make.

David Cayley
As Sachs began to draw these distinctions, he noticed that

environmentalism had always contained contradictory impulses, that these contradictions, in a sense, constituted the science of ecology.

Wolfgang Sachs
The very term "ecology" implies already an ambivalence. Ecology can be a demonstration on the street and it can be a computer modelling. Ecology can be political action as much as it is a strict and sober academic science. On the one hand, we have a movement which attempts to put science, rationality into its place, if you want to limit science and rationality and technological dominance, a movement which I would submit in its deepest motives has an anti-modernist gesture to it. On the other hand, we have here a movement which claims to call for the better science, namely it takes reference to ecology, which is an established science, and criticizes today's rationality and science in the name of ecology. So it takes resort to a science in order to push anti-modern aspirations. Now, this hybrid character of ecology, however, I would say is the secret for its success. Let's say the secret epistemologically speaking, the secret for the success of the ecology movement all over the world is exactly this ambivalence, this hybrid character of ecology, because it combines both. It combines a call for science, which is the religion of modern society, with a call for less science and rationality, which is its anti-modern heritage. So it combines modernism and anti-modernism and, if you want, it is the first anti-modernist conservative movement which attempts to fight its enemy with its own means.

David Cayley
So long as environmentalism remained an opposition movement, the contradictions contained in the word "ecology" provided the movement with a sort of hybrid vigour. It could straddle both sides of the issue and get away with it. But now that environmentalism has advanced at least to the vestibules of power and influence, this contradiction is increasingly exposed. For Sachs, this means that the very different meanings of environmentalism now have to be distinguished and two very different political options set against each other.

Wolfgang Sachs
Take the problem of fuel consumption in the automobile and the pollution caused by the automobile. Now, there are two basically different ways, two distinct ways to deal with that. The one is, you say well, the automobiles, how we use them today, nothing can be done about it. This has become our second nature. So then what you are left to do is you will try to increase the efficiency of those automobiles. You will build them in a way that they would run more kilometers with the same gallon, and, in a way, the technological development goes that way, and we are going to have fuel efficient cars and fuel efficient engines. Now, the second way would be to ask yourself what do you want from an automobile and how many automobiles do you want. You would try to put a brake on overall numbers of automobiles, and in particular the performance of automobiles. You would begin to talk about a low speed car because speed is the single most important factor for energy consumption and the pollution effects. You would, for instance, try to speak about or to construct, to invent, if you want, an automobile which, let's say, because of its construction cannot run faster than 50 miles an hour and an automobile which then has its point of highest internal efficiency at, let's say, 15 miles an hour, 20 miles an hour. Now, when you do that, all of your parameters for the construction of automobiles have changed. You need much less sophisticated technology. You don't have so many problems with weight any more, you don't have to have all the safety precautions which are built into these automobiles, you have less consumption of land for streets, you have a lower number of mortal accidents, you have lower energy consumption, you have lower pollution output. So what I am saying here is, I'm saying that I would like to reconsider our use of automobiles and what we expect from automobiles, and I would like to call for, if you want, a slower society. I would like to call not for the wholesale abolition of the automobile, but for a more intelligent automobile, for a more moderate motorization. That's a different approach. It's an approach which asks what do we want, what do we aspire to, what do we want to work for, how do we want to live, whereas the other approach asks, well, on the way we live we cannot change anything, so all that we can do is to try to make more out of less, to make it more efficient, to manage it better, to streamline it. And in effect, what the second approach or the management approach, where it is going to is a more streamlined, a more monitored, a more well tuned society in the name of ecology.

David Cayley
This new society preaches what Sachs calls "the gospel of global efficiency." Instead of choosing freedom through self-limitation, it is choosing high consumption under ecological surveillance. The movement which Sachs hoped would reduce the grip of constant economic calculation on our lives now threatens to increase it.

Wolfgang Sachs
Take, for instance, one word which has made a tremendous career, that's the word "risk." Today, everybody talks about risk and risk management and risk precaution. It gives life to quite a number of new departments in governments and also universities. Now, what has happened here? I was always struck by that difference. I remember very well that in the '70s when it came to nuclear power and chemical plants, we talked about dangers. We talked about dangers, about threats, at most about hazards. Now look at the language, what is happening. If you have a child which every day goes to school, and on the way to school there's a pit, there's the danger that the child falls into the pit. So what do you do? You would remove the danger by putting a fence around the pit or putting a board over it. Now the moment you say there is the risk for the child to fall into the pit, something happens, a new attitude. You are not going out to prevent the danger but you are going there and you think, well, you see, maybe I shouldn't put the board over it because the board costs me so-and-so much. It may be the risk that the child falls in there is not that high. You begin

to calculate, to weigh one factor against the other. So the more we talk about "risks" and not about "dangers" or "threats" to our lives, the more we pull the dangers into the language which is the language of weighing costs and benefits, of calculating, of weighing one cost against the other, the more we imply management, monitoring, risk control, continuous supervision. So something happens here in the language, and again, in the language, you can follow this slow trend towards environmental managerialism.

David Cayley
One of the reasons Sachs fears this new managerialism is that he sees it as a homogenizing force: the astronaut's gaze perceives no boundaries, only the flowing forces of planetary ecology.

Wolfgang Sachs
It is as if, under the eyes of planetary management, it is as if there are no differences, as if there were no differences any more on the globe. Nations fade away, interests recede into the background, cultures are used only in an ornamental way any more. There is no "other" camp on this world. The world somehow merges into one unity. I mean, in a sense, for a long time one has called, since the Enlightenment, for a unity of humankind, but this was a moral postulate. We would strive to overcome war and violence and people should strive to unify mankind under the governance of reason. But now what is happening is the unity of the planet, in effect, is the result of fear. It's the result of a menace, a threat, the result of the threat of the final catastrophe, and this menace, this threat, in a way, in our perception creates a homogeneous global space where other differences, differences between cultures, between men and women, between nations, between top and bottom, don't matter any more.

