

EPA JOURNAL

The
Environmentalists

An Interview
with Rene Dubos

Sun Day



Environmental Perspectives

In this issue EPA Journal takes a look at the environmental movement and where its many components stand in the "decade of the environment."

Administrator Douglas M. Costle comments on the key-stone role of public participation in EPA's decision-making process and why the Agency needs to draw upon the creativity of outside groups.

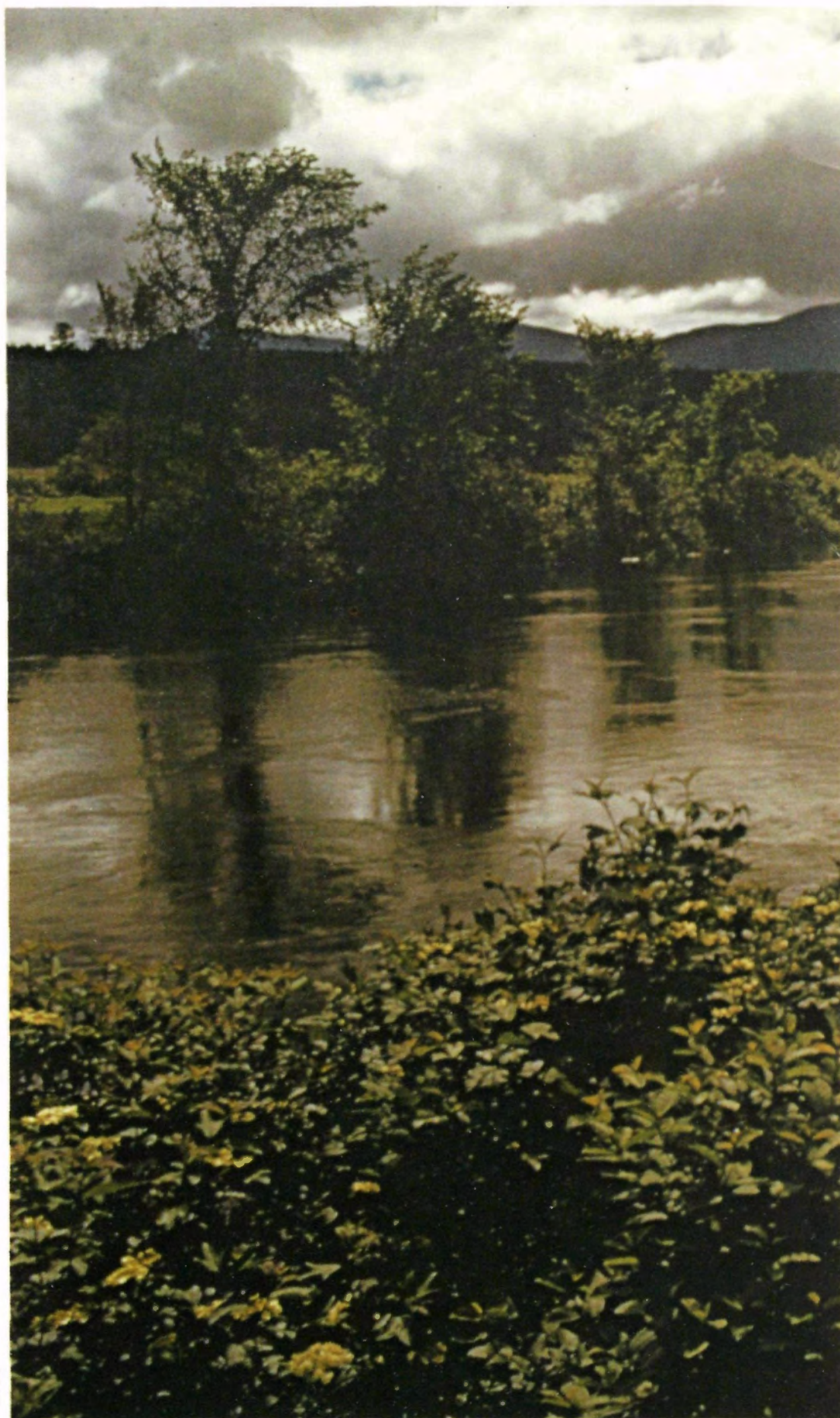
Dr. Rene Dubos, Pulitzer-prize winning author and scientist, discusses both the local and international aspects of the environmental movement, in a wide-ranging interview that touches on such diverse subjects as bans on autos in Manhattan streets and erosion in Greece.

Barbara Blum, EPA Deputy Administrator, takes a look at the ways in which the Nation is turning to before-the-fact resource management and public health protection, rather than after-the-fact attempts at environmental control.

In other articles, Elvis J. Stahr, President of the National Audubon Society, details the important role that conservation organizations play in our society. Thomas L. Kimball, Executive Vice President of the National Wildlife Federation, explores the idea of what future archaeologists may infer about our throw-away civilization in probing our city dumps. Thumb-nail portraits of major environmental groups in the United States are furnished in a round-up story by Terry Fleishman.

Abby Rockefeller, scion of a famous American family, describes in an interview with EPA's John Boykin an alternative to the conventional toilet that has been developed in Sweden.

Other articles deal with environmental education and control of chemical spills. □



EPA JOURNAL

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EPA's Purpose: To formulate and implement actions which lead to a compatible balance between human activities and the ability of natural systems to support and nurture life.

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Sun rising through the mist over the Nitinat River on Vancouver Island, British Columbia.

Opposite:
The Androscoggin River at Berlin, N.H.

Photo credits:
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Text printed on recycled paper.

The EPA Journal is published monthly, with combined issues July-August and November-December, by the U.S. Environmental Protection Agency. Use of funds for printing this periodical has been approved by the Director of

the Office of Management and Budget. Views expressed by authors do not necessarily reflect EPA policy. Contributions and inquiries should be addressed to the Editor (A-107), Waterside Mall, 401 M St., S.W., Washington, D.C. 20460. No permission necessary to reproduce contents except copyrighted photos

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The Need For Public Participation

By Douglas M. Costle, Administrator
United States Environmental Protection Agency

Public participation is a controversial issue, but ironically the debate about it seems to go on mainly in private. Many public officials oppose it, but you're unlikely ever to hear them admit their feelings in public.

I am in the opposite corner. I emphatically support public participation, and I'm doing all I can to make sure it becomes the keystone of the Environmental Protection Agency's approach to decision-making.

I'd like to focus here on two aspects of public participation: first, what are the benefits that EPA and others can expect to realize from it? and second, what are the major obstacles to making it reality? I hope it is clear what I mean by "public participation." Let me first give an example of what I don't mean.

A few years ago a group of citizens brought suit against a major interstate highway project, asserting that the Environmental Impact Statement (EIS) was inadequate. They charged that alternatives hadn't been given enough consideration, that various environmental impacts hadn't been considered very well, and—of course—that they had been shut out of the process of drawing it up. As the trial went on, the State's chief highway engineer eventually came to the stand, and he was asked how the EIS had been prepared. In a burst of candor, he admitted that it more or less came out of his own head.

It is now nearly five years since the suit was brought, and the decision on that multi-million dollar highway project is still up in the air. This story illustrates not only what public participation isn't, but also one of the major reasons why it's a necessity when significant governmental decisions are being made.

The need to avoid costly delays is one good reason to bring the public into the decision-making process, but there are any number of others. To cite just a few, it allows an agency like EPA to draw on the creativity of outside groups and individuals. It protects us from promulgating rules that don't accomplish what they're intended to. And it leads to an improved understanding of what we're trying to do, and why we're trying to do it.

There's another irresistible reason for us to support public participation: President Carter and the Congress have ordered us to do so.

As Administrator, I'm called upon almost daily to make decisions that can have far-reaching impacts—not only on the quality of the physical environment, but also on the economy, on public health, and on the shape of the country's future development. For example, I have had to act on a proposal for dealing with the problem of synthetic organic chemicals in drinking water supplies. For those municipalities where organics are a serious problem, activated charcoal filtration systems are going to be required. These are expensive systems, but the threat to public health posed by organics is a serious matter.

That is just one major action where I'm required to judge how competing values should be weighed to protect the environment. While I certainly don't shrink from the responsibility—it goes with the job—I believe it would be arrogant and irresponsible not to let the people who will be affected by my decision help to shape it.

The business and industrial communities have sometimes been skeptical about the advantages that public participation can offer them. I think this skepticism is misplaced. Business people often have legitimate gripes about environmental programs, and a full public airing can expose these problems to a wide audience. In addition, a public decision-making process defuses the charge that business and industry influence government actions behind closed doors. Finally, a wide open process means participation by what might be called the "rank-and-file" of an industry rather than just by trade associations.

EPA's Office of Public Awareness (formerly the Office of Public Affairs) is making a special effort to stimulate public participation by developing ties with various special publics, or constituencies.



Business and industry constitute one of these groups with a distinct interest in environmental protection, since they are the target of many of our laws and regulations. Labor is another; environment affects the economy, employment, and the health conditions of the workplace and community. Women, responsible for a great share of consumer purchasing in America, have a definite interest in environmental matters, likewise public interest groups, environmental organizations, farm workers and rural dwellers, members of minorities, the urban population, and young people.

We in EPA need to be aware of these publics and how our actions affect them as well as the public in general. And we feel that these special publics should be aware of how environmental laws and programs affect them directly and how they can make their influence felt, what points of access they have to the Agency.

State and local officials have a special stake in full participation. President Carter recognized this last spring when he directed all Federal agencies to find better ways to involve such officials. In the area of environmental protection, the States and regional and municipal bodies are often asked to take a major share of the burden. Congress usually puts up some of the funds to support this work, but as I'm well aware, it's only enough to ease the pain not to make it go away. State and local officials should welcome the chance to let us know early and often how a program is going to affect them.

EPA has some special projects underway to increase the involvement of officials at other levels of government. We are working with the Southern California Association of Governments in a pilot program to keep such officials up to date about actions planned by EPA, and to make it easier for them to register their opinions. We have given funds to organizations representing State, regional, and local governments so they can set up briefings and workshops on the recent Clean Air Act Amendments.

Other groups that clearly have a lot to gain from full participation include academic leaders, consumer representatives, members of the scientific community, and those who have a particular interest in environ-

mental health. Leaders of these groups have already made the case for full public participation quite eloquently. And I have noticed a real effort on their part to listen to the concerns of other segments of society, including those for whom protecting the environment has had a low priority. Our effort to encourage public participation could further that willingness to listen to the opposition. It could help disputants see that they are not as far apart as they thought.

Public participation enables us to receive information and to give information through three kinds of activities, all of them traditional but in need of expansion and cultivation:

First, public hearings, conferences, workshops, and other meetings.

Second, advisory and review groups—often but not always of a scientific and technical nature—to consider proposed actions, to criticize and suggest.

Third, meaningful information mechanisms to help the members of our various publics relate to our mandates. This involves making clear the scientific basis for what we do, the effects on public health, on the economy, on society. What does a program do? Why? What are the benefits? What will it cost?

There are, of course, some serious difficulties in having the public participate in EPA decisions. The most common objection is that it introduces more confusion and delay into a process whose inefficiency is already legendary. This need not happen, however. The system won't always look neat. There will be some shouting, and the rules of etiquette may sometimes fall by the wayside. But this is what public participation is all about, getting divergent opinions out into the open, where they can be integrated into a final decision.

There may be short-term delays. We built a slight new delay into the process when we decided to extend the comment period on all proposed Agency actions to 60 days. The point about such delays, and about any controversies that public participation may involve, is that we can plan for them, we can find ways to mini-

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Think Globally, Act Locally

An Interview with
Dr. Rene Dubos
By Truman Temple

Dr. Dubos, you have written and spoken for many years on the adverse effects of environmental problems on mankind. Historically, has man been able to improve his environment anywhere? I have an optimistic attitude about human intervention into the environment. I was raised about 30 miles north of Paris. This is a country which from the natural point of view was completely covered by forest and marshes until about 4,000 years ago. At that time Neolithic man settled in it and began clearing the land. Since then it has been under heavy agriculture with a very high population density. And yet today, many people think it is one of the most enchanting kinds of European landscapes, much like English East Anglia which also was forest and marshes before the advent of man.

Human beings can intervene into nature and transform it, provided they do it with ecological wisdom. Ecological wisdom in the past was purely empirical. People did certain things without knowing why, but now we have enough knowledge that we can change the landscape without destroying it.

In this country, the Pennsylvania Dutch country is an example of that. It was created only 200 or 300 years ago by the Amish people and others who have maintained an extraordinary quality of land and have made the countryside singularly more interesting than it was before. I could say much the same about some of the New England countryside.

This is the thesis I have defended for four or five years in articles and books. In fact in one book, "The God Within," I express that very strongly but now I am going to defend it in a much more scientific way and docu-

Dr. Dubos is Professor Emeritus at Rockefeller University and the author of many books and articles on environment, biology, and medicine. He has received numerous awards including the Pulitzer Prize for his book, So Human An Animal. Truman Temple is Associate Editor of EPA

Sailboats ply the sparkling waters of Lake Washington near Seattle.

ment it a little better. So that brings me to a fairly elaborate statement that I presented at the University of Colorado in Boulder a year or so ago, which is going to be published. I call it the resilience of ecosystems. I believe that *anywhere* in the world, almost, an ecosystem that has been damaged can be brought back to a good condition if you help nature to function with the natural repair systems that exist. It is easy enough to see on the East Coast where farms have been abandoned only 50 or 60 years ago, that the forest comes back spontaneously. Forty years ago I bought an abandoned farm in the Hudson River Valley and I know what that means.

We understand that you and your wife planted many trees there.

Hundreds of trees, yes. We spend most of our week-ends reforesting and taking care of the trees but also trying to manage to keep open views, to keep the country and that farmland more interesting. Hemlocks do wonderfully well so we have planted a lot of them, and they are now magnificent. This is in Garrison, New York, in the Hudson highlands. It is a countryside where most of the farms were abandoned 100 years ago when it became much easier to go and farm in the Midwest and Far West. But when I speak of the resilience of natural ecosystems, of their ability to recover after all sorts of damage, people say, "Well you are speaking of the East Coast where we have an abundance of good water, rainfall, and where things can recover. But that is not true for the rest of the world."

Now that is what I used to believe until I began to look into it, and to discover that almost *anywhere* in the world on the surface of the Earth, ecosystems can recover. Let me give you a few examples. The Mediterranean lands and Greece in particular, 4,000 years ago were a heavily forested country. Plato in one of his most famous dialogues said that in the old days all of Greece was forested. There were beautiful streams where the temples were erected, whereas now many of those streams have dried up and

those slopes are denuded, and eroded completely. And of course this is absolutely true. But then about three years ago I went through Greece with a very famous planner, Constantinos Doxiadis. He showed me that if you take any one of those islands and just prevent goats and rabbits from browsing, without your doing anything, within ten years you have good-sized trees, and all sorts of other vegetation. In other words, even under these conditions, nature comes back.

Why don't the Greeks stop using goats? There must be an economic reason.

They are beginning to stop. As prosperity comes in, they stop using them.