David Cayley
To verify what Sachs says, you have only to turn on your television. You'll soon hear a lament about what "we" are doing to our environment. But this "we," for Sachs, is a depoliticized and depoliticizing category, a night in which all cows are black, as Hegel says. It omits distinctions of class, country or social system and reduces everything to a biological, dead level.

Wolfgang Sachs
I remember very well that in the '70s we fought, against nuclear power plants, against new highways, as citizens who wanted to have a different life, as citizens who had a different notion of what the good life is about. Today, I notice that the citizen doesn't exist any more. When you look into a Newsweek report, you don't find the citizen there, you find the human species there. So human beings are not called citizens in the most recent environmentalist discourse, but they are called species, and the problem they are facing is not what we used to call quality of life, let's say, but the problem they are facing is survival. You don't have societies or communities any more, you have populations instead. So I see that a language like "species" or "viable populations" is advancing, and I do think that this language brings along a biological reductionism, a biological reductionism which again has the function to make disappear many things which make us human, namely that we have different aspirations, that we have different notions of the good life. These differences again fade away with that kind of biological language, and I see that, for instance, as another sign that under the banner of ecology we are moving into a new phase of making the world more uniform.

David Cayley
The elimination of citizens is also implicitly the elimination of a civic space in which citizens can act. Biological language, in effect, drives out political language.

Wolfgang Sachs
I think it is a grand operation to render politics irrelevant. Because imagine only, which is about to happen, that let's say the World Bank or international institutions adopt that language. Talking about species, survival, populations is a kind of talk which does not give room for a political discourse any more and it doesn't give room for a moral discourse either. You are not asking any more how do you want to live, how can we responsibly live, what do we want to produce, how do we want to do it, how do we want to arrange our lives, what are our aspirations in life. No. In a certain way, everything gets levelled to a biological discourse, and I think that what is happening, that all kinds of political distinctions will evaporate and also the moral argument remains without a grip. That of course is an old dream of technocracy. An old dream of technocracy is to make political arguments, political distinctions disappear until you reduce everything to does it work, to the functional requirements, and the best basis of functional requirements of course is a biological basis because, in the end, it is somewhat convincing that at the end we want to survive. So once you are able to reduce a global problematic to a biological problematic of species survival, there is no political or cultural argument which can somehow disturb the actions of technocracy any more.

David Cayley
Sachs obviously doesn't depreciate survival as such. Rather he fears it as a political motive, and he is astounded at the irony that the wealthiest societies in history can find no worthier reason for being.

Wolfgang Sachs
I think there has never been in history a society for which survival would have been a prominent objective. To secure survival was a banality, something which went along with whatever greater achievements a society wanted to aspire to. Now, we have the paradoxical situation today, that in the very moment where we have amassed riches like never in our history, experts from all four corners call upon us and call upon our governments to put survival first. Now, I ask myself what is happening here. I do think it is important to recognize that the call for survival assumes that in the future we will always be moving along the edge of the abyss.

Traditional societies, societies in history, knew limits to their production and consumption. In various ways, they stayed away from the edge of the abyss. Now, we through industrialization and the recent upsurge in industrial production have been pushing the limits. We have been pushing the limits so far that now water and soil and air have become scarce goods, as they say, and we have pushed the limits so far that we are moving along the edge of the abyss. Now, in that situation, to call for gearing society towards securing survival implies that we are unable and incapable to step back from the edge of the abyss. It implies that we have to set up institutions, to find experts and to transform governments into steering a precarious course along the edge of the abyss. Therefore my mistrust against calls for securing survival, because they are putting survival first. But I do want a society where life is in the first place and not survival, and putting life, which means for me the various calls and images for the good life in the first place, means to step back a little bit, to step back from the edge of the abyss in order to be again in the position not to have to put survival first as the governing principle of social politics.

David Cayley
Survival, to Sachs, is code for carrying on a commodity-intensive way of life under the surveillance of ecocrats. The alternative is what Ivan Illich once called "conviviality," a more austere life, lived primarily in an interpersonal dimension and based on culturally defined limits to production and consumption. Both approaches agree on the need to do something about pressing problems, like excessive carbon dioxide emissions, but they disagree on how and even more on why to do it.

Wolfgang Sachs
It seems obvious that when it comes to our emissions of CO2, we have gone overboard. So what common sense also demands is, as much as possible to bring down our CO2 emissions. However, the kind of colour which the discussion takes on is that we have to fund lots of research in order to understand better all the atmospheric feedback, the feedback cycles in the atmosphere, to understand better the earth and atmosphere system, to understand better meteorology, the formation of clouds, the impact of oceans, and so forth. And to understand better means to check out how responsive nature will behave. The hidden intention is to go to the limit, to see how far can we ride the tiger. The more you know about the responsiveness of nature, the more somehow you can test the limits. For instance, what is happening in Germany is that the minister of research has put on a program for doing research into the possible effects of rising sea level on Germany and the German coasts. So they are already spending money for making a greenhouse related event manageable. They take for granted that we cannot bring down much our level of greenhouse emissions. Now, what I wanted to say basically is, I agree, of course, like many do, and I agree also with environmental managers or ecocrats on that, that we have to bring down our greenhouse gases. I do however think that we have to do that from a position of ignorance. We have to say two things: first, we are not able to understand all the complex mechanisms which govern the atmosphere of the planet, and second, we have to behave prudently. That means we have to keep back far away from the edge of the abyss, and that, in conclusion, means we have to bring radically down our emissions of CO2, in particular through transformations, restructuring our way of life, our way of producing.