Goats can feed almost anywhere whereas of course, cows won't. A goat will eat anything, and of course, kills all vegetation. But, right near Athens some people I knew have taken land where their homes are and they fenced it completely. This was not only to keep goats out but also rabbits. And if you walk through that area you see the classical Mt. Hymettus denuded and as described by writers, but there is a whole section of it now which is reforesting itself. So what I am saying is that even under very difficult conditions, nature can recover. The most extraordinary example was discovered by satellite three years ago during the famous drought south of the Sahara in the Sahel country. People observing maps saw a big area more than a quarter million acres that was green in contrast with all the rest that was desert. That was traced to a ranch. This large acreage was fenced and divided into sections in which they have cattle. The cattle graze on one section a year, then move to the next section and there is no browsing by any other animals because it is fenced. And if you do that even during the drought the whole thing is green.

"If you cannot do something about that stream or park or those lovely marshlands in your town, how do you think you are going to save the globe?"

This example of goats being used by low-income farmers brings up another point. Can the poor climb the economic ladder and cope with environmental problems at the same time?

This is one of the great debates. It is not how can the poor improve their lot, because they are made poorer by the devastation of land through the use of goats. It is a matter of how to convince them. It is not only an educational matter but it involves a program using authority. Obviously I am not competent to deal with such political and economic questions. The reason I mention that ranch in the south of the Sahara is that it points to the possibility of using part of the land in rotation so as to permit the rest to recover.

We hear attacks being made on the environmental movement, charging that it serves mainly the affluent and preserves the status quo, such as the much-publicized Storm King Mountain controversy. Do these charges have any validity?

I am interested that you should mention Storm King because our place in Garrison is only a few miles from it. Anyone, rich or poor, who lives in the area where they can look at it or go fishing in the Hudson is against using Storm King for a reservoir, because it would not only change the appearance of a most beautiful piece of scenery but also would decrease enormously the amount of fishing one could do in the river. Because if the water is being pumped when the fish are breeding, many small fish would be destroyed. It is not a nuclear power plant. They would pump up the water during the night, creating a reservoir, and then during the day the water would come down and generate electric power. But that enormous amount of pumping is fantastically destructive to fish life. So you do not have to be a wealthy fisherman to be against it. On the other hand, if you live in the village where the Storm King reservoir is being built, then you would be in favor of having it



Unspoiled marshlands on Sandy Hook less than 15 miles from New York City are part of Gateway National

because this would bring employment while it is being built. It is a very complicated problem.

In your book *So Human An Animal*, you mentioned concern that urban man's senses have been dulled, that he accepts dirty air and noisy streets because he is so adaptable an animal. How do we reverse this?

I mentioned one aspect, how quiet New York City is on special occasions when they ban cars. You know they ban them now and then on Fifth Avenue, and during the weekends in Central Park they completely ban the car all year round.

And you mentioned that New Yorkers actually smile on those streets.

Yes, it is absolutely extraordinary. I had an illustration of this recently. A young woman came to see me who comes from Cleveland. I asked her, "How can you bear living in New York? Isn't it terribly painful to you?"

And she told me, "Well yes, of course." Because she was used to running with her dogs and went horseback riding. But she said, "Fortunately, I have discovered that on weekends there are no autos in Central Park and I love to go bicycling there. Everybody looks so jolly and so happy and so much more friendly than they are in Cleveland!" I was startled to hear that. Also, my wife, who is from Ohio, has also said this to me. As soon as you can place yourself somewhere in New York where you are not overpowered by the noise and traffic and neon lights, then in a way New Yorkers are much more responsive people than they are in Columbus or Cleveland.

What I really want to say is that even in the worst U.S. cities, like New York, with its noise and environmental insults, it is very possible to create a physical environment in which people are quite happy. And that brings me to complain about something.

I believe I can say without exaggeration that American cities, most of them, have the most wonderful waterfronts of any cities in the world. I have traveled over much of the world and I don't think there is *any* city that can compare with New York City, with regard to its waterfront. We have the Hudson, we have the East River, we have the Harlem River, we have the oceanfront, and there are even some lakes within New York City. But it has spoiled those waterfronts like no other city in the world. And I think that is true in practically all American cities. In large European cities like London, Paris, and Berlin, which have



Park.

rivers that do not compare, cannot begin to compare, with what there is in New York, the waterfronts are enchanting. There are places where there are fine restaurants, where people go walking, where they are the most romantic parts of the city. It seems to me that in this country with the fantastic diversity and wealth of waterfronts we have, it is a national duty to create environments that are suitable to human life, for human pleasures. And if we did that, I think we would decrease the need for people to escape from New York every week-end. If we were to manage our waterfront the way London, or Paris or Berlin have managed their miserable ones, I think instead of driving 50 miles every week-end to go somewhere, many people would enjoy the waterfront. I think from the social, economic and pollution points of view it would contribute more to make poor people able to enjoy this city than anything else we could do, and from the energy-conservation point of view too.

I have been guiding the development of a new program organized under my name—the Rene Dubos Forum—that will explore human activities as they relate to nature. I am very encouraged by the fact that the National Endowment for the Humanities under the direction of Joseph Duffey has chosen to support these efforts. His desire to relate the social utility of the humanities to improving the American environment bodes well for the future.

I am not speaking of this as a scientific problem, although it has scientific ecological components, of course. But I am speaking of using the environment, improving it as a form of giving values to humanities in American life.

There seems to be an echo, in what you are saying about waterfronts, from Voltaire's *Candide*: "Let us cultivate our garden."

Yes, that conveys in part what I believe. When I talk at universities to students, they always want to discuss saving the globe, and I am all in favor of that of course. But I always answer, "It's very good to think about problems in a global way, I think it is a good intellectual exercise, but the only way where you can do something is in your own locality. So think globally, but act locally. If you cannot do something about that stream or those lovely marshlands in your town, then how do you think you are going to save the globe? That's exactly "Cultivate your garden." And then after that, you can perhaps think on the larger scale about global problems.

Dr. Dubos, you turned 77 in February. Looking back, what have been the most dramatic changes regarding the welfare of the planet and its inhabitants you have seen in your lifetime?

There is no doubt that the great revolution happened in the 1960's, and was a revolution in the minds of people. Something happened then which made people aware, probably first in

the Anglo-Saxon countries, that if we were to continue the way we were going, it would destroy everything. And this revolution was not only in the mind, it immediately was converted within a few years into action.

Now that movement has reached a country like France in a phenomenal way. I think in some ways there is more activity in France towards saving the environment than there is in this country. As perhaps you have seen in the last election, ten percent of the population voted the ecological ticket, it's a political ticket, so influential now that any political party in France has to talk ecologically. Obviously it was first most active in this country, and also in Great Britain, Sweden and Scandinavia.

What has most impressed me is how rapidly one can mobilize public opinion and do things in a particular place. So I will mention examples of two cities in which I had some activity. One is Seattle. As perhaps you know Lake Washington in Seattle ten years ago was said to be dead. A group of citizens began to save Lake Washington and after two or three years, they managed to have bonds floated to stop domestic as well as industrial pollution. And within seven years, without doing anything else, except to stop pollution, there was no longer any domestic sewage or industrial effluent flowing into the lake. Within seven years, Lake Washington returned to the state in which it was before the white man came in. Now that has had a fantastic impact in Seattle, because real estate values all around Lake Washington increased enormously. All sorts of pleasurable occasions became possible out on Lake Washington and the whole city of Seattle now is really transforming itself into a very pleasant city.

Now let me mention New York City. Jamaica Bay, adjacent to Kennedy Airport, for several decades had been used as a place where the city dumped its garbage. Every day, hundreds of trucks dumped garbage into the bay and there were 1,600 sewer lines feeding into it also. A few years ago a city employee of the Parks De-

“If I were Billy Graham, I would preach to people that the best way to save their souls is to save the environment of cities like New York.”

“In San Antonio, Texas, a miserable little river, it’s not even a river, it essentially was used as a sewer line, has been converted into an enchanting area. So it can be done.”

partment decided that he would, on his own, try to do something to save Jamaica Bay. He began planting trees on those garbage islands. Trees, shrubs, and so on. He was in the Parks Department. His name was Herbert Johnson. Then the city began to take an interest in it. It began to establish water treatment plants so that the sewers did not go into it. The bay began immediately to improve. Water birds came back. The oyster industry has started again. And other shellfish and fin fish, because rapidly conditions improved.

Something else happened, however. About four or five years ago, there was a plan to extend runways of JFK into Jamaica Bay because they wanted to enlarge the airport. The National Academy of Sciences planned a study of what would be the ecological consequences of extending the runways into the bay. That irritated me a great deal. I made a public statement that one did not need an ecological study which would take two or three years to know that extending the runways would damage Jamaica Bay. Well, the *Village Voice* played it up, then other environmental groups played it up, and somebody arranged a big meeting at Jamaica Bay in which several persons spoke and I was one of them. The New York Times sent people, and managed to take a photograph of me, saying that, if we do respect Jamaica Bay, allow it to evolve in an ecologically sound way, what we are going to have is a marvelous bird sanctuary, which it is now. It has the largest number of birds and diversity of birds on the East Coast, so I said we can have this and have it compatible with technological development. You could have the birds and you could have the jets on the other side.

The Times published the photograph, on the first page, with a statement. And shortly afterwards Governor Rockefeller decided that the Kennedy runways would not be extended. I am sure it was not my speech that convinced the Governor. It was just that public opinion could be aroused against it. So it is possible to sensitize public

opinion provided one finds issues meaningful to people. Now this has extended into something much bigger. You probably know that Congress established about two years ago the Gateway National Recreation Area which has the largest budget of any National Park. It includes Jamaica Bay, the Floyd Bennett airfield, Breezy Point, then Ft. Hamilton on Staten Island and Sandy Hook on the New Jersey coast. So all this is now a National Park—the first large urban park in the world. I have been involved in trying to formulate how man could take advantage of the waterfronts of New York City and create an urban national park which has a large psychological significance for the country, because so many millions of people, including me, entered this country through the Gateway. I helped former Interior Secretary Stuart Udall to write a manifesto which is being used now for the planning. The new management of Gateway has raised the potential to more than \$200 million in Federal money in capital improvements there. Now I understand that idea is being picked up by San Francisco to create something similar. All this demonstrates that a place like Jamaica Bay that was just for rats only 10 or 15 years ago can be converted into the most beautiful bird sanctuary on the East Coast. So that shows if we are willing to do things, we can save our environment. Even our urban environment.

Once you get it started, usually communities will respond. That’s why I’m more optimistic than many people are. I am told lots of wonderful things have happened in Minneapolis, for example. And in San Antonio, Texas, where a miserable little river, it’s not even a river, it was essentially used as a sewer line, has been converted into an enchanting area. So it can be done. The real problem is how can one mobilize public opinion and how can one make poor people realize that by so doing one contributes to the quality of their lives.

An elderly couple stroll down a tree-lined road in the Cuyahoga Valley National Recreation Area.





Do we need more environmental protection laws or do we have enough now?

My feeling is that there are enough, it is a question of enforcing them. One of my other activities is to serve on the Board of the Natural Resources Defense Council, chiefly as a scientific advisor. Their lawyers give me the impression that one does not need more legislation. It does exist. It is just the question of a place to apply it, so that there is a precedent. That's why Storm King was an extraordinary situation. I was flabbergasted when it happened. When Con-Edison presented their plan to build a reservoir up there, the local judge said that you could not do something that impinged on the value of the property of somebody else. The people with property facing Storm King said that the value of their property depended in part upon the scenic beauty of the place and that the beauty would be damaged by the reservoir. It is a precedent in the law now that aesthetic quality is a part of the value of your property.

Dr. Dubos, you wrote a biography of Pasteur that was republished with new material a few years ago. Why does this figure hold such significance for you?

He helped to create the science of medical microbiology, of course. But I became so interested in the environment during the past 15 years that on re-reading the documents, I revised my biography of Pasteur written 30 years ago. I realized there was in his scientific attitude an enormous ecological component, an enormous interest in the environment which nobody had perceived.

He worked with the microbes that cause disease, but he also stated that the ability of the microbes to cause disease depended on the total environment in which the person lived. You take a child who is infected with tubercle bacilli. If this child lives

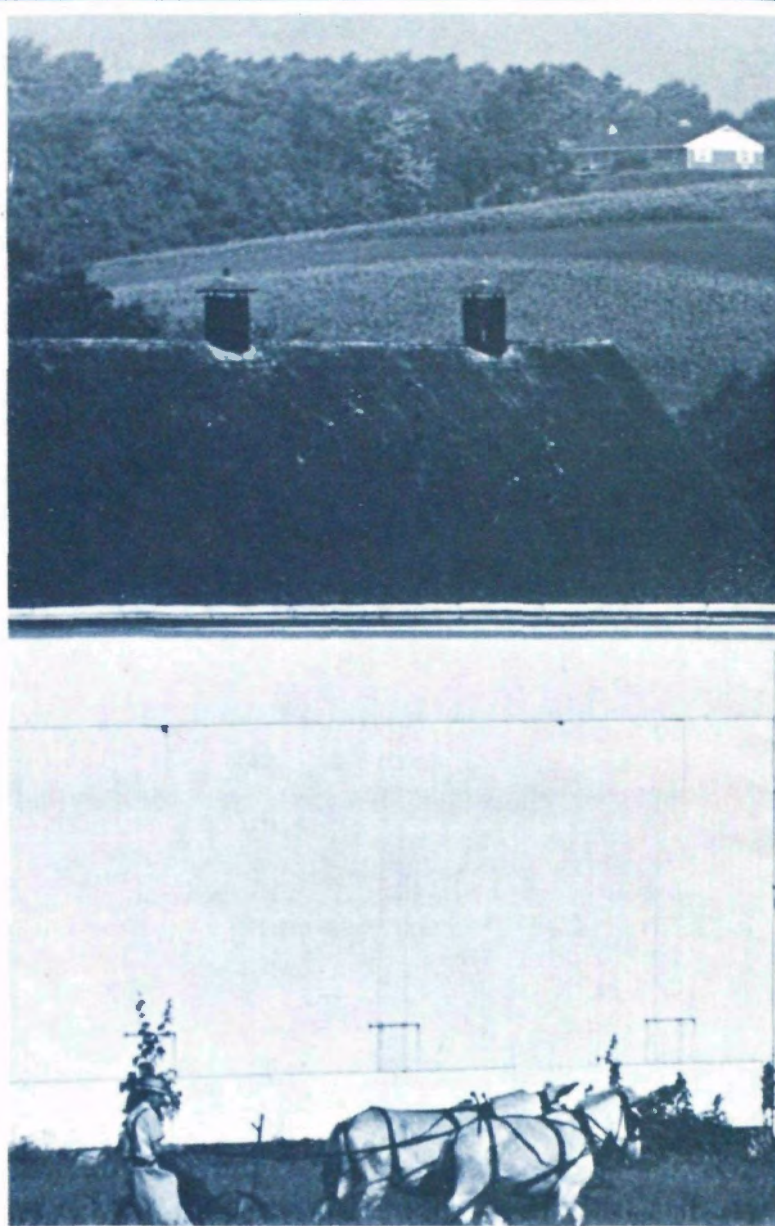
under miserable conditions, he will develop clinical tuberculosis and many die of it. But another child who lives in good environmental conditions will also have the infection but has a better chance to recover from it.

So Pasteur constantly emphasized that the total environment influences susceptibility and resistance to disease. And that had not been recognized. Having moved from being a pure bacteriologist myself to a person concerned with the effect of environment on people, I took all of Pasteur's writings and singled out those statements that he made, even though he couldn't do very much about it.