David Cayley
To get to your preferred approach of limitation, of stopping short well before you come to the abyss so you don't have to then manage your careering along the edge of it forever, it implies that there's a political society which can make these decisions. And I'm wondering finally if that political society any longer exists.

Wolfgang Sachs
I don't know. I can only have the hope, but I don't have the expectation. However, I would submit that in that sense history is on my side, because just if you look back in the last fifteen years what has happened in the world, all kinds of surprising things happened. Think of Poland, think of the Soviet Union. History consists of surprises. So for that reason, I do not know what will happen. Neither do I know what the best strategy could be to make something happen. I think history is not something where strategies are being played out. Now, that means for me that even if I am fully aware that today's political situation is not very inviting when it comes to defining, appreciating limits to growth, I personally try to do something you could call--I don't know--selective simplicity. Not to do some things which everybody is supposed to do, not to have a television or not to have a car, to decouple from what is considered an average consumer today. That's already a step in the right direction. Then, of course, as an intellectual or as somebody who tries to be politically active, I try to advance ideas, to advance a language, to advance a perspective which makes more visible a politics of self-limitation. I do not know if that will be effective. I only would like to be there when history comes around with some new surprises.

David Cayley
Wolfgang Sachs questions the implications of replacing the traditional language of politics with the language of biological science, of transforming citizens into species, nations into populations, the bounded spaces of earth into the swirling systems of planetary ecology and survival into a reason of state. His scepticism about ecology as a political guide echoes the earlier work of historian Donald Worster, the author of Nature's Economy: A History of Ecological Ideas, published in 1977. Worster, now at the University of Kansas, began his research at the end of the '60s when the Age of Ecology was first heralded. It was then that ecology achieved the unique status of a science that was, at the same time, the banner of a popular movement. There were no physics parties or sociology parties, but there were ecology parties springing up all over the Western world. People entirely innocent of the academic science of ecology began to call themselves "ecologists." "Is ecology a phase of science," asked

the distinguished ecologist Paul Sears in an essay he published in 1964, "or is it an instrument for the long-run welfare of mankind?" Donald Worster wondered at such claims. "Like a stranger who has just blown into town," he wrote, "ecology seems a presence without a past." He decided to investigate.

Donald Worster
What struck me forcibly about twenty years ago was that there was a new science on the horizon, at least on the popular scene, the science of ecology. News magazines were talking a great deal about ecology, ecologists were appearing on the covers of news magazines. This new science was making quite an impression. It was being hailed by many people as a new oracle. It was the authority finally needed, the guide to get us out of the environmental crisis. It would furnish Truth, here with a capital "T". Others were beginning to argue that it provided a basis for a radically new world view, a new ethic, even a new religion. I remember how many people were coining new words with "eco" attached, from ecology, attached as a kind of prefix. Eco-philosophy, eco-feminism, eco-cities, that sort of thing. Well, I set about to examine the history of ecology, I suppose to sort of find out what its employment record had been, to get some sense of its CV, if you like. I was interested in the way in which science has shaped our perception of nature, over time, in order to understand where it would take us in the future if we depended on it as an oracle.

David Cayley
What struck Worster was what he called the moral ambivalence of ecology, its contradictory character. He called the two contradictory tendencies the arcadian and the imperialist. The imperialist side could be traced back to Francis Bacon and his vision of science as the subjugation of nature, "the effecting of all things possible," in Bacon's resonant phrase. The arcadian tendency was embodied in the Romantic movement, in Goethe's vision of an ethical science or Henry David Thoreau's wonderful description of his scientific studies as "nature looking into nature." He also noticed the metaphorical character of ecology, the way in which it reflected the attitudes of the surrounding society. Both ecology as metaphor and ecology as moral ambivalence were clearly displayed in the work of the 19th century's greatest ecologist, Charles Darwin.

Donald Worster
Charles Darwin is the clearest example I think we have of how a scientist working with reason, facts, hypothesis nonetheless reflects the society and the culture of which he is a part. On the one side, Darwin put at the very core of his science the idea of a struggle for survival in the natural world, a fiercely competitive world that clearly reflected the 19th century English society in which he was living, the society of laissez-faire capitalism, industrialization, growing poverty, urban social problems. He was aware of those things and they affected the way in which he saw the natural world. When he looked at the natural world, he could not help but see the kind of social forces going on in Victorian England. On the other hand, Darwin maintained a kind of vision of order and harmony in the natural world, the beauty of the whole, and I think he took that mainly from the romantic poets, artists, naturalists and philosophers of the early 19th century who formed a kind of counter movement to that industrial revolution, laissez-faire capitalism. So Darwin was a man whose most interesting insights came from this contradiction, the way in which they worked together, those two tendencies in his thought, worked together to create the foundations of, really, modern ecology. And so subsequent scientists can take both sides from Darwin and they can study ecological adaptations, the harmony of the natural world, or they can emphasize competitive exclusion, struggle for survival, the law of tooth and fang, individualism, and the subsequent history of ecology is really a debate that goes on and on between those two poles of thought. Is nature essentially a co-operative, balanced whole or is it a world of chaos, struggle, bloodshed, murder?

David Cayley
The ambivalence of ecology has taken many forms. One of these forms has been the debate between a mechanistic approach, which has been characteristic of science since its origins, and an organicist and vitalist approach, which looks for some living principle in the natural world.

Donald Worster
That contradiction goes back well before Darwin, into the 17th and 18th centuries. Scientists mixed their metaphors a good deal then. Is nature a living whole, an organism? Is there a kind of breathing soul and spirit of the natural world that in effect makes all of nature a single organism? There were those in the 17th century who were arguing yes. At the same time, people were developing a quite contradictory model of the natural world, a metaphor of the machine, that nature is essentially a kind of contrived mechanism, springs, bolts, levers working, wheels turning, all of that sort of thing. But again, the philosophical implications in those two almost diametrically opposed world views are not well worked out, I think, until the later part of the 19th century. They sort of lie there together, as they probably do still in popular literature and thinking or even in a lot of scientific thought. But by the late 19th century, there is clearly a debate, a very conscious debate going on about those two sets of metaphors and the world views that they're a part of, the organismic and the mechanistic, and ecology is very much wrapped up in that.