I think that now we are ready to enter a phase of environmental medicine where, yes, we can recognize the importance of microbes and that is very important, but we also can analyze the effect of the environment on the susceptibility of people to infection. So this is why I decided to republish my Pasteur book with that new chapter in the beginning.

By the way, I was sensitized to the problem for a very personal reason. I used to be a perfectly orthodox bacteriologist and in fact I published several successful text books.

In 1942, my first wife, who was French, developed tuberculosis. We lived at that time in Dobbs Ferry, New York, under very pleasant conditions. There was no reason that she should develop tuberculosis. So I looked into her past. I knew that she came from a part of France where Limoges china is made. I knew that her father, who was a china painter, had died about the age of 45, and by that time knowing what I knew of tuberculosis, I recognized that he had died of silico tuberculosis, which is a kind very common among people who inhale silica in the china industry. I recognized that as a young girl, 6 or 7, my first wife had a long bout of pulmonary disease which obviously was tuberculosis, but from which she recovered because she was not exposed to silica. Then she became a very healthy woman. But then the war came, with all sorts of tragedies. Even though she did not suffer physically from it, all sorts of tragedies



occurred in her French family which upset her tremendously. And what happened I am sure, even though it is impossible to prove, is that her old tuberculosis had become reactivated, and one knows that can happen.

So that made me become very much interested in the effect of the total environment on susceptibility of people to tuberculosis. And as a matter of fact I wrote a book called the *White Plague-Tuberculosis—Man—Society* in which I demonstrated that tuberculosis becomes an important disease any time a society is disorganized and where people are exposed to bad living conditions. It was a very common disease in the

19th century because of the industrial revolution and people moving from the country into the tenements of industrialized cities. And then as the conditions improved, Europe became wealthy, then tuberculosis began to become much less important. And the same thing is happening now in all parts of the world which were poor and are now becoming industrialized and where tuberculosis is a very common disease.

So I became involved in the effect of the environment upon tuberculosis, then more generally of the environment on infectious disease. And then finally the effect of the environment on the whole human life, and that is where I am now. That is why I put so much emphasis on



How Do You Say 'Dubos'?



People have trouble pronouncing Dubos. Some give it a French accent, and others try it in an English version.

Professor Dubos says actually both are used in France.

"In southern France, they say 'dew-boss.' But north of Paris where I came from, they say 'dew-bow,'" he explains. So you can take your pick.

At Rockefeller University, most people just call him Dr. "doo-bose."

the fact that we can improve our environment, and that a city like New York could have lots of wonderful waterfronts and parks. If we could manage them properly, people would live better, and wouldn't have to travel 50 miles to the country every week-end in all those enormous traffic jams, and we would save energy besides. People would become more pleasant. Human relationships would be improved. I think we could transform this city and at not an enormous cost either.

I think if I were Billy Graham, I would go out and preach to people that the best way to save their souls is to save the environment of cities like New York. □

Amish families typify the people who know how to preserve and improve their environment, according to Dr. Dubos.



The Role of Private Conservation Organizations

By Elvis J. Stahr
President, National Audubon Society

America's natural heritage is, by any standard, one of the most important elements of the total heritage of our people. Indeed, had our natural heritage been a much lesser one, we would be a much lesser Nation today. But we have exploited that heritage almost wantonly, and days of reckoning have a way of arriving. Indeed, they are with us today. Yet I submit that with fresh resolve to preserve, protect and defend what is left of our natural heritage, and to restore certain parts of it to the degree that is within our power, we will benefit both ourselves and our posterity.

How can this be done? I believe that it cannot be done without volunteer citizen action! And I will enlarge on this point.

Despite the importance of the roles of wildlife in the planet's life support systems, as Americans we must face up to the probability that it is going to become harder and harder to stimulate most of the people of

this world to be concerned about wildlife, or even about conservation or pollution, in a serious way. Why? Three things are happening concurrently: escalating growth in the total number of people; escalating growth in the per capita pressures and demands which those people are placing on the Earth's resources, and, in most parts of the world, the congregating of the people in cities, where wildlife and wild places can or do seem terribly remote.

Urban dwellers forget how much their own survival depends on what's outside the city. No urban population could exist more than a few days on its own resources—of food, energy, water, materials. Yet most city dwellers seem to think of the world in terms of the city. They see many problems which are difficult and enormous. But these will not be alleviated, only exacerbated, if urban people concentrate on urban problems to the extent that they ignore or make shortsighted decisions concerning the natural world on which all life, including their own, ultimately depends.

No one can offer or promise simple, quick or cheap solutions. Government alone cannot develop them. I submit the private sector must be involved, lest government itself pay too little heed to the world outside the cities where so many of the voters are. Involved how? I see that as the role of private citizens—working through conservation organizations.

Ever since they federated loosely but effectively to throw off British rule, American citizens have exhibited a gift for organizing themselves to advance causes they believe in. Both men and women have the same proclivity. If conservation laws and wildlife management programs are stronger and further advanced in the United States than in other nations of the world—and there is considerable evidence that this is so—our progress can be attributed in large measure to this peculiar inclination and ability of the American citizen.

The American revolution was fought and won by volunteers, and voluntarism has been a continuing, vitalizing element in American society. The conservation movement began and has continued because hundreds of thousands of volunteers in this country want it and are willing to work for it extra hours, night-times, and weekends. Most remain not only unpaid but unsung. Yet they are the grass-roots and lifeblood of every private conservation organization that depends on members.

The combined force and effect of citizen organizations working to protect, conserve, and manage wildlife and other natural resources, and to study and understand the biology and ecology of species, has been known as the conservation movement. Now, in the popular lexicon, the broader phrase, environmental movement, has

supplanted conservation—but environmentalism includes the concepts of conservation.

Movement is a remarkably descriptive noun. To study the history of citizen wildlife organizations, their origins, their rise, and sometimes their fall and disappearance, their splittings and spin-offs and coalescings, and the continuing emergence of new groups, is to perceive a bubbling cauldron of private endeavor—and a peculiarly American phenomenon.

Private conservation organizations emerge more or less coincidentally with the crossing of the last frontier in the lower 48 and the yeasty period of Teddy Roosevelt's presidency. Actually the roots of the movement go back to 1886 and the founding of the early Audubon societies in the East, and the Sierra Club in the West, and even to the American Forestry Association in 1875 and the American Fisheries Society in 1870.

Few Americans, however, were very much concerned right up to the late 1960's. Numerous other private organizations sprang up in the meantime and the persistent work of all helped prepare the way so well that when the general public in increasing numbers began to see and smell the gross pollution of their air and water and widening abuses of their land, millions of people were ready for a genuine turnaround in attitudes toward pollution, toward natural resources, and toward the relations between economics and ecology. Those attitudes obviously have a bearing on the welfare—or lack of it—of wildlife.

An early result of the turnaround was the National Environmental Policy Act of 1969, which remains the most significant single weapon of environmental conservation, in my opinion. Among other things it includes an all-important declaration of *dependence*—the dependence of man upon nature—and of the necessity that man learn to live with nature in productive harmony. And only a few months after it became law, the volunteers began to muster in new strength. Like those who mustered on the village green in Lexington long ago, many were young and untrained, yet they demanded and got attention.

But who laid the groundwork and still carries the brunt of the battle? Who are the private organizations? Actually there are five basic types: large membership organizations, institutes, professional and scientific societies, environmental law organizations, and coalitions formed to coordinate the efforts of several organizations.

Among the large membership organizations are the National Wildlife Federation, National Audubon Society, Sierra Club, Izaak Walton League of America, the Wilderness Society, Defenders of Wildlife, the National Parks and Conservation Association and Friends of the Earth. The American Forestry Association, whose primary thrust has been toward the conservation and

scientific management of forests, belongs in this category.

These organizations and their State and local affiliates deliver political clout from the grass-roots without which the most skillful lobbyists in Washington or a State capital can exercise only limited influence. On occasions when they deliver their grass-roots clout in concert, Federal policies or projects have been stopped, started, or redirected. They do this very sparingly, however.

Second, the institutes. Among them are the Wildlife Management Institute, the Sport Fishing Institute, and the Conservation Foundation. Characteristically, institutes engage highly qualified professionals to encourage and sometimes to conduct research; to promote the application of science in fish and wildlife management; to carry out educational programs beamed at the public and the profession; and to help guide and coordinate the membership organizations.

The third kind of organization is the professional or scientific society, in a sense primal to the whole conservation movement. Though small in point of numbers of members, they have exercised profound influence on the conservation movement. We're all familiar with the Wildlife Society and the American Ornithologists' Union. These societies have made their contributions chiefly in the promotion and publication of research and the dissemination of professional knowledge based on experience. They provide the base of knowledge upon which the lay organizations build their organizational and action programs.

Environmental law organizations are a relatively new phenomenon. Best known are the Environmental Defense Fund, which had its birth at a National Audubon Convention in 1967, and the Natural Resources Defense Council, organized in 1970. EDF and NRDC were formed to use law and science to fight environmental battles in the courts and in administrative proceedings and have won some spectacular victories with far-reaching benefits to the environment. The Center for Law and Social Policy, the Environmental Law Institute, and a number of other groups around the country also fall in the fourth category.

The fifth type is the council or "coalition," established on a permanent or ad hoc basis, to coordinate the work of a number of organizations. The oldest is the Natural Resources Council of America, in which 46 national and regional organizations hold membership. The NRCA has arranged conferences with Presidents, Cabinet members, and other high administration officials where each participant spoke the views of his own organization. Those views generally have coincided, however, and have influenced major decisions more than once. Similar

councils have been established in many States. In addition, ad hoc coalitions for action on single issues are common, sometimes quite informal but nevertheless effective.

Let's look a little further at what the private organizations do, really, to influence private actions and public policy in the conservation and management of wildlife and other natural resources. Their major functions fall into several clearly discernible classes: Private organizations initiate new government agencies, reform old ones, and start new programs. They go to court to secure enforcement of conservation laws, or to establish new interpretations of old laws. They have sued to force government agencies to implement the law, and have also intervened in support of agencies trying to implement it.

They have engaged legal counsel to utilize all manner of proceedings affecting natural resources under the Administrative Procedures Act, and have engaged in similar quasi-judicial processes at the State level.

These same organizations conduct educational programs—ranging from courses and materials for school children to the publication of periodicals with large circulations, issue press releases, and hold press conferences. They also seek exposure via the air waves, some producing series of radio and TV "spots" designed to take advantage of the public service time required of broadcasting stations. Some produce television specials and others sponsor wildlife films.

Some private conservation organizations raise money to buy land for wildlife. One organization, the Nature Conservancy, has specialized in this field since 1950 and has purchased or had bequeathed to it more than a million acres, most of which have wound up as important additions to the National Wildlife Refuge System, in National Parks or National Forests, or in preserves administered by State or local government agencies.

At least three more deserve mention for their land acquisitions: The World Wildlife Fund U.S. Appeal exists primarily to raise money for important wildlife projects that governments cannot or will not fund. Ducks Unlimited secures contributions from individual hunters and some corporations to acquire waterfowl habitat here and in Canada. The National Audubon Society now protects and manages some 67 wildlife sanctuaries from Maine to California.

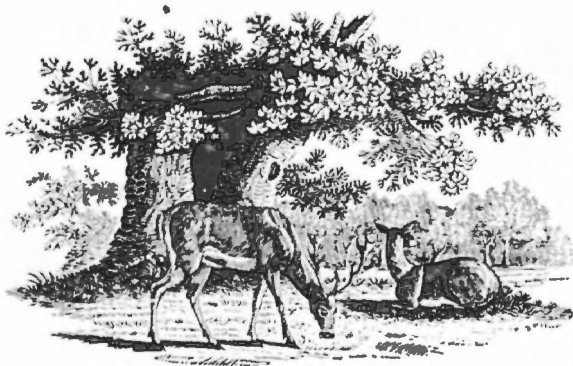
Private organizations conduct or sponsor research, as has been noted. They also fight local battles to save habitats. Using any or all of the methods and tools employed by the national organizations, local conservation clubs or chapters fight battles—against pollution, drainage, land clearing, and construction projects—all over the United States that would destroy wildlife habitat

Continued to page 37

(The following article contains brief profiles on the groups described by Elvis Stahr, president of the Audubon Society, as being among the major environmental membership organizations.)

Major Environmental Groups

By Terry Fleishman



The environmental movement, like a maturing tree, has been developing for a long time. It has strong roots, nurtured by the philosophy of conservationists who gained prominence in the 19th century. And like a healthy tree, it continues to surprise us with vigorous new branches.

This article is about some of the men and women and their contributions, then and now, to the broad concept known as environmentalism. The movement cannot be characterized by a single issue or cause; over the years it has changed both its direction and its techniques for achieving new goals. But one quality seems to have persisted in its decades of growth: the movement thrives on controversy. Indeed, its many battles for a better America and the protection of both wildlife and natural resources have generated publicity, funds and membership to aid these causes.

Terry Fleishman is a member of the EPA Office of Public Awareness Headquarters staff.

One of the earliest struggles centered nearly a century ago on the threatened extinction of many aquatic birds. In the 1880's hunters, attracted by a profitable and hungry market for bird plumage, were rapidly exterminating beautiful southern coast wading birds such as egrets. When the species began to disappear, the hunters pointed their guns toward terns and gulls of the northern shores, and for another decade the killing went on. Almost every fashionable woman of that period, it seems, liked to wear the plumes of egrets and terns in her hats.

They did not reckon, however, on a redoubtable lady, Mrs. Augustus Hemenway of Boston, who called a meeting of the new Massachusetts Audubon Society at her home on February 10, 1896. The meeting was not only attended by bird lovers and cultivated women who were repelled by the wearing of hats decorated with plumage but also by men who liked to hunt.

Despite this odd mixture, the participants endorsed the Audubon goal, as stated in its bylaws: "To discourage the buying and wearing, for ornamental purposes of the feathers of any wild birds except ducks and gamebirds and to otherwise further the protection of native birds." Later, 'except ducks and gamebirds' was omitted.

Some of the group's first officers included William Brewster, a curator at Harvard and the club's first President, and the following Vice Presidents: Charles Francis Adams, Sarah Orne Jewett and Mrs. Louis Agassiz. At the end of the club's first year, its membership reached almost 1,300, many of whom were children. The Massachusetts Audubon is still a separate organization from the National group.

Battle lines were drawn as poachers murdered Audubon wardens. The task of changing the attitudes of turn-of-the-century Americans in regard to terns and egrets created Audubon's framework of membership and club motivation.

After Audubon established sanctuaries and changed hunting laws, it was widely regarded as an upper-middle-class club functioning in a stylish aris-

tocratic way, and could have remained simply as a bird-watcher group. But the environmental problems of the 1960's and the public demand for clean air and water changed all this, presenting the Society with a whole new set of challenges it had not encountered since its founding. The result was a new struggle and a dramatic rise in membership. Before the 1960's, Audubon's annual budget was below \$1 million. It now exceeds \$10 million with a membership of 400,000 and chapter members in 400 cities and towns.

Since the turn of the century the Audubon Society has been attempting to build a public awareness of the need to conserve all our natural resources, but its conservation priorities today promote the conservation of wildlife and the natural environment, support public and private measures for abatement and prevention of all forms of environmental pollution, encourage a national land-use policy and land use planning, protect the public interest in public lands, recommend reform of national water policy, work for formulation of a national energy policy, change our national transportation policy from emphasis on highways to mass transit, cooperate with the United Nations, public and private agencies on international conservation and advocate the stabilization of human population—basic to preservation of environmental quality.



Another environmental group was founded at the end of the 19th century after John Muir, a conservationist and poet, warned of man's damage to the Sierras, which he loved. Anticipating Barry Commoner by many decades, he observed: "When we try to pick out anything by itself we find it hitched to everything else in the universe." Around 1889, Muir and Robert Underwood Johnson, associate editor of *Century Magazine*, combined efforts to persuade Congress to form Yosemite National Park which would secure the high mountain region encompassing Yosemite Valley. As a result, the park was created in the autumn of 1890. Concurrently, a small group of conservationists lobbied for the establishment of two other national parks, Sequoia and General Grant, to protect southern Sierra's big trees. Since the creation of these parks didn't guarantee their survival from the threats of sheep-grazing and forest fires, Muir concurred with Johnson's proposal to create a "Yellowstone and Yosemite Defense Association," an idea suggested by an officer of the Boone and Crockett Club to protect California parks. Their concerns, shared by others, included forming an organization to protect mountain wilderness and make the Sierras better known and more accessible.

In 1892, the Sierra Club was founded by recreationists and conservationists with Muir as its first president. The main goals of the club were: "To explore, enjoy and render accessible the mountain regions of the Pacific Coast; to publish authentic information concern-

ing them; to enlist the support and co-operation of the people and government in preserving the forests and other natural features of the Sierra Nevada..."

The club worked diligently to achieve its goals of forest and mountain wilderness preservation in the west, especially the Sierra Nevada mountains. Its membership grew steadily, due to the popularity of the early mountain hikes in the Sierras. The club, however, remained a small conservation and outing organization until well after World War II. After its involvement in the drive to preserve Dinosaur National Monument, the Sierra Club joined the ranks of leaders of American environmental organizations.

This campaign, aimed at blocking the 1953 construction of Echo Park dam in Dinosaur National Monument on the Colorado-Utah border, was one of the most intense projects the club had ever undertaken and its victory demonstrated the nationwide political power of the conservation movement. There were raft trips down the Yampa River to dramatize the issue, and a flood of bulletins, films, articles, ads, and letters to the press. Sierra Club executive director, David Brower, coordinated the drive with citizen groups across the Nation, including the Wilderness Society. Appearing before congressional committees, he exposed erroneous data and showed that other sites for dams were available. In addition, he argued that the Echo Park dam might never be necessary and that water

needed downstream would be lost to evaporation. Eventually, Dinosaur National Monument stayed intact.

Although a later battle over a dam at Glen Canyon was lost, the Sierra Club had laid the framework for future campaigns against dam proposals. Also, technology provided alternatives to hydroelectric power to pump water to the lower Colorado River States for irrigation and other uses.

By 1960, the Sierra Club was represented in nearly every State and in 15 foreign countries. Furthermore, it turned to new directions in environmental issues such as sonic booms from airplanes, urban sprawl, excessive use of pesticides, protection of coastal areas, a national wilderness bill, and a concern with the overuse and misuse of recreational facilities. Yet it still kept on familiar footing with opposition to a suggested trans-Sierra road and dams in national parks.

As Sierra Club President J. William Futrell observed last year, "It is time to rethink the battle lines of the sixties and early seventies. Citizens should now begin to look to the problems of the decade ahead." Futrell said the club plans to center its attentions on the problems of U.S. cities and the protection of the typical urban citizen. "Environmentalists are going to have to realize that the future of places like Yellowstone Park," he declared, "is going to depend on the future of places like Watts and Harlem."

The Sierra Club's present membership is 175,000 members, representing a growth rate of about 8 percent a year.

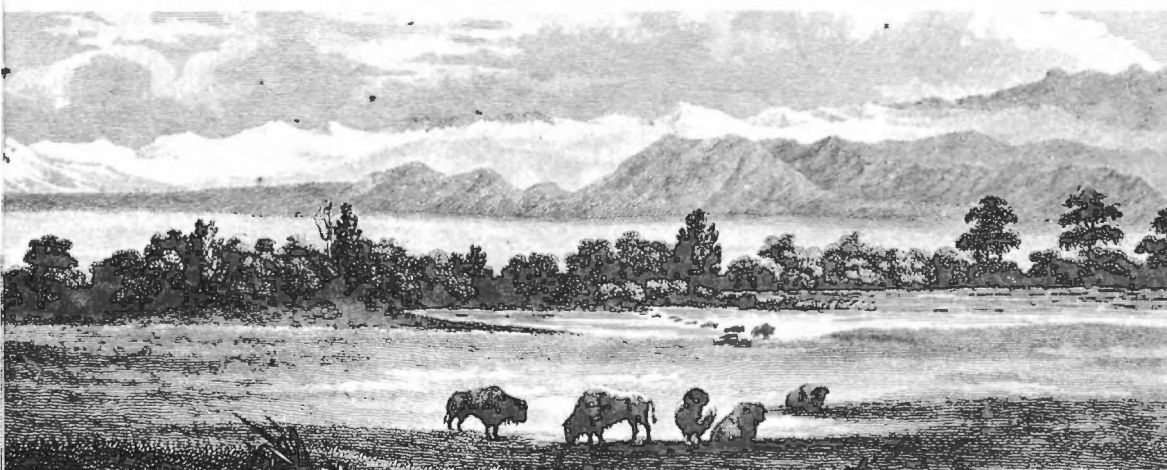
One of the oldest conservation groups in the U.S. is the American Forestry Association. It was founded in 1875 by Dr. John Warder, a physician and horticulturist, and aimed for "the protection of the existing forests of the country from unnecessary waste, and the promotion of the propagation and planting of useful trees."

The AFA helped popularize Arbor Day as far back as 1882 by sponsoring tree plantings. In its early years the Association pressed for laws to protect the forests on public lands, to prevent wasteful forest fires, and to set aside preserves of forest lands. Among the areas that later resulted from its interest were the national forests in the White Mountains and the Appalachians. In the 1920's the AFA successfully pressed for enactment of the Clarke-McNary Law, which promoted Federal aid to States for forest fire prevention, provided matching Federal funds for reforestation efforts, and allowed for expanded national acquisition of forest lands.

In 1933 the Association inaugurated summer excursions called Trail Riders of the Wilderness to take small groups on horseback into roadless areas. Trail Riders now has expanded to include canoe trips to the Allagash and Boundary Waters Areas as well as horseback excursions into the mountains.

In 1940 the AFA started the Social Register of Big Trees to list the Nation's largest specimens of native trees.

The American Forestry Association today continues its tradition of forest conservation and education through its 75,000 members.



No account of environmental groups would be complete for the United States without mention of the National Parks and Conservation Association. Established in 1919 as the National Parks Association, it belongs to the tradition of conservation-oriented organizations in Washington, D.C., and has concentrated most of its interest and activity on the goal of protecting and preserving national parks and monuments. Its founder was Stephen Mather, first director of the National Park Service.

In 1970 the organization approved a change to its present title, and it has demonstrated in recent times a broadened interest in environment, including wildlife, wilderness, recreation, open spaces, rivers, oceans, pollution, energy and related matters. NPCA's concerns include assuring that the Nation's parks "remain open to the public—well staffed, in good repair and free of mining, pollution, commercialization and overdevelopment."

In addition, the Association's activities include enforcement of the Endangered Species Act; preservation of areas such as the Appalachian Trail and establishment of a Greenline Park System to protect ecological and cultural sites via Federal-State cooperation; better environmental management of National Forests; a retreat from nuclear power and support of other forms of energy including solar, geothermal, wind, and hydrogen; support of public transit in place of private autos for downtown areas; and a changeover from chemical pesticides to organic and integrated pest control.

NPCA currently has about 45,000 members and its budget last year was approximately \$927,000.

The philosophy of the Wilderness Society was anticipated well before its founding. Some of the great thinkers of the mid-nineteenth century, men of sensitivity like Thoreau and Emerson, had expressed the need to preserve the wilderness. To them, saving it meant not only preserving the quality of life but also the human spirit.

In the 20th century proponents of this philosophy, while sharing the sentiments of Thoreau and Emerson, had an even bigger burden, for the destruction of wilderness by man's activities was increasing at an alarming rate.

Robert Marshall, a 20th century forester, requested the immediate establishment of enough tracts of land "to insure everyone who hungers for it a generous opportunity of enjoying wilderness isolation..." He urged the union of all supporters of this program and stated his reasons: "There is just one hope of repulsing the tyrannical ambition of civilization to conquer every niche on the whole earth. That hope is the organization of spirited people who will fight for the freedom of the wilderness."

In January, 1935, the Wilderness Society was formed to embrace that proposal.

In subsequent years it became evident to members of the Society and other conservationists that administrative protection of remaining wilderness areas by Federal agencies

was transitory. Society members accordingly outlined a model wilderness law, which eventually inspired the introduction of legislation in 1956. After eight years of campaigning by conservationists, the Wilderness Act became law on Sept. 3, 1964, giving immediate protection to almost 10 million acres of wild country, and providing for evaluation and enactment of additions.

Today approximately 12 million acres are included in the National Wilderness Protection System and many additional areas are being studied for inclusion. The Society is working toward this goal, as well as saving the wild places in Alaska by the creation of more than 100 million acres of new Alaskan national parks, wildlife refuges, protected forests and wild rivers. In addition, its agenda includes winning Wilderness System protection of Federal wildlands now managed by the Bureau of Land Management; protecting over 50 million acres of national forest roadless areas; including remaining free-flowing wild rivers in the National Wild and Scenic River System, and preserving critical wildlife habitat. The Society has also been involved in some contemporary environmental issues such as strip mining legislation.

The Wilderness Society currently has about 70,000 members.

The Izaak Walton League adopted its name from a noted seventeenth century English philosopher and angler whose concern stretched beyond fishing and the quality of water to all natural resources. On January 14, 1922, a group of 54 sportsmen and outdoor writers from both coasts of the United States convened in the Chicago Athletic Club to organize the League. Will H. Dill, the organization's first president, spoke to them about America's forests, rivers and waterfowl, which were being affected by pollution.

The League's history and interests, which now encompass diverse areas such as wildlife conservation, land preservation, and clean water, originally concentrated on the restoration of fish and wildlife. In 1924, the League established the 300,000-acre Upper Mississippi River Wildlife and Fish Refuge. This was followed by the 1925 purchase of 2,000 acres of critical elk winter range in Jackson Hole, Wyoming, which saved a great elk herd and helped establish the National Elk Refuge. Later on, the League worked toward its goals through such laws as the Fish and Wildlife Coordination Act of 1946 and the Marine Mammals Act of 1972. It was active in the preservation of wilderness areas in northern Minnesota—the Boundary Waters Canoe Area. Along with the IWLA Endowment Inc., the group set aside thousands of acres for present and future generations.

The League's concern with clean water stemmed from President Calvin Coolidge's request for the League to survey the extent of the Nation's water pollution problems, the first study of its kind. This concern has not dwindled through the years, and the group's recent manual entitled, "A Citizen's Guide to Clean Water", is a popular handbook for citizens who want to affect implementation of the Clean Water Act.

The organization has multiplied its original membership many times since its inception, reaching a total of 51,000 today. It endeavors to educate citizens to conserve the soil, forest, water and other natural resources, and encourages the appreciation and proper use of them.



In the National Wildlife Federation's founding history, an American President played a key role. Franklin D. Roosevelt in 1936 called a meeting of the first North American Wildlife Conference "to bring together all interested organizations, agencies, and individuals in behalf of restoration of land, water, forests and wildlife resources."

The Conference brought about almost unanimous agreement among 1,500 conservationists to coordinate the endeavors of all conservation organizations and encourage all levels of government to support conservation programs. Jay Norwood "Ding" Darling, a Pulitzer Prize-winning cartoonist and conservationist, stressed the need not only to have a unified program but also unified pressure. In this manner, citizens could effectively bring conservation issues before their legislators. Eventually, the group voted on forming an organization encompassing these beliefs. Initially the group was called the General Wildlife Federation (later renamed National Wildlife Federation), whose proposed constitution began, "Believing that the natural resources of this continent are economic, social, recreational, and aesthetic assets which should be restored and perpetuated for our posterity, and realizing that this be achieved only through an aroused and enlightened opinion among the people of this Nation, we dedicate this Federation..."

On March 3, 1937, during the Federation's first annual meeting, the proposed constitution of 1936 was ratified and Darling was acclaimed as the first President.

He recommended that this group make Wildlife Restoration Week (now known as National Wildlife Week) its first priority. The event has been celebrated annually ever since.

Towards the end of 1937, he also initiated the successful program of selling wildlife stamps to save the group from bankruptcy. Today, these stamps still help to stabilize the Federation's finances.

In its early years, the Federation, like the Izaak Walton League, was involved in the passage of the Pittman-Robertson Act which enabled States to obtain and develop wildlife areas by taxing hunters' guns and ammunition.

Later on, the group shifted its emphasis to conservation education. Currently, the group distributes literature, conducts seminars, and maintains nature centers or "ecology camps" for children.

Also, NWF's accomplishments include support of the Endangered Species Act passed in 1966 and strengthening amendments in 1969 and 1973; support of measures to increase deer, wild turkey, and whooping crane populations; establishment of a wildlife refuge system and support of the National Environmental Policy Act of 1969.

In its literature, the Federation recruits members by asking them to support protection of wildlife habitat; to join in the struggle for clean streams, rivers and oceans; to help save disappearing wetlands; to help rid the environment of toxic chemicals; to help bring back threatened wildlife; and to spread the message about the value of abundant and diverse wildlife.

The Federation is the largest of U.S. environmental citizen groups with a total of 3,500,000 members.

One of the youngest of the organizations that came into being as the environmental movement gained fresh impetus in the past decade was Friends of the Earth, Inc., founded in 1969 by David Brower with headquarters today in San Francisco.

The organization is dedicated to "the preservation, restoration and rational use of the ecosystem." One of its officials, Rafe Pomerance, served as a legislative coordinator of the National Clean Air Coalition that led the campaign for a strong Clean Air Act. Friends of the Earth (FOE) played a role in halting U.S. production of the supersonic transport aircraft, and has made a significant contribution in other issues such as delaying construction of the trans-Alaska pipeline; abolition of the Atomic Energy Commission and reassignment of its promotion and regulatory functions to separate agencies; saving Yosemite from a convention center and other development; raising public consciousness about wearing wild animal fur; supporting legislation to preserve 80 million acres of Alaskan wilderness, and halting the Cross-Florida Barge Canal and a jetport in the Everglades.

Recently the organization has been leading public debate over the desirability of "soft" renewable energy sources compared to "hard" nonrenewable and nuclear technologies.

FOE also has published more than 40 books on wild areas and environmental problems. It currently has about 25,000 members.

Defenders of Wildlife was founded in 1925 as the "Anti-Steel Trap League" by Colonel Edward Breck, a veteran of World War I who had wide interests ranging from amateur fencing to protection of wild animals. The organization subsequently was renamed "Defenders of Furbearers" and finally assumed its present title about two decades ago, reflecting its concern with preserving many forms of wildlife.

Among its major campaigns has been support in framing and enactment of the Marine Mammals Protection Act of 1972, the Endangered Species Act of 1973, and a host of earlier measures to protect America's wildlife.