David Cayley
In the early part of the 20th century, the organicist approach clearly held the upper hand. Its leading exponent was the American ecologist, Frederic Clements.

Donald Worster
Clements was a Nebraskan, an ecologist at the University of Nebraska, who founded the first North American school of ecology, often called the Climax School. Clements' argument about nature was essentially that it goes through a series of

stages, or what he called the succession, that leads finally to a climax stage, a kind of fully mature, settled stage in which the plants and animals are all in fairly perfect balance and they endure, they're stable. At that point, nature has in effect evolved into a kind of single organism. He described the prairies of North America as a single organism that was so closely integrated and so harmonious in its workings that it looked like a kind of organism, perhaps not as complicated or as closely integrated as a buffalo or prong-horned antelope, but still had organismic qualities to it, and those organismic qualities in effect allowed it to continue, to give it a life of its own, to give it permanence.

David Cayley
Clements' theory has endured in the popular mind, but as science it began to be superceded in the 1940s. Ecology veered back hard towards a more reductive or mechanistic and more easily quantified approach, and a new synthesis emerged.

Donald Worster
It seems to me that ecology by the '60s had dropped Clements and was now basing its ideas of the natural order on physics and on systems theory, and the word that replaces "climax" is "ecosystem." It's a word coined by an English scientist, Arthur Tansley, in the 1930s, but it doesn't really catch on in this country until after World War II. The ecosystem includes both plants and animals, but also the inorganic parts of the environment which Clements basically left out--the soils, the geochemical cycles in the environment, to get a model of nature that is essentially based on the flow of energy from the sun, through the plants, on up through the animals, recycling itself constantly, the matter constantly recycling, energy being passed up the food chain and finally lost through the processes of entropy into the black hole of the universe. This theory is mainly associated with Eugene Odum at the, University of Georgia, whose textbook, The Fundamentals of Ecology, was the dominant one by the early 1970s and remained so, I think, through the 1970s. It's the form of ecology that most of us know. Over the last twenty years, it's been the one that has been in the news most. You talk about ecosystems a great deal, damaging of ecosystems. If you read any news reports on the oil spill in Alaska recently, they all talk about the ecosystem and what oil is doing to damage the ecosystem. That's all out of the new ecology of the 1950s, '60s and '70s.

David Cayley
What's notable about the metaphorical expression of the new ecology?

Donald Worster
Well, it's a combination of many, many ideas and metaphors again, some of them derived from physics and energy flow, but what's most interesting to me about it is the economics language that it now embeds deeply into the textbooks. Odum uses this to describe his ecosystem, and most everyone else who's followed the ecosystem model talks also in economics language. They see the ecosystem as being divided into producers and consumers, and what is flowing through this ecosystem is the currency of energy. So nature has become very explicitly an economy and one that looks a great deal to me like a modern industrial consumer society, with producers and consumers all organized, circulating the commodities of the shopping malls. It's a kind of a well run factory that nature manages for maximum productivity. They begin to use words like productivity. Economic efficiency is applied, only they call it ecological efficiency. The production of biomass is the standard by which the ecosystem is measured. How much biomass does an ecosystem produce? So in effect, into the middle of all this physics and language of energy etc., systems theory, we've got grafted on a kind of economics of nature.

David Cayley
At the time that Donald Worster published Nature's Economy, he could still describe the ecology of the ecosystem as "the new ecology." It remains the prevalent popular understanding. But when Worster went back to the ecology textbooks recently to bring his history up to date, he found that, as science, it too had been superceded.

Donald Worster
The ecosystem as an idea has dropped out of the index of many of these modern ecology textbooks. What they're seeing is not a pattern of order, what they're seeing is chaos, and in fact there are some ecologists today who are very much a part of the new science of chaos. When they look at nature, what they see is instability, disorder, a shifting world of upheaval and change that has no direction to it. Clements' nature had a direction, the climax theory. That was the end point. In effect, the ecosystem had an end point, it had a direction that nature was evolving toward. But in the most recent ecology, I don't see any direction. There's a loss of confidence in any concept of order. What ecologists are finding when they look at an acre of land is constant change going back thousands and thousands of years. Some of this is coming from paleo-botany, the study of ancient pollen sediments in ponds and bogs. But what they see as they go back and look at the history of any particular place is just constant change. Ecologists have become historians and what they're finding is very little in the way of any coherent model that's sort of been there all along. If you look at the Great Plains of North America as an example and you go back a few million years, we go through forest, we go through seas, we go through grasslands. When does it end? What's the pattern here? Clements was aware of this, Eugene Odum's certainly aware of this, Darwin was aware of it. These people all invented, in a sense, the fact that nature has a past, a history. We've all been historians of nature for a long, long time, but it's become far more I think pronounced as a tendency in recent times, with the outcome that there is less and less confidence that there is any coherence to any of this. It's just shifting patterns. Plants come and go, animals come and go, the climate changes regularly, nothing is predictable, the future won't be anything like the present, and so on.

David Cayley
Donald Worster began his research in the history of ecology in order to assess the claims being made for it as a potential guide. He found a kaleidoscope of images and ideas drawn from current social practice, a persistent moral ambivalence and a wavering and uncertain image of nature--just about what you'd expect a believing historian to find, but hardly a basis for moral decisions.