The organization's activities currently include monitoring the implementation of these laws, as well as inspection of roadside zoos and menageries to assure humane treatment of animals. Its stated philosophy includes opposition to predator poisoning and trapping on public lands in the United States; opposition to imports of exotic species of animals that could harm native ecosystems; preservation of public lands against domination or abuse by private economic interests, proper management and preservation of migratory birds, and support of the proposed ten-year moratorium on commercial whaling. It also maintains the 25,000 acre George Whittell Memorial Wildlife Preserve around the Aravaipa Canyon Primitive Area in Arizona.

Defenders of Wildlife has about 36,000 members and an annual budget of approximately \$1.5 million. □



Sun Day

By Tom McMurtrie

Sun Day is May 3rd. Just as Earth Day in 1970 alerted people to the problems of environmental pollution, Sun Day hopes to alert people to the vast potential in solar energy. Through teach-ins, demonstrations, exhibitions, and other events around the country, Sun Day will emphasize that solar is here today; and that with a trained labor force and Federal subsidies similar to those oil and nuclear fuels have received, solar energy can begin to take a substantial, if somewhat belated role in the energy market.

It is with a certain sense of frustration that solar energy advocates have watched this country's energy development over the past few decades. As early as 1952, the Paley Commission was recommending to President Truman that solar energy could provide a viable energy alternative; and that, in light of our limited fossil fuels, a massive effort should be made to convert up to 13 million homes and commercial buildings to solar heating by 1975.

As we are well aware, however, this effort never came about. The primary push has been in the accelerated consumption of fossil fuels. Massive depletion allowances have pumped oil out of the ground at unprecedented rates. Low interest loans have laid a vast pipeline network, making possible the widespread consumption of natural gas.

These actions have encouraged a prodigious national appetite for oil and natural gas, an appetite which went mostly unchecked through the 60's and early 70's. Not until an oil embargo in 1973 and natural gas shortages in 1977 did Americans wake up to the fact that oil and gas might not be able to meet all their future growth needs in energy.

Money talks, and it often has many different messages. One of the fortunate consequences of our present energy dilemma is that people are finally beginning to take a serious look at solar energy. And most like what they see. Although the initial installation costs for solar systems are rather high, they begin to look reasonable when spread out over a period of years; especially in light of the sharp fuel cost rises that will most likely take place.

Solar energy has always had a core of believers. The Sun's energy is virtually limitless; it is clean, and generally works best



when it's decentralized, thus avoiding transmission lines, pipelines, tankers, and the like. In many ways, solar energy is the ultimate energy resource, allowing individuals to live in comfort with minimum disruption to their environment.

People unfamiliar with solar technology often envision it as an exotic and futuristic solution. In many ways, though, designing an efficient building that is heated or cooled by the sun represents a return to an age when architecture had a more practical orientation. Before the "cheap energy" era, buildings always took the environment into consideration; thick adobe walls helped keep houses cool in the Southwest, and wood-heated homes used local fuel in the Northeast and Midwest.

Today, people are literally going underground, building houses that are buried on three sides and open to the sun towards the south. Simple, intelligent designs such as this represent enormous savings in heating and cooling. Undoubtedly, as fuel costs rise, the demand for efficiently designed solar homes will also go up. Unfortunately, the housing industry has been reluctant in making the necessary changes. More States need to follow California's example, where not only is there an enormous effort to

educate the public on the benefits of going solar; but the State is also giving the effort substantial support by proposing guarantee programs, setting standards for the solar industry, and by providing ample tax credits for financing solar systems.

Over the years, two basic categories of direct solar space heating have evolved, with many variations of each. The passive system is exemplified by the underground house described above, where the south side is simply exposed to absorb sunlight. Generally, there is some sort of collector to absorb the heat radiated by the sunlight, whether it be water-filled drums lying next to the window or waterbeds lying on the roof.

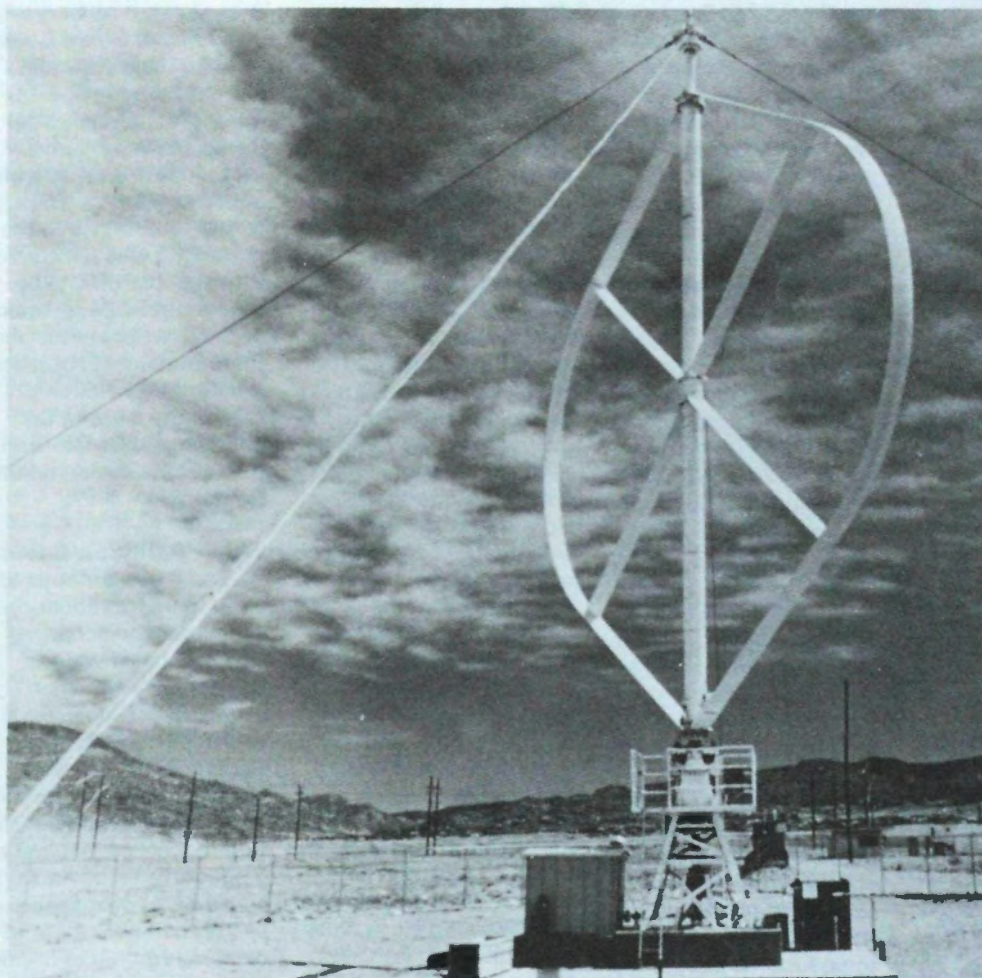
The second category of direct solar space heating is the active system, in which water or other fluids pass over a surface heated by the Sun (the active collector); this heat is then transferred to the home through a radiator or similar device. The active system has many variations, both in the type of collector and in the way the heat is retained and dispersed.

In terms of costs, the average direct solar heating systems (installed in well-insulated homes) are found to be competitive with electrical heat in all parts of the country except the Northwest, where hydroelectric power remains cheap. When compared with conventional gas and oil heating systems, solar heating comes out costing a little more, although the gap is fast closing.

The ironic situation here is with electric heat. Fully 50% of housing starts today are electrically heated. Nowhere near that number are solar heated, pointing to a hesitancy in the housing industry to make the jump to solar, even when economics support it. Unfortunately, these short-sighted actions will lead to further strains in the Nation's utility systems, forcing them to build expensive new generating capacity that would otherwise not be needed. The end result of this folly will be a higher electric bill for all of us. Sun Day would like to put a damper on this by pointing to solar heat as a realistic, economic alternative to electric heat.

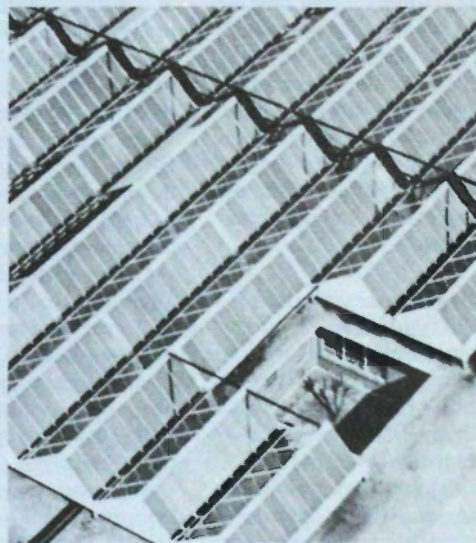
Sun Day also hopes to address itself to indirect solar energy systems. These systems, such as wind energy, hydroelectric power, wood burning, and biomass conver-

Tom McMurtrie is a public affairs liaison officer for Solar Action, Inc.



This eggbeater-shaped wind turbine being tested by the Department of Energy uses the same principles as the old-time windmills to derive energy from moving air currents.

Solar collectors on the roof of an Atlanta, Ga. school are used for heating and cooling, as part of a Department of Energy solar project.



sion, represent a tremendous wealth of untapped energy resources. For example, it has been estimated that the hydroelectric potential at flood-control dams and abandoned hydro sites around the country is as great as all nuclear energy presently produced domestically. (Coincidentally, many of these hydroelectric sites are in New England, which has relatively high energy costs.) Many of these sites are small and until recently weren't considered worth bothering with. The advent of higher utility costs, however, has shed new economic light on this very accessible potential.

Wind is also an enormous untapped resource. At the beginning of the century, before the introduction of rural electricity, most farms were powered by small windmills. Today corporate structures like Rockwell and National Air and Space Administration are experimenting on large scale windmills with limited success. As with dams, however, there is tremendous potential for the "small" thinker. Small, single-home windmills are simple, and have been proven effective. Sun Day will encourage people to examine these closely.

Like the environment it strives to balance itself with, the ideal solar system would be a multiple system, making the most efficient use of energy potentials that exist around it. One of the problems with solar energy systems is that the energy isn't always avail-

able when you want it. Multiples of hybrid systems would help alleviate that problem. An example would be the combination of a windmill with a hydroelectric dam, where the windmill would generate power when the wind was blowing, and water would be let through the dam during calm periods. Such a solution would solve the frustrating and often costly problem of energy storage by using facilities that already exist.

Another area of great interest is that of photovoltaic cells, or solar cells. These were originally developed for the space program on a limited scale and at a very high cost. Since their introduction, prices have dropped to a fraction of what they used to be. However, they still average out to being 6 to 15 times more expensive than current utility rates. Much of this has to do with the fact that the industry is not yet fully automated and mass producing. A parallel can be drawn with the situation of the transistor industry in the 1950's. When transistors were introduced, the costs were prohibitive; it took a substantial government subsidy to get them mass produced, which in turn triggered an enormous price drop that made the transistor economically feasible. Sun Day will advocate a similar program for photovoltaic cells to accelerate the price decreases which are already taking place. Depending on decisions like these, it is estimated that photovoltaic cells will be compet-

itive with conventional sources of electricity by 1985 or earlier.

At this time, there remain a lot of specific unknowns in America's future. But the general trend is fairly easy to see. The 1980's will be a period of tightening oil and gas supplies. The resulting price increases will force Americans to examine alternatives more closely. Those with the common sense to accept this eventuality now and plan sensibly for it will be better off in the long run.

Sun Day is meant to help people see these energy facts more clearly. Given a fair chance, solar energy can make a difference. Under the proper incentives and guidance, the Sun will provide clean, abundant energy for everyone's benefits. □

Hundreds of activities are currently being planned across the Nation for Sun Day, May 30. If you are interested in showing your support for solar energy and would like to participate in Sun Day, you may contact:

SUN DAY
1028 Connecticut Ave, NW
Suite 1100
Washington, DC 20036
Phone: (202) 466-6880

They will put you in touch with other members in your community who are interested in Sun Day activities and will help you in planning your activities.

Around the Nation

1 REGION

Noise Workshop

The Noise Office recently conducted a one-day workshop on noise abatement and control for high school science teachers of eastern Massachusetts. Topics on the agenda included major noise sources and their control, techniques of community noise measurement, and physiological effects of noise. Each participant received teaching materials dealing with environmental noise.

Preliminary Permit

The Region has made a preliminary determination that the construction of a proposed 250,000 barrel per day petroleum refinery in Eastport, Me. will not result in significant deterioration of air quality. The Pittston Co., which proposes to build the refinery, submitted a revised design to EPA last November for review in accordance with the prevention of significant deterioration of air quality regulations. After reviewing the air quality data and the projected impacts of the facility, the Regional Office made a preliminary determination that the facility will not violate the national ambient air quality standards and that the proposed control technology represents the best available control technology for particulates and sulfur dioxide.

2 REGION

PBB Update

Region 2 announced recently that there is no immediate health risk to two New Jersey communities from polybrominated biphenyls (PBB's). The announcement was made at a public meeting held in New Jersey on the need to control PBB's, a toxic flame retardant for plastics that is suspected to be a carcinogen. An EPA preliminary survey last year found residues of PBB's in human hair, fish, plants, soil, and water near the White Chemical Co. in Bayonne, N.J. and the Hexcel Corp. in Sayreville, N.J. Both companies voluntarily stopped production of PBB's last March and now manufacture a substitute compound, which EPA is studying for health effects. A follow-up survey later found only trace amounts of PBB's in the soil and water samples from around the plants. EPA and the N.J. Department of Environmental Protection have set zero discharge limits for PBB's for the plants to ensure that the compound will not be manufactured until a control technology is developed to keep it out of the environment.

Ocean Dumping

Six industries in Region 2 have received interim and special permits to transport and dispose of wastes at two ocean sites. The Regional Office also issued interim permit extensions to 33 New York and New Jersey municipalities. The companies all held previously effective permits from 1976, and all but one are on compliance schedules to phase out ocean dumping on or before Decem-

ber 31, 1978. Employees of the Dupont Grassielli Plant are meeting with EPA technical staff to study alternative treatment processes for its plant in Linden, N.J. Phase-out provisions are also part of the permits for the municipal dumpers. The alternate disposal methods planned for sludge by the communities include landfill disposal, surface land application as a soil conditioner, incineration, and burning with other wastes to produce energy.

3 REGION

Enforcement Authority Delegated

Region 3 has delegated authority to the State of Delaware to enforce air pollution standards for several categories of new stationary sources and for some hazardous air pollutants under the Clean Air Act. The State will be responsible for standards of performance for new stationary sources for fossil-fuel fired steam generators, incinerators, nitric acid plants, asphalt-concrete plants, storage vessels for petroleum liquids, and sewage treatment plants. The State will also be responsible for hazardous air pollutant standards for asbestos, beryllium, and mercury. Jack J. Schramm, Regional Administrator, said that the delegation could never have been achieved without the cooperation of Governor Pierre Dupont and Austin P. Olney, Secretary of Delaware's Department of Natural Resources and Environmental Control.

Aluminum Plant Expansion Approved
Region 3 has approved the Eastalco Aluminum Company's application to construct a new production unit and modify the existing facilities at its aluminum reduction plant in Frederick County, Md. Administrator Jack J. Schramm said that the approval was based solely on the requirements of the prevention of significant deterioration program, which applies only to the control of sulfur dioxide and particulates. He added that EPA considered carefully all public comments about fluoride emissions from the plant before making the decision. The company is required to use best available control technology for particulates and sulfur dioxide. Eastalco is also required to have a preventive maintenance and corrective action program for its air pollution control systems. This includes monitoring of stack emissions to keep a constant check on particles and fluoride emissions.

4 REGION

Toxic Spill

The Ohio River has become an environmental trouble spot for Region 4, especially the stretch between Cincinnati and Louisville. Recently a train derailment spilled four tank cars of acrylonitrile, a suspected carcinogen, from a Chesapeake and Ohio freight train. The spill occurred on the Little Sandy River, an Ohio tributary. Acrylonitrile samples were found in both rivers. Though the concentrations were not toxic, officials were prompted to close down city water intakes in Cincinnati, Ohio, and Maysville, Grayson, and

Greenup, Ky. At Grayson the National Guard trucked in drinking water and citizens melted snow for other uses. Shortly after the spill EPA personnel set up filtering equipment at the wreck to prevent further drainage into the river. EPA was assisted in the response efforts by the Kentucky Department of Natural Resources and Environmental Protection, the Kentucky National Guard, the Dupont Co., and the Ohio River Sanitation Commission.

Water Pollution Down

Region 4 has announced an 81 percent reduction in pollutants discharged into Southeast waters since late 1972, when a water pollution program was implemented. The findings are based on a study by the staff administering the National Pollutant Discharge Elimination System. The study measured levels of suspended solids and the amount of oxygen required to break down organic matter, which encompass the majority of pollutants. Under the NPDES system the discharges are measured regularly by the permit holder and reported to EPA. The study compared 1978 point source levels to those reported when the firms first applied for permits. Non-point sources such as construction and farm runoff were not included in the study.

5 REGION

Sulphur Dioxide Standard Upheld

A Federal appeals court has upheld the sulphur dioxide control standards for industrial discharges in Ohio set by Region 5. The petition, which was brought by 32 companies,

criticized EPA's use of a formula that considers the capacity of each plant in the State on a smokestack-by-smokestack basis and assumes that all plants operate at full capacity round the clock. The high sulphur content of coal mined in the State could mean that utilities and large industries would have to install smokestack filters or scrubbers in order to meet the standards. In a unanimous decision the 6th U.S. Circuit Court of Appeals ruled that EPA's formula for setting the emission standard was a rational choice within the Agency's discretion.

New Laboratory Opens

EPA Administrator Douglas M. Costle and Region 5 Administrator George R. Alexander cut the ribbons at dedication ceremonies for a new \$3-million environmental testing laboratory in Chicago recently. The new laboratory, to be called the Central Regional Laboratory, will be run by Region 5. It has a broad capability to make physical, chemical, and biological analyses and evaluations on air, water, and solid samples from diverse sources.



Sewage Plants Cited

Regional Administrator Adlene Harrison has issued administrative orders to ensure that Jefferson Parish, La., officials reduce pollution discharges into Louisiana streams and rivers by correcting operation and maintenance deficiencies at eight of the Parish's major wastewater treatment facilities, as required by their Federal discharge

permits. The most serious deficiencies concern failure to identify and require pre-treatment of industrial wastes contributed to the plants, discharge of pollutants beyond the limits set in the permits, inadequate operation and maintenance of the facilities, improper monitoring of plant discharges and improper disposal of sludge produced in the operation of the plants. Other deficiencies reported for some of the plants included improper bypassing, failure to file required reports with EPA, and failure to control solids and foaming. The deficiencies were recorded during plant inspections and Parish reports to EPA from 1974 to the present.

Public Hearings

EPA held two public hearings in New Orleans last month. The first centered on EPA's proposed regulations to allow States to develop programs for the management of hazardous wastes under the Resource Conservation and Recovery Act. The second solicited comments on proposed regulations to establish maximum contaminant levels for organic pollutants in drinking water under the Safe Drinking Water Act.



Learning Session

To improve communication between EPA and the farm community, Region 7 held a "listen and learn" session March 28 and 29. Agency staff members met with the four State public information officers from the Region and the State extension information specialists to develop optimum means of

reaching the agricultural constituency. Dr. Robert C. Fite, director of the Oklahoma State University Extension Service, addressed the session on the transfer of environmental information through the cooperative extension service. Dr. Fite directs an EPA-funded research project that is studying ways to improve information dissemination.



Action on Colstrip

Region 8 hopes to reach a final decision by mid-April on the application for an environmental permit for the construction of the third and fourth units of the power plant at Colstrip, Mont. Regional Administrator Alan R. Merson said that EPA processed the application under the old rules for preventing significant deterioration of air quality because the application process and comment period was complete before the March 1 deadline set by the Agency under the 1977 Clean Air Act Amendments. However, the Agency did extend the deadline for comments until March 18. According to Merson, "The Colstrip, Northern Cheyenne situation is unique and of such public concern that we feel it would be unfair to penalize Montana Power by changing the rules in mid-stream and adding unreasonable delays to the permit process. The Northern Cheyenne feel insufficient time was provided to review and comment on the many issues involved here. We are re-opening the comment period to consider their additional comments." Merson met with Northern Cheyenne tribal

leaders and with power company officials. In response to a request from the tribe for an independent review of the Region 8 analysis of Colstrip 3 and 4 Merson has called on EPA's research facility in North Carolina for an evaluation.



New Activities

Region 9 staffer Judy Swenson appeared on the NBC "Today Show" in a videotaped segment prepared in recognition of Poison Prevention Week, March 20-24. She demonstrated to a householder the correct methods for storing and handling poisons safely.

The Regional Office in San Francisco has begun an office paper recycling program, called "Use It Again, Sam," which entails collecting used letterhead and white bond copy paper, computer printouts, tab cards, memoranda, and other untinted paper for reuse. The paper is set aside in special containers on staff desks. Regular pickups of this paper are brought to a central collection area. When sufficient quantity is accumulated the Agency turns it over to a recycling company for reformulation.

Copy Lines, a new feature service, has mailed a sample story entitled "Why World Environment Day Is Different," to 650 daily and weekly newspapers, magazines, and newsletters in Region 9. A World Environment Day Spring Festival in conjunction with environmental groups is planned for June 3 at Golden Gate National Recreational Area.



Aquifer Protected

Region 10 has given "sole source" designation to the Spokane Valley-Rathdrum Prairie Aquifer, the underground river that provides drinking water for 338,000 people on both sides of the Washington-Idaho border. The sole source declaration means that construction projects receiving Federal financial assistance that have the potential for polluting the aquifer will be subject to special EPA review to make sure such contamination does not occur. "Protecting the Nation's drinking water supplies is one of EPA's most vital public health programs," said Donald P. Dubois, Region 9 Administrator. "Designation of the aquifer will provide a systematic review process by which public health problems can be anticipated before they occur." The designation was spurred by a petition from the Idaho Coalition for Shorelands Preservation, the Spokane Audubon Society, the Spokane Valley Citizens Committee, and the Spokane Sierra Club. Data received by EPA through public hearings supports the contention of the petitioners that contamination of the aquifer would be a significant hazard to public health. Projects that carry a potential for contamination are highway construction, multi-unit housing development, and municipal sewage treatment facilities. EPA is holding meetings to acquaint local residents with the project review procedures that will be used to protect the water in the aquifer.

A black and white photograph showing a large, overflowing pile of garbage. In the upper left, a large, dark, heavy-duty trash can is tipped over, spilling its contents. The trash consists of various items, including crumpled paper, cardboard boxes, and other debris. To the right of the main pile, a dark rectangular sign is partially visible, with the words "HELP KEEP YOUR BROUGH CLEAN" printed on it in a light color. The foreground is dominated by a dense, chaotic layer of trash and litter.

Will We Be Remembered Because of Our Wastes?

By Thomas L. Kimball

When archaeologists want to learn about a civilization one of their most lucrative sources is the garbage dump. What the ancient Egyptians, Mayans, the inhabitants of Western Africa and the citizens of Angkor Wat threw away is even more revealing about life in those societies than the remnants of their buildings and inscriptions on their tombs. Future archaeologists will have a field day with mid-twentieth century America.

First, they will certainly have an abundance of resources for their work. We are now throwing away municipal garbage at a rate of 150 million tons per year, and EPA's own Office of Solid Waste has predicted we will produce 300 million tons per year by the year 2,000. We are making archaeologists work easy by centralizing much of our garbage into disposal sites serving entire communities. In fact, sanitary landfills, with their progressive cell structure, will simplify even further the archaeologists' process of calculating the "layers of civilizations." Still, lest we make that process too simple, the continued proliferation of promiscuous open dumps that dot our countryside will provide them with challenging surprise discoveries.

Although today's archaeologists use sophisticated carbon-

dating and other processes in their work, their future counterparts may not need such tools for much of our garbage. Large portions of it will still be intact because it did not decompose naturally. Other portions, while having deteriorated, will reveal some equally fascinating things about us.

Obviously we will emerge as a technologically advanced society. However, some of our advances may prove misleading, in fact, contradictory to other records which survive us. How will the future investigators reconcile the reports of our oil shortages with the abundance of petroleum-based items in our garbage, much of it disposable packaging?

Perhaps the most revealing thing about our garbage will be our obvious lack of regard for resources. Found will be enormous quantities of materials of a reusable or recoverable nature which our culture saw fit to discard. How will a resources-precious future evaluate such findings and what role will such evaluations play in their estimate of their ancestors?

There is something that may save us from such future archaeological investigation. Our children and grandchildren may have to disturb the graves of our waste in search of essential resources for their society. In desperation, they may turn their drills and other mining equipment on our dumps and landfills. Unfortunately, they may find this unsavory process made dangerous due to the hazardous nature of much of what we threw away. Whether they have to mine them or not, the disposal sites we located and operated improperly may grab their attention anyway by con-



taminating their water supplies or otherwise impacting their environment.

As the Nation's largest conservation organization, the National Wildlife Federation is striving to see that our legacy will not be so negative. We are pleased to be working in concert with the Environmental Protection Agency in this effort. Together we can change our wasteful society into a society that minimizes its wastes, recovers the resources from the wastes it produces and properly disposes of what garbage still remains. We don't want to be remembered as the Throwaway Civilization. □

Thomas L. Kimball is Executive Vice President of the 3.5-million member National Wildlife Federation.

Alternative Waste Disposal

An interview with Abby Rockefeller, an environmentalist and holder of the U.S. franchise for the Swedish Clivus Multrum, a composting toilet system.



Do we really need flush toilets in our society? Is it wise to discharge our wastes into waterways? Can human wastes be used as manure to help grow crops? Are centralized waste treatment systems necessary? Abby Rockefeller, a member of a famous American family who would rather be known for her commitment to environmentalism, offers opinions on these and other subjects in the following interview with John Boykin of EPA's Public Awareness Office.

What do you think of conventional systems of treating sewage?

We feel that central collection and treatment of sewage wastes is a dead end and cause of unending trouble. First, you don't really clean the waste water. Second, the better you clean the water the worse the sludge problem becomes. Our interest is to keep organic materials, heavy metals, and poisons out of the waterways and ground water.

How do you favor handling the problem?

We favor using a system that can handle both the household kitchen waste and the toilet waste. These wastes can be kept separate from the wash water. We want to press EPA to take more seriously the principle of separated treatment of black water (toilet waste) and gray water (bath and laundry water waste). If you don't use water for transportation of toilet waste you can save as much as 40 percent of your total water demand. Also treatment of the gray water should be less difficult because it is not likely to be dangerous in the same way that black water sometimes is.

Why did we begin using central waste treatment systems?

One of the reasons we have gone in this country to central treatment so widely is that septic tanks have been polluters of ground water. People turned to sewers because septic tanks caused contamination of ground water. But sewers have caused plenty of new problems which were not anticipated. For example, in many areas instead of polluting the ground water you deplete the ground water to transport the wastes. Furthermore, central treatment produces sludge. This appears to have been a great surprise and no one really knows what to do with sludge. There are efforts

now to use it on land, but we feel strongly that this is not the way to go for the future. Land application may be the best way to use sludge now, but it is not a good idea for the long run. The problem is that a sewer is an invitation, as everyone knows, to put poisons into the water and that cannot go on. Once you have sewers you are bound to have a problem, either because of the quality of the water or from sludge.

What do you believe Government should be doing in this area?

We need research in this field. There has to be serious work studying gray water and its characteristics, its constituents and the proper way to treat it. Also we feel that the principle of composting human waste should be given a much closer look by EPA. We feel it has many advantages.

What is the treatment approach you favor?

On-site decomposition. We believe that the toilet and kitchen wastes can be decomposed aerobically (using oxygen). You can also decompose them anaerobically, (with no oxygen), but that's a more complicated process and takes much more maintenance. Whether you do it aerobically or anaerobically are questions that have to do with the size of the structure you are dealing with. If it's a large building in a city, you might want to go to anaerobic digestion and have a person who is responsible supervise the decomposition.

Where did the name Clivus Multrum for your composting toilet come from?

The name is a combination of Latin and Swedish. Clivus means inclining and Multrum means, in Swedish, composting room. The system consists of a container that sits beneath the floor that is attached to the toilet or toilets and to the garbage chute. The tank is on an angle so that there is a rate of sliding corresponding to the rate of decomposition, both very slow. So the materials collected in this tank move very slowly down the inclined surface, and

decompose at the same time. Eventually after three to five years you can remove the finished product—a clean, odorless compost for lawn or garden.

What would it cost a homeowner to buy a Clivus Multrum and install it?

The whole system without installation is \$1,685, which would include all the parts such as the treatment chamber container, ventilation system and the necessary piping. Installation costs vary depending on whether the system is being installed in a new building or an old structure. If the system is installed when a new building is being constructed the cost of installation would be next to nothing.

Are there odor problems with your system?

There is an odor in the container which must be carried away. We think using a small fan is a good idea. I had a composting toilet in my house for two years without a fan and it was excellent. However, I have put a fan in because some days in the summer in hot weather and low air pressure there can be a problem.

How much energy does this system use?

No energy is used except for the small fan. It is the metabolic energy in the waste materials that does all the conversion work. The only maintenance work is the removal of a small portion of the finished compost that is produced.

Do you see yourself as an environmentalist or a business person?

I started out with this as an environmentalist and my environmental and business interests have merged. My interest in it was primarily environmental, but I am unavoidably involved in the business aspect.

What other environmental issues are you involved in?

I am interested in solid waste treatment and the nuclear power question which also has its waste problems. I oppose the resource recovery approach as much as I oppose the centralized collection of treatment of sewage waste. The idea that you should allow mixing or promote mixing and then try to get the BTU's (the heating value) back from these wastes is most unfortunate.

If you centralize sewage and solid waste treatment you create a hopeless waste. We make the solid wastes valueless by mixing them because they are so repulsive that they have no value to anybody. You can't make anybody interested in separating food and cans and glass bottles and wastepaper that are all mixed together. Once they're mixed, it costs too much to separate them.

What should be done with these wastes?

It's easy for the home owner to keep them separated from the start. The same principle also applies to sewage waste.

Are there legal problems in some States that could prevent installation of waterless toilets?

Many State health codes require a flush toilet. This country had just come to the point where it had finally got every State to require flush toilets, roughly speaking. And now here we come along saying we should take that provision out. That's hard for a lot of people to take. The flush toilet has been regarded as a symbol of progress.

Are there any States that permit waterless toilets?