Donald Worster
Right now, if you're a policy maker and you call up an ecologist who's been reading some of the new textbooks and you ask the question, Well, what does your ecology tell us to do? What do you want us not to do? And the answers are very troubled, uncertain. If the world around us is as chaotic as some of the recent textbooks say and so full of change and upheaval, what can ecology tell us to do or refrain from doing? What does it mean to damage nature? How do we even know we're destroying nature if nature has such a troubled history? It puts the policy maker in a very difficult position if he or she is turning to science as the authority, the oracle, today. In the 18th century there was no question that there was an order designed by God. Darwin had no question in his mind that finally evolution led to order and harmony, and he knew it when he saw it. Clements had no question about that, that there was a climax state of vegetation that the white man had disrupted and destroyed, creating the dustbowl in the 1930s. Eugene Odum had no question that there was something called an ecosystem that could be disrupted or unbalanced, damaged in some fashion or other. All those preceding concepts of order I think have fallen away. A new one may be on the horizon at any time, but right now I don't see one, as an historian looking at what's been going on in ecology for the last several years. So we're reduced to talking about nature in clearly anthropocentric terms. That is, the damage we're doing is not to nature but to ourselves, or it undermines the sustainability of our economy or our society, or it threatens human health in some fashion or other. But that's about all we have in the way of basis for policy. Maybe that's enough, maybe that's all we'll ever have, but it's rather different, I think, from what people thought we were heading toward twenty years ago, around the time of the first Earth Day.

David Cayley
The failure of ecology as an oracle leaves responsibility right where it always was, in any case, with the society that invented science in the first place. Science can show us no definitive image of nature on which to base our judgements. But for Worster, that doesn't mean that we should abandon science or moral judgement, just notice the difference.

Donald Worster
My view is that we shouldn't throw science out. It is clearly, however, shifting ground. To build a world view or an ethic or religion, if you like, on the science of ecology is like building a house on a floodplain. Sooner or later, a lot of water's going to come down that stream and wash you away. I think historians are inevitably sceptical and relativistic when they think about science as an oracle. It seems less reliable when we look at its past, and that's I think one of the outcomes of my own research into the history of science. But I remain committed to the idea of an order of nature, I remain committed to the idea that we don't simply talk about the damage we're doing to this planet in anthropocentric terms, and it seems to me that we have to get our heads together from all disciplines, ways of thinking, to discover what that order is. We need artists involved, we need poets, we need historians, we need philosophers. We need reason. Scientists are going to be a part of that but they're not going to give us the final answers, the decisive answers that will solve all our policy questions and provide us a basis for morality and ethics.

Lister Sinclair
The Age of Ecology continues tomorrow night on IDEAS. Heard on tonight's program were Donald Worster of the University of Kansas and Wolfgang Sachs, now at the Institute for Advanced Studies in Essen, West Germany. The series is written and presented by David Cayley.

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Lister Sinclair
Good evening. I'm Lister Sinclair and this is IDEAS on The Age of Ecology. In the late 1940s, shortly before his death, the American conservationist, Aldo Leopold, published an essay called "The Land Ethic." In this essay, he raised disturbing questions about the utilitarian, human-centred approach to conservation in which he himself had participated as the author of an influential text on game management. "One basic weakness in a conservation system based wholly on economic motives," Leopold wrote, "is that most members of the land community have no economic value. When one of these is threatened, and if we happen to love it, we invent subterfuges to give it economic importance." To get out of this bind, Leopold proposed that society be centred on something greater than the human interest, what he called "the land community," of which humanity was to be no more than a plain citizen. Leopold's essay raised questions which are more pertinent than ever today, in the midst of widespread panic about the environment. Is the earth ours to manage? Do humans actually have the capacity to manage it, in any event? Is an environmental movement which adopts the utilitarian language of economics trying to drive out the devil with the devil? Tonight, in the second hour of The Age of Ecology, you'll meet two people who have tried to put forward these troublesome questions: naturalist John Livingstone and biologist David Ehrenfeld. The Age of Ecology is written and presented by David Cayley.

David Cayley
In the early 1970s, a powerful environmental movement began to take shape in North America. By the end of that decade, it was evident that this movement was far from

homogeneous. One of the points of division was the problem Leopold had posed in the '40s: the proper role of human beings in the larger community of life. The problem was implicit in the very word this movement popularized as the sign of its concerns, the word "environment." "Environment," according to my dictionary, means "the aggregate of external circumstances. Unlike "nature" or "world," it's a purely relational term, conferring value on something only in relation to something else. Environment is always implicitly "our" environment. Philosophers like Norway's Arne Naess began to distinguish what he called "deep ecology," which sees intrinsic value in nature, from a reformist perspective, which argued only in terms of the environment's instrumental value for human beings. One of the books which introduced this more searching, more philosphical spirit into the North American environmental movement was David Ehrenfeld's The Arrogance of Humanism. Ehrenfeld is a professor of biology at Rutgers University in New Jersey, the editor of a journal called Conservation Biology and a well known writer. We spoke in his office at Rutgers about the mood in which he conceived The Arrogance of Humanism.

David Ehrenfeld
What originally made me write The Arrogance of Humanism was a paper that I had written for American Scientist called, if I remember correctly, "The Conservation of Non-Resources," and in that, I examined the problem of what do we do about the 90 or 95 per cent of animals and plants in the world that don't have any value to human beings that's obvious. Do we pretend that they have a value, do we concoct values, do we search and see if we can find values or do we develop other reasons for conserving things that don't seem to have any value and may in fact never have one? That paper was very successful and it got a lot of attention. And I was talking about it with my wife Joan, who is a plant ecologist, one day and she said, well why don't you turn it into a book. And that's exactly what I did. I developed the book around the paper.

David Cayley
David, what approximately did you and do you mean by "humanism"?

David Ehrenfeld
Well, the way I use the word "humanism" in the book, it's one of these "motherhood" words, you know. I mean, it has so many meanings and some of them are things that you can't possibly argue against or dislike. The definition I used is about the second or third definition you'd find in the dictionary, which is making a religion or the religion of humanity. It's the belief that human control knows no bounds, no limits, that ultimately we are the be-all and end-all on this planet and we should therefore have faith in our own abilities to arrange things as we see fit. That's the humanism that I was referring to.

David Cayley
Can you give an example or examples of what you mean?

David Ehrenfeld
Well, an old example is the Aswan dam. The Aswan dam was built to solve a particular problem, which is that they needed power for industrialization, and of course there were political problems too because the Russians were building it for the Egyptians and there were political reasons why it had to be built. But they were told before it was built that it was going to cause all kinds of health problems for them because the irrigation canals would have snails which would spread schistosomiasis all over--which is a terrible disease--all over Egypt, and a number of Harvard medical school parasitologists were told to leave Egypt when they said this. Some very distinguished parasitologists were essentially kicked out when they warned about it. The dam stopped the flooding of the Nile basin so all the spreading of nutrients brought down by the river over the soil, which was a free spreading of nutrients during the flood season, stopped. The dam is silting up, as dams always do, so that all of that nutrient which was at one point useful when the river was spreading it itself is now just junk, sitting at the bottom of the reservoir and making the reservoir shallow. It cut off the flow of fresh water to the eastern end of the Mediterranean, which made the Mediterranean more salty, and yet it reduced the nutrients at the same time, which made the algal growth less common, so the sardine fishery died. And one can go on and on. The dam was an unmitigated disaster for Egypt.

David Cayley
The Aswan dam is a classic case of unwanted side effects, foreseeable to some extent but ignored in the pursuit of the main chance and eventually overwhelming the intended benefits. There are dams just like it all over the world, dams with silted up reservoirs, dams whose turbines are choked with water hyacinths, dams which drove whole peoples from their homelands and broke their spirits. The history of foreign aid is full of such projects. But Ehrenfeld's point is not restricted just to megaprojects like dams. He thinks the models of biologists are just as likely to go awry as the models of engineers. One example, and it's one eastern Canadian fishing communities are likely to be sensitive to at the moment, is the concept of maximum sustainable yield and fisheries biology.

David Ehrenfeld
If you start fishing in a fishery, at the beginning, at least when the fishery is first fished, you actually can get more out of it as you fish more, and that may be--well, it's probably for a variety of reasons but one of the reasons, for example, is that you're catching the older fish which are hogging a lot of the resources but not growing very fast and therefore leaving resources, food, for the younger fish which are growing quite quickly. So you can actually increase the yield of fish caught just by fishing a fishery, up to a certain point, and that point, theoretically at least, is the maximum sustained yield, and you can in theory continue fishing at that level for ever and always catch that level of fish. This is the theory. It was nicely exploded about ten years ago by I think a Canadian fisheries biologist by the name of Phillip Larkin. What Larkin did in a paper called "An Epitaph for the Concept of

Maximum Sustained Yield" was point out that the idea treats a fishery, a species of fish, let's say mackerel or herring, as the only thing in the sea. But of course there are many species of fish and other kinds of animals and plants upon which the fish ultimately depend, all of which are interacting, and this interaction, this complexity makes it impossible to deal with a fishery as if it were composed of just one species. So in fact when you manage one species, another one that's valuable may go down, or things that are happening with the second fishery may effect your plans for the first one. It really kind of gets out of hand. And I in my book pointed out that this was very reminiscent of something that John von Neumann and Oskar Morgenstern, a great nuclear physicist and mathematician, and economist respectively, had pointed out in their book on the economic theory of games, namely that in a closed system, you can't maximize more than one variable at a time. It's just not possible to do. And so there are limits and this is one of the limits, and I think we should be suspect whenever we hear that our activities in the environment are working out just fine when they involve a great deal of control, because very often they don't.

David Cayley
David Ehrenfeld's fundamental point in The Arrogance of Humanism, as I'm sure you've gathered, is that "the best laid schemes o' mice an' men gang aft a-gley." His approach in this sense seems to resemble Ivan Illich's. Illich has identified a phenomenon he calls "paradoxical counterproductivity," whereby institutions, once they cross a certain threshold of size and intensity, begin to frustrate and subvert the very purposes for which they were established in the first place. Education stupefies, medicine sickens, the machine turns on its creator. Ehrenfeld sees similar inherent limits to successful human intervention in the environment, and feeling this way, he's sceptical of the current rah-rah, we can turn it around approach to environmental clean-up, feeling that it may not have grasped just how deep the problem goes.

David Ehrenfeld
I don't think there's any doubt that if we do not change our fundamental philosophy and our approach to dealing with this world, that all the recycling, all the clean-up, all the neighbourhood committees, all the river watches, all of this sort of thing in the world will not be enough to make even a dent in the problem. It really will be just a tiny blip on the history of environmental collapse. That sounds very bad. If these remedial kinds of actions, clean-up actions, are accompanied by what I would call some spiritual action, then I think we have a reasonable chance--a reasonable chance. But without it, I just don't see any hope at all.

David Cayley
Setting aside just for the moment the spiritual action necessary, why will these efforts be only a "blip," as you said?