Some States have fully approved this approach. Full approval means not only recognition of the benefits of putting a composting toilet in the house but also allowing for the limited treatment appropriate for gray water. We need a serious in-

vestigation of gray water treatment so you don't require people to have two complete systems, that is a septic tank and leaching field as well as a composting toilet.

How do you respond to charges that the composting toilet is just an indoor outhouse?

We reject this. The outhouse was environmentally and health wise not a very good system. It was understandable that people wanted to get away from this, and water seemed to them a wonderful way to solve the problem. In outhouses the wastes were just allowed to go into the ground or into the water table. The wastes weren't recovered for use and the outhouse was not good technology.

How many years has the Clivus Multrum been used in Sweden?

It has been used by a few people for 35 years, and by more than a few people for about 15 years.

What is the degree of acceptance throughout the country?

The Swedish National Health Department has completely approved it. They have had it tested for years and years and it is considered to be a reliable method of achieving a safe product. However, it has not been used very widely because Sweden preceded the United States in building a massive national sewer system. So there was virtually no money left for on-site treatment during this period. They have found now in Sweden that they don't know what to do with sludge. The farmers will not take it.

The farmers found the sludge had high levels of cadmium and other toxic materials. Although concerted efforts were made in Sweden to control the toxic materials in industrial discharges, they found out that this did not solve the problem. Metallic and toxic wastes from laboratories, homes, and drug stores contaminated the sludge.

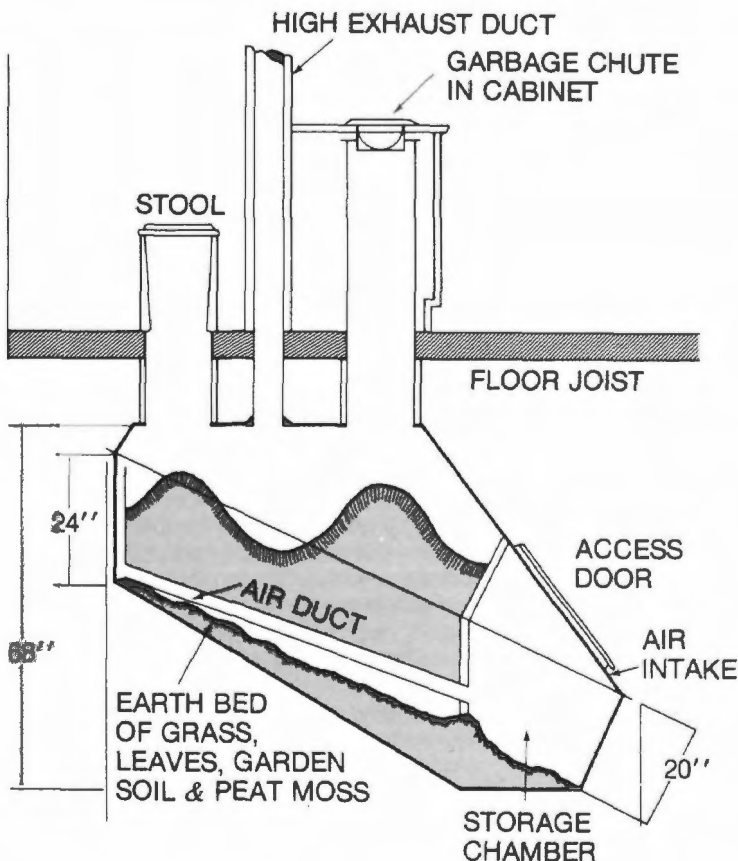
How many Clivus Multrum systems have been installed?

About 800 have been installed in the United States over a period of about three years.

How did you first hear about the Clivus Multrum?

I read about this particular system in Organic Gardening and Farming Magazine. They had an article describing it and I happened to be interested in trying to construct something of the sort myself. I was living at the time in New Hampshire and the flush toilet seemed absurd in a rural area. So this was the beginning.

I knew the value of composting. I was told that animal manure was gold, but human manure was bad stuff. I just couldn't believe that. I think it gradually occurred to me, especially when I read about this system, that human waste is as valuable as what we eat. □



On the Threshold of a New Environmental Era

By Barbara Blum
*Deputy Administrator
U.S. Environmental Protection Agency*

Prompted by Earth Day celebrations in 1970, we have come to realize that our Nation and indeed the world has very seriously neglected environmental values since the dawn of the Industrial Revolution.

It was only a few years ago that we were all terribly certain that through the random use of science and technology—through automation, through nuclear power, and through chemistry—we *were* moving automatically toward a better life for everyone. It was not until 1970 that any appreciable number of us really understood that in the process of achieving wondrous advances in science, technology, and industrial growth, we had inadvertently created a complex fabric of interwoven by-product problems potentially capable of smothering all our accomplishments.

We discovered that society has to make difficult choices that require careful measurement of public benefit against public risk—that raise difficult questions about conflicting private and public rights. We realized for the first time that we make decisions every day and every year in the social and economic spheres of our lives on the basis of scientific data which at worst are non-existent and at best, by the very nature of science, are usually incomplete.

In an unprecedented effort to stem the tide of environmental ills that we had so long neglected, Congress passed the National Environmental Policy Act, which set forth the remarkable notion that man and nature must exist in productive harmony. The few environmental control laws which already existed were greatly strengthened and a variety of new environmental and related consumer protection acts followed. State and local governments greatly improved their environmental laws

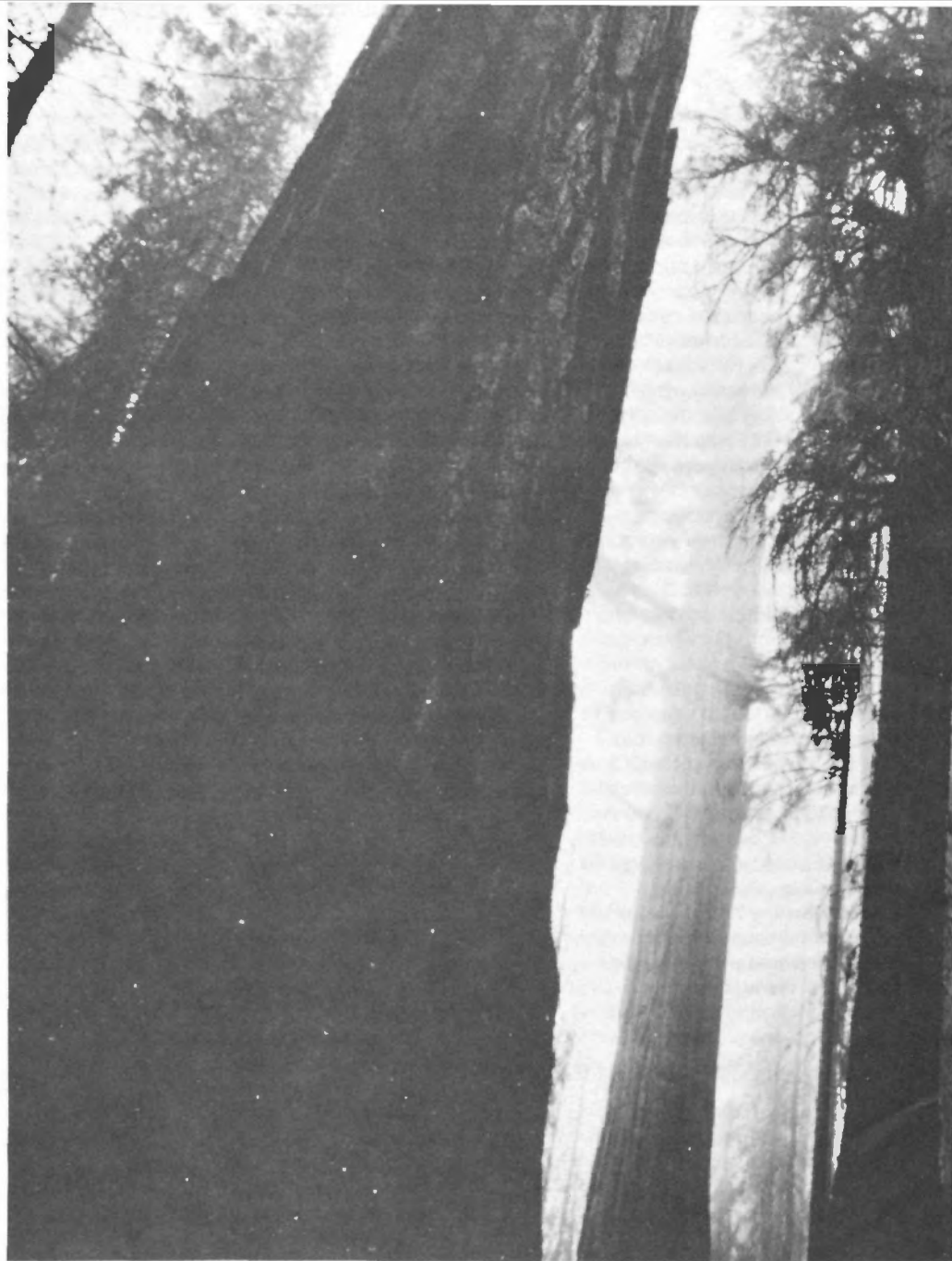
and regulations and there began a growing acceptance of corporate responsibility with regard to environmental and related consumer matters.

The year 1970, then, in an important sense, marked the beginning of what can be called a worldwide revolution in environmental awareness, understanding, *and* action.

Perhaps now in 1978, aware of how complicated and difficult environmental reform is and having succeeded in erecting new institutional structures to curb the excesses of the past, we may flinch at use of the term "revolution." In our newly acquired sophistication we may even regard Earth Day celebrations as something less than stylish. If so, I submit that we must *not* deny the roots of our original passionate awareness

and concern. They are just as valid now when so many strive to be cool about environmental issues as they were at the beginning of this decade when we first discovered them.

Since then the law profession has assumed a more prominent role in the environmental field with each year that has passed. That is not surprising. After all, it is the profession that attempts to find the just and the right amid a confusing and complex array of conflicting claims, facts, ideas, and attitudes and to integrate the dictates of science into the social and cultural fabric of society. We have also witnessed an increasing demand among citizens for the right to play a part in the decisions which determine the kind of life and the kind of world their children will live in. The people have been saying that the science, industry, and technology that have given us affluence in abundance beyond our ancestors' wildest dreams are surely equal to the task of deal-





ing with the unwelcome by-product problems that have been created in the process. They have been saying that the mechanisms of government—designed perhaps for an earlier and simpler time—must be made responsive to the needs of contemporary life.

It is fashionable in some quarters to suggest that in our zeal to erase the environmental mistakes of the past, our society has over-regulated the sources of pollution and that we must now back off and let nature take its course. Those who hold this view miss the point entirely. It is not nature but man who has been off course.

Historically, we have extracted, processed, and consumed resources as if the supplies were endless and we have discarded the residual so-called “wastes” into the air

and water and onto the land as if the environment's capacity for safely absorbing them were infinite. The legislation we now have to cope with the residues must be employed to the full. What we have learned about the complexity and pervasive nature of pollution does not indicate that we should back off. It indicates, instead, that placing stoppers on air-polluting stacks and water-polluting outfall pipes is only part of what is needed to save us from burgeoning environmental problems we have neglected during two centuries of technological and economic achievement.

Environmental legislation passed in the past few years, as well as the most recent amendments to the original air and water laws, asks that we now get to the root of environmental and related public health problems without diminishing our efforts to prune the most noxious branches. We are on the threshold of accepting the fact that the *manner* in which our society conducts

its private and its public business has far-reaching health, economic, and social implications and bears fundamentally on the essential integrity of ecological systems upon which we depend for life itself. We are beginning to understand that how we do things is as important as what we do. We are beginning to acknowledge that it is environmental and public health folly to continue to think that we can deal adequately with toxic substances after they have been produced, and economic folly to continue to consign valuable natural resources to the trash heap of environmental mismanagement while the world's supplies continue to dwindle.

We are on the threshold of a new era in environmental protection—an era in which the after-the-fact economic and environmental folly that has too often characterized our handling of environmental problems until now must give way to an emerging imperative for before-the-fact resource management and public health protection. The times call for new patterns of interaction among all levels of government, the assumption of key responsibilities by industry, and for meaningful public awareness and participation in all the major activities mandated by environmental legislation.

The times call also for an acceptance of the truth that machines are as much a part of our lives as muscles and mountains. We can no more do away with technology than we can let it do us in. We have to learn to live with it—to use it to shape a world that will sustain us without, at the same time, threatening life in subtle and insidious ways.

To do so we have no choice but to make the best estimates we can on how much pollution or crowding or noise or chemical contamination is permissible, or tolerable, for human health and well-being.

The single major piece of environmental legislation—what I have called a new era in environmental protection—is the Toxic Substances Control Act of 1976. This Act, clearly and for the first time, fully and directly acknowledges that cleaning up environmental residues after they have been produced is only a part of the job that lies before us. The other, and in the long run the most difficult part, is to prevent harmful residues in the first place. Under the Toxic Substances Control Act, EPA is required to insure the safe manufacture, use, and distribution of potentially dangerous chemicals. TSCA is the beginning of a long, difficult journey during which our society will learn how to prevent the introduction of harmful substances into our air, our water, our land, and our bodies. I hope it does not take too long but it will be difficult in any case, for we must do it with-

out sacrificing the enormous benefits that science and chemistry have given us and without jeopardizing the creative diversity of decision-making which has characterized and enriched our open society.

When we have gone farther down the road toward the farsighted use of science and technology, the proliferation of after-the-fact regulations should begin to diminish—and none too soon.

The first year that the Federal Register was published back in 1936, it consisted of 2,411 pages. By 1967 it had grown to 21,087 pages, and a mere ten years later, by 1977, had reached 64,000 pages. Expressing a popular sentiment about this, President Carter said in his State Of The Union Message, "The American people are still sick and tired of Federal paperwork and red tape."

EPA takes very seriously the public's and the President's desire that we "chop down the thicket of unnecessary regulations and turn the gobbledygook of Federal regulations into plain English." One measure we are taking to lighten the burden on those who must comply with Federal regulations is a new cooperative interagency approach under the Toxic Substances Control Act.

EPA, the Consumer Product Safety Commission, the Food and Drug Administration, and the Occupational Safety and Health Administration all focus on various aspects of the toxic substances issue. Obviously, the problems of toxic substances, whether in consumer products, in drugs, in the work place, or in the environment, are in many ways similar.

Although each Agency administers different statutes and has differing regulatory objectives, we have many common goals, and functions under TSCA. We all regulate chemicals and other toxic substances and the industries that produce them. We all collect and store large amounts of data on chemicals, much of which is similar. We all do risk assessments on chemicals, and develop guidelines and standards, and we all have enforcement staffs to ensure that our regulations are carried out.

We have recently set up a structure for real interagency cooperation. Through it we intend to make headway in eliminating overlapping or inconsistent regulatory actions and unnecessary duplication of paperwork. We will develop compatible testing standards and toxicity guidelines. We will develop a common approach to the problem of assessing health risks posed by hazardous chemicals, as well as coordinated development of standards and regulations, whenever appropriate. We will be able to cut down on paperwork and time in review. We will plan our research efforts together to ensure that the best use of our collective research capacity is being made,

to reduce overlap and prevent those "toxic chemical-of-the-week" crises, which are so destructive to industry and regulators alike. And we will coordinate our public information activities, in recognition of our joint responsibility to inform and alert the public to the hazards of health and safety we find throughout the environment.