David Ehrenfeld
Because if we are going to say it's going to be life as usual, with the exception that we will try to clean up as we make our little piles of dirt as we go along, that's just hopeless. The problem is of much greater magnitude than that. I can't begin to tell you how trivial then our clean-ups would be. There also has been this rah-rah spirit in conservation, and it has been applied to the saving of species. Well, frankly, although it's important to try to save species in zoos, and some of the more responsible zoos like the Bronx Zoo, and in Chicago the Lincoln Park Zoo, and San Diego Zoo in this country are certainly doing that, and some of the zoos in England and I would imagine Canada too. Nevertheless, it's quite clear that, for example, we can't save more than a trivial percentage of animals in zoos and if we do save them in zoos, what have we got? What is a tiger that has been kept in zoos for three or four generations or six generations, what kind of an animal is it? Is it still a tiger? Is it a large pussy cat? Does it know what to do, genetically, in the wild? Is it capable of coping with Siberian winters or Indian monsoons? We don't know. We're trying to save seeds of endangered plant varieties in places like the National Seed Storage Laboratory in Fort Collins and in places like Kew Gardens in England, and it's a failure. It's an abysmal, stinking failure. We cannot save seeds of even the varieties of things that we have created in this world, for a whole number of reasons. And in fact we often are losing more than we're acquiring, so every time a new variety comes in, on the average, an old one disappears, of corn or wheat or rice or eggplant or whatever we're trying to save. But there are even biological reasons, as well as the political and technological ones, why this kind of saving doesn't work. What has to be done is to protect the farmers in the environments in which they live who are growing these things. In other words, we're really talking about a kind of a problem that technology is utterly incapable of coping with. It's too big for technology and too complicated for technology. We just don't know what to do, how to do it, nor do we have the resources even if we did. So I would say the spirit of Earth Day is wonderful, provided we have a mechanism for translating it into the realization that, as Wendell Berry says, we have to all learn to live a little bit poorer. We have to learn to live without ruining, and that is going to mean that there are things we cannot do any more that we seem to want to do.

David Cayley
Living poorer, for Ehrenfeld, means living on an entirely different scale. Like many ecologists, he sees that environmental destruction has proceeded at all times and in all kinds of social systems. Ancient civilizations wrecked their agriculture, just as modern civilizations are doing. Communism, as we now see from the sick children and sterilized soils of eastern Europe, is worse than capitalism. Ehrenfeld concludes that the large-scale state is itself the problem, however it is organized.

David Ehrenfeld
I don't really think that the social system, at least in the classic socialism versus capitalism lines, makes a heck of a lot of difference. I think that's an outmoded idea. I think that what does make a difference is the degree to which a society

decides it's going to be managerial, and I think that if you set up large-scale centralized management, regardless of the political system, whether it's a democracy or a dictatorship, whether it's pure socialism, pure communism, pure capitalism or some kind of mix, you're going to have the same kind of environmental degradation. And if you set up a system in which your units, your political units and your control units, are small, fairly decentralized and somewhat hands off, you're going to have much less environmental degradation than you do now. So I would see that there's going to be a great shift which we're now seeing the beginnings of--and somebody else will have to write this book because I'm not a political scientist. But the paradigm that we've all been brought up with is communism versus capitalism. Well, that stuff is old hat. You can throw it away, it's not interesting any more. It's not productive and it's not useful. The next paradigm that's important is big versus small, centralized versus decentralized, control verus hands off. This, I think, is the paradigm that the next century is going to have to cope with somehow. How, I'm not sure.

David Cayley
David Ehrenfeld's denunciation of human arrogance, like his call for spiritual action, has deep roots in the Jewish tradition from which he comes. He denies the prevalent view that the biblical religions are the source of human chauvinism towards nature. This view traces back to an influential essay written by historian Lynn White Jr. in 1967 called "The Historical Roots of Our Ecological Crisis." White argued in this essay that Christianity in particular had preached man's destiny to dominate and exploit nature. David Ehrenfeld disagrees.

David Ehrenfeld
Yes, there's the famous two sentences, two verses in Genesis I, verses 26 and 28, in which Adam is told to go out and take dominion over the earth and to subdue it. And that's pretty terrible sounding, isn't it, and that, according to Lynn White, gave a licence to Christians and to Jews, although I think he's less concerned with Jews, gave a licence to Christians to go and destroy. Well, this is all very nice in retrospect, but in fact it was never interpreted, those verses were never inerpreted that way, either by the early Jewish sages or by the Christian church fathers. Nobody interpreted it that way. Let me read to you an extract from Ecclesiastes Rabbah, which is a commentary on the Book of Ecclesiastes which was first redacted in the 8th century. Now, this is 1200 years ago that it was written down and is probably older than that. At any rate, the point is that this was not a time when people were worried about the environmental crisis. So let me read that to you.

"In the hour when the Holy One, blessed be he, created the first man, he took him and let him pass before all of the trees of the Garden of Eden, and said to him, 'See my works, how fine and excellent they are. Now, all that I am going to create for you I have already created. Think about this and do not corrupt and desolate my world. For, if you corrupt it, there will be no one to set it right after you.'"

Now, think of the power and grandeur of this. But these people were writing in the 8th century, the Dark Ages is what we call them, how in accord is that with the thesis of Lynn White that the early Jews and Christians and modern Jews and Christians have taken a licence to destroy from the Bible? Here's another little commentary. This is from the Talmud, the great Jewish commentary on the law, just a little four lines:
"Our masters taught man was created on the eve of the Sabbath, and for what reason? So that in case his heart grew proud, one might say to him, 'Even the gnat was in creation before you were there.'"
I mean, isn't that an extraordinary kind of a statement? You know, in The Arrogance of Humanism, I had very carefully of course considered this article of Lynn White's in the paperback edition, which is still available, much more than in the original hardcover, and so I put two quotes, one to start the book and one to end. And the quote I started the book with was from the Book of Job: "Is it by your wisdom that the hawk soars and spreads his wings towards the south? Is it at your command that the eagle mounts up and makes his nest on high?"--where God is saying to Job, I created this, you didn't. Who do you think you are? And then I ended the book with a brief quotation from Isaiah, and this is a modern Jewish translation, and I think a good translation of the Hebrew: "It was your skill and your science that led you astray and you thought to yourself, I am, and there is none but me." That I think really sums it up, what I'm talking about when I say that we have to recapture some kind of spiritual dimension in our relationship to the world, and a little bit of humility, too.

David Cayley
This raises a question about where our attention should be directed, I think. There's a lot of language about saving the planet, and so on, which it seems to me directs attention outwards. And I wonder if that's good, whether we can deal with this without directing attention inwards, without seeing that it's we who are being corrupted and not just the environment as a sort of a colourless, tasteless, odourless "out there."

David Ehrenfeld
Yes. I'm sitting here with a book at my elbow by Wendell Berry, The Unsettling of America, and I think for many of us, Wendell Berry is the first and the last word on the whole subject of where the world is heading and where it ought to be heading. And Berry has always said that conservation begins at home, that environmentalism begins at home, and this I think is absolutely critical. One has to put one's own internal house in order, and then go to the community, and then if there's any luxury of time or energy left over, then you go on to wider things. I think some people have to have in a sense some of that time and energy left over because there has to be some spreading of this idea around the world and some communication. But first you start at home, and then it has to extend from oneself. You can't be a hermit and be an environmentalist, just as, for instance, you can't

be a hermit and be a practicing Jew. You have to have to have a community.

David Cayley
I'd like you ask you finally about what I'll call environmentalism for want of a better term, meaning all those persons who are concerned with this. And this is a movement which seems divided in many ways but which ranges certainly from a managerial perspective at one end, an attitude which is confident that sustainable development is possible, that you can have growth and environmental protection, however it's phrased, and at the other end one has a biocentric perspective, let's say, descending from Leopold's famous saying that we should be only a "plain citizen" of the biotic community. It seems to me that coming out of your Jewish roots, you take a different view, neither one nor the other.

David Ehrenfeld
Yes, let me try to answer your question by describing the Jewish attitude towards work and the Sabbath, which I think is the ultimate, for me at least, the ultimate way of stating this problem. In Judaism, you're supposed to work six days and rest on the seventh. On the seventh day, on the Sabbath, which for us is Saturday--or it actually starts Friday evening at sundown, you are supposed to stop working and there's three things you have to do if you are going to observe the Sabbath correctly. You can't create anything. I mean anything. If you get an idea for a book, you cannot write it down on a piece of paper. That's very painful for an author and it happens to me all the time, and I wonder, will I remember this till after sundown on Saturday, and sometimes I do and sometimes I don't, and I have stopped worrying about it. If you're a gardener, you can't plant a seed. That's a creative act. You can't do it. You also can't destroy anything. That's the second thing you can't do. Again, if you're a gardener and you see a weed growing in your garden, you can't pull it up, you can't kill an insect pest, you can't shoot a rabbit, or anything of that sort on the Sabbath. The third thing that you're supposed to do is a positive injunction, which is to celebrate the Sabbath and celebrate the fullness of the earth that was given to people to live in, to work in and to enjoy. So you have this prohibition against creating or destroying, which means you cannot be a manager, you can't be a steward even in any sense. You've got to leave it alone, and it will continue all by itself. It's a wonderful lesson. You also have to learn how to enjoy it, and that's the other part of the lesson. People were told you had to have the confidence, in a sense, in the earth and in the creator of the earth that says I'm going to just rest for one day, I'm going to leave it alone. Now, I think that stewardship without the idea of the Sabbath is bound to go wrong. Without the idea of the Sabbath, without some idea of a built-in restraint, then the steward eventually becomes very arrogant. Hence my title, The Arrogance of Humanism. The stewards says I'm really the king. You know, the late J.R. Tolkein, in his book, his wonderful Ring trilogy, The Lord of the Rings, has this dilemma of a steward who says How long do I have to stay a steward if the king doesn't show up? When do I become a king? And the man who asks this question is told by his father, who is the steward, Even ten thousand years wouldn't be enough, and essentially there is never a time when a steward becomes a king. Well, I think that there's a great temptation for stewards to want to play king, to want to play God, and without some kind of a restraint that's built in at a regular basis, a kind of constant reminder you're not running the show, you can't run the show. You don't know enough to run the show and you never will and you're only going to mess it up if you have that attitude. Without that idea, then I think that stewardship is bound to go awry, to go amiss. I think that the idea of the Sabbath, for Jews, and perhaps for Christians too, introduces this idea of restraint which is so essential to keep stewardship on the right track. So I think that stewardship is the only hope, but I think it has to have some kind of restraint built into it.

David Cayley
David, thank you so much.

David Ehrenfeld
You're welcome.

David Cayley
In 1980 a book appeared which I think of as a kind of sibling to The Arrogance of Humanism. It was called The Fallacy of Wildlife Conservation and it was written by John Livingstone, a lifelong naturalist and a professor in the Faculty of Environmental Studies at York Unviersity. It was a book, Livingstone once told me, written in blood--his life's blood. After a lifetime of arguing for wildlife conservation, Livingstone took apart the arguments he himself had made and found them all wanting. Everything seemed to come back to what David Ehrenfeld calls "the doctrine of final causes," the idea that the end to which something can be put is the cause for which it was created, the idea, as Ehrenfeld says, that gravity exists in order to make it easier for us to sit down or that rain forests should be saved because they may contain undiscovered medicines. Species and places with no obvious economic usefulness become recreational amenities, prized for their aesthetic value. All arguments circle back on humanity. None can penetrate what Livingstone calls "the metaphysical dome" which encloses human society and cuts us off from the living world. In the light of The Fallacy of Wildlife Conservation, John Livingstone began, in effect, a second career, searching for a way out of environmentalism's utilitarian bind, trying to put a retractable roof on the metaphysical dome. We spoke recently in his office at York.

John Livingstone
If I have a technique, it has been, I think, to ask the question that my colleague, Reg Lang, always asks: What is the problem to which this is the solution? So what I've done mostly is critical analysis, I think, of the statements of the so-called conservation movement, the so-called environmental movement, and so forth. Nobody seems to want to reveal what the problem is that is being addressed by all the environmental placards. I like to say to my students, "Go out