In this cooperative effort, we are striving toward a more consistent regulatory policy, better sharing of information and resources, a more coherent approach to the whole spectrum of problems confronting us, and the balancing of risks and benefits which must lead ultimately to improved protection



of public health and safety. I am encouraged by this cooperation. I hope that we will be able to learn a great deal from each other in this effort, not just about toxic substances, but about improved approaches to regulation, research, and enforcement.

To chop down the thicket throughout EPA, we recently announced a comprehensive 40-point regulatory reform program. Some of the major initiatives we propose include:

- Seriously studying a number of economic incentives that could be used to encourage and speed up compliance while removing the competitive advantages that delays can offer. The incentives include a mix of carrots and sticks—improvements in Federal procurement practices, civil noncompliance penalties, and special exemptions for technological innovation.

- Strengthening participation by State and local officials and the general public in agency decision-making. We are inviting participation in the Agency work groups that develop regulations. Three to five State environmental agencies will also share in our next zero-base budget cycle on a test basis. We are jointly looking for ways to reduce both the number of individual permits required and the time it takes to obtain them.

- Revising our adjudicatory procedures to create a better fit to the nature of the decision without endangering due process rights. The system now in use is modeled after formal court proceedings and has proved to be too lengthy and expensive for all concerned.

- Finding a functional method of including a "sunset policy" for reporting provisions in all new regulations. Under such a policy, unless specifically prohibited by law, regulations requiring record-keeping or reporting will automatically be reviewed on a five-year cycle. This will allow a systematic rooting out of duplicate or avoidable information requests.

There are many others, of course, including a very serious effort to ensure that our regulations are written in plain English. We are not simply locking a group of our lawyers in a room with a bad regulation and hiding the key until they come out with a good one. We are establishing a program and a structure throughout the Agency to make it as difficult as possible to produce regulations which are not clearly and lucidly written.

Some of the criticism of the way regulations are written is not entirely justified. There are always competing considerations in drafting a regulation. While it is essential to write clear, concise, straightforward regulations and to avoid jargon, it is also necessary to prevent unnecessary litigation and to provide for those contingencies that might be challenged. There is an unavoidable tension between clarity and coverage, between innovation and security. We are determined to find the proper point on the spectrum in full awareness that a rule book cannot be used as a substitute for common-sense judgement. At the very least, we hope that our program will prevent us from resembling the lawyer, about whom Abraham Lincoln said, "I never met a man who could compress so many words into such a small idea."

We believe that the EPA regulatory package, all 40 initiatives, are very much in harmony with the President's goal of making the government workable. It will open this Agency still further to public participation—and public accountability. The principle of allowing the greatest possible degree of flexibility in environmental problem-solving is the cornerstone of our efforts to reshape EPA's regulatory system.

As I mentioned earlier, however, the problem of how to live creatively and freely and responsibly with the great power for good or for ill that science and technology have given us is the basic challenge of this era and it confronts our whole society. Meeting this challenge will require a strong creative effort on the part of every segment of our Nation. □



The Need for Public Participation

Continued from page 3

mize their disruptive effects. We avoid the spectacular delays that result when ill-conceived programs are put into effect without a chance for adequate public comment.

Let me give you an illustration of how a public participation system that is well-designed can work.

In setting out to write rules on hazardous waste, we decided it didn't make sense to wait until we actually put pen to paper before seeking outside viewpoints. Our first move was to hold two-day public meetings in each of EPA's ten regions to talk about what strategy we should adopt for implementing the Resource Conservation and Recovery Act as a whole. Then came a series of about 80 smaller workshops on the hazardous waste segment of it. Thereafter, as meetings of various kinds continued, the regulations were drafted and sent out to a diverse mailing list we had developed. In fact, throughout the process extensive efforts were made to keep anyone who might have an interest in the subject informed. Besides the direct contacts by mail, we also put notices in trade journals, and announcements in newspapers in areas where the meetings were being held.

Now we are close to where public participation often began in the past—the publication of draft regulations in the *Federal Register*. We went through this whole process without significant slippage in our timetable. We're a little bit behind, but that's because of internal delays.

Another serious difficulty in trying to open up the decision-making process is illustrated by this excerpt from a draft regulation on pesticides:

"The octanol/water partition coefficient can be determined simply, quickly, and inexpensively with good reproducibility, and is now regularly determined for pesticide chemicals as they enter the market. Because it is indicative of lipid solubility, it will predict semi-qualitatively the potential for bio-accumulation in the lipids of animals for the particular pesticide under consideration. It will not do the same for metabolites. . ."

The average person would be hard pressed to make

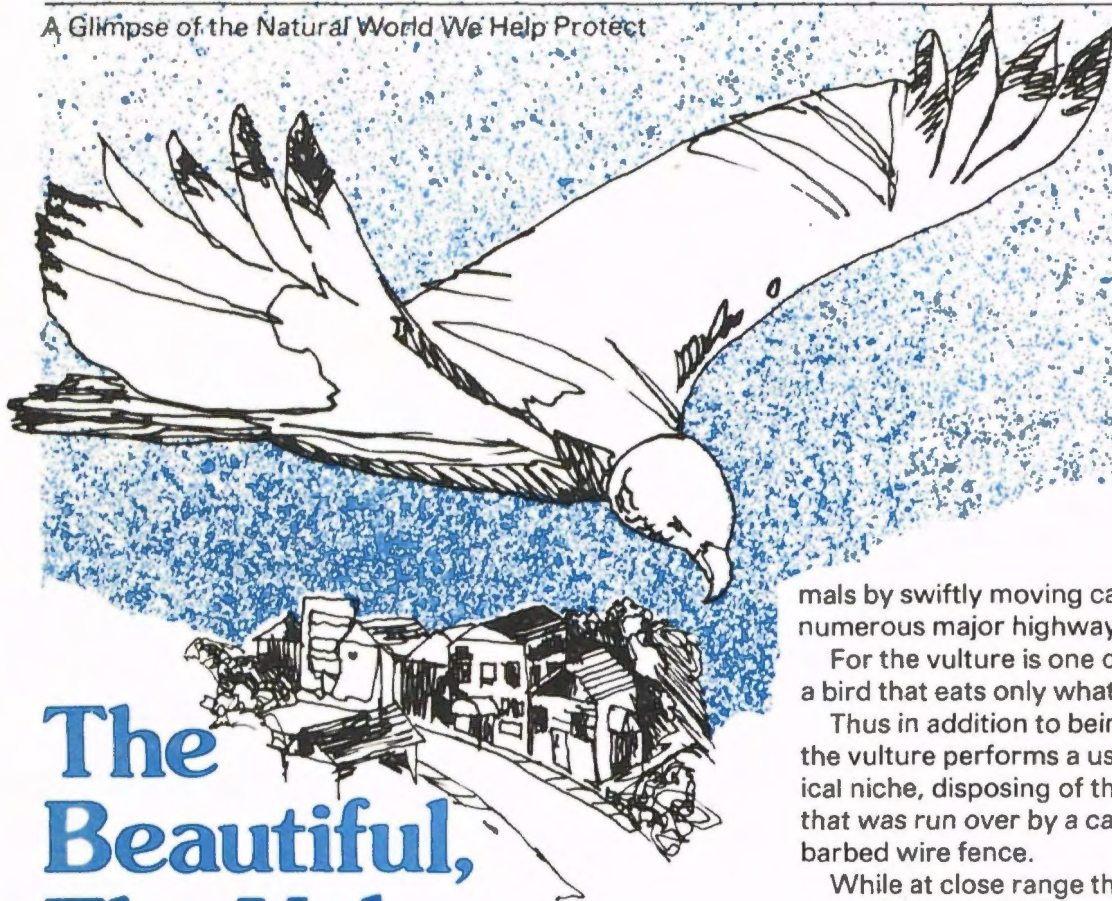
sense of that. I have a little trouble with it myself. I offer it as an example of the technical complexity of many of the issues we deal with. This does not mean that lay people can't be brought into the decision-making process because the issues are beyond their comprehension. That has been the argument offered by too many public officials who do not want to involve the public. I believe it's a fraudulent one. It does mean that we have to find ways to present the choices clearly to people without a technical background.

We are already taking some steps to accomplish this. For one thing, we're trying to remind any EPA employees who might have forgotten that the English language is supposed to function as a bridge, not a wall. We're particularly concerned that our rules and guidelines be written clearly and concisely. In addition, we've awarded grants to organizations so they can sponsor educational sessions on environmental issues.

Another problem is what to do when our actions will have broad public impact but most people aren't aware of it. Should we assume at some point that there's no way to get our message through? Or should we keep trying in the hope that a meaningful proportion of the citizens we reach will then get involved?

There's an old metaphor about public involvement which says that the average citizen won't get involved until the bulldozer is outside his front door. I believe that if the process has gotten anywhere near the bulldozer stage before a citizen speaks up, it indicates a failure on the part of government, not the citizen.

EPA is getting ready to test whether I'm right. We're going to assume that when we are convinced a proposed action will have broad impact, we can persuade a large percentage of those likely to be affected that this is the case. We are betting that a significant segment of them will respond. This is not to say that we expect our meetings and hearings to draw like the Superbowl. I believe we can bring about a quantum jump in public involvement. It's too early yet to know whether my judgment is correct. But I can assure you that we are serious. I think we can devise a system that can succeed. And if we do, we will have gone a long way toward bridging the dangerous gap that has grown up between the government and its citizens. □



The Beautiful, The Ugly, And The Useful

They often appear silently in the sky just before twilight at the Harpers Ferry gap in the Blue Ridge Mountains. Sometimes in early spring as many as 200 of these turkey vultures wheel in formation above the pass where the Potomac and the Shenandoah Rivers converge to begin an often turbulent joint journey down to Washington.

At first sight these large birds appear ominously like enemy bombers. Yet as you watch their flawless aerial maneuvers your feeling of apprehension changes to admiration.

These are surely some of the ugliest of birds yet they are magnificent sailers of the skies.

They can float overhead stiff-winged as if painted on a cloud. Or they can swoop by in graceful circles, riding rising air currents without ever beating their vast wings. While a crow lumbers by with labored flapping and loud caws the vultures soar serenely overhead.

Vultures have roosted near Harpers Ferry for many years because the mountain gap offers cliffs for safe nesting places, thermal updrafts, thick woods for roosting and a plentiful supply of fresh water.

Also of great importance is the large amount of carrion provided primarily because of the slaughter of wild ani-

mals by swiftly moving cars and trucks on the area's numerous major highways.

For the vulture is one of nature's chief scavengers, a bird that eats only what is already dead.

Thus in addition to being a thing of beauty in the air, the vulture performs a useful and vital task in its ecological niche, disposing of the dead, whether it be a skunk that was run over by a car or a deer that strangled in a barbed wire fence.

While at close range the vulture with its turkey-like bald red head is ugly, there is a utilitarian reason for the absence of head feathers.

The turkey vulture can insert its naked head into a carcass to feed without contaminating its feathers with disease-infested carrion blood. Incidentally, scientists report that other members of the vulture family, in foreign countries, with feathered heads avoid entering a carcass.

While the turkey vulture is a fascinating creature, it is ignored by most people. A flock of turkey vultures has roosted in Rock Creek Park in Washington for many years yet few residents of the Capital ever notice them.

Louis Halle, the former State Department official and gifted naturalist, noted in his classic book, "Spring in Washington," that he had observed as many as 100 vultures circling low over Connecticut Avenue when it was crowded with people and yet none took notice. But, added Halle, many of these people will go to the zoo to gaze upon the caged turkey vultures.

Halle adds that if a flight of vultures or herons is pointed out to people and if the newspapers, for example, "announce that tonight there will be a flight of herons over the city: the streets and housetops will be thronged long before dusk with citizens scanning the sky."

This latent curiosity about nature can be fanned far more easily than an interest in sewage treatment plants or government regulations, however important.

An old salesman's adage urges "selling the sizzle rather than the steak." Stimulating an interest in nature can help lead to an abiding concern for the environment which supports it. -C.D.P.

• *Pearl Harbor is open to the public for swimming, boating, and fishing for the first time since World War II. The discharge of raw sewage into the harbor has been completely halted.*

• *Fish have returned to western Connecticut's Naugatuck River, where no aquatic life could survive in the 1950's. Thanks to cleanup efforts by cities and industry, smallmouth bass, bluegills, and other fish now are flourishing there.*

• *Most urban regions will achieve the air standard for carbon monoxide in 1985, and by 1990 the 16 cities with the worst problems should all meet the standard.*

• *About 678,000 people were directly employed in pollution abatement in 1974, and the number probably has increased since then because of increased pollution control expenditures.*

Those are some of the encouraging notes in the eighth annual report of the Council on Environmental Quality recently submitted by President Carter to Congress.

"We share a record of solid accomplishment in the environmental area, and we have set out worthwhile plans for the future," declared President Carter in an accompanying message. "We have not yet learned, of course, to balance all our environmental objectives against the other social goals that must concern us. But it is now clear that the American people believe our needs for food, for shelter, and for the necessities as well as the amenities of civilization can be met without continuing the degradation of our planet."

The 445-page report noted that while the quality of air and water is improving, the goal of making the Nation's waters "fishable and swimmable" by 1983 probably cannot be met. In addition, it warned of emerging pollution problems that should receive close study.

One of these problems involves the conversion of numerous oil-burning plants to coal. Some byproducts of coal com-

bustion including carbon dioxide could cause global temperature increases and toxic acid rain harmful to forests, certain fish species, and water quality. The report pointed out that these chemicals are not removed from stack emissions by present scrubber technology.

The report also declared that more study is needed of an apparent relationship between soft drinking water, such as that found in the Southeastern United States, and the incidence of cardiovascular disease including heart attacks and stroke. In the Southwestern United States, where water tends to be hard, "cardiovascular mortality is generally quite low," according to CEQ.

As a measure of the continuing progress in environmental cleanup, the Council forecast that most U.S. cities will be able to bring the five major air pollutants down to acceptable levels within the next dozen years. Particulates and sulfur dioxide in fact have been reduced to the point where very few regions now experience significant violations of the standards for them.

The report also listed 50 U.S. bodies of water that have been "greatly improved" since the 1960's. These include the Savannah River, one of the most important waterways in the Southeastern United States, where all major dischargers on the lower river have built treatment facilities. "Aquatic life is recovering and fish are reappearing in parts of the river where they have not been found in years," the Council noted.

Other bodies of water listed as much improved include portions of the following rivers: the Detroit River in Michigan, the Androscoggin River in Maine, the Mohawk, Buffalo and Susquehanna Rivers in New York, the Willamette in Oregon,

and the Houston Ship Channel.

In the area of solid waste, the report said that the problem of hazardous waste has grown to serious proportions in recent years. It emphasized that the technology for environmentally sound disposal is generally available, although at higher cost than present unsatisfactory methods.

In noise control, the Council noted that the Federal Aviation Agency's new aircraft noise regulations will require all aircraft regardless of production date to meet aircraft noise standards during a phased schedule of eight years.

The report also devoted extensive space to describing the opposing points of view that have emerged between "hard" and "soft" energy policies. The "hard" strategy refers to increasing efforts to develop all present energy sources, with a gradual switch to nuclear power as fossil fuels are exhausted. The "soft" energy strategy would put more emphasis on conservation and renewable, relatively non-polluting sources of energy such as solar power. The Council suggested that the two strategies could be combined to help meet the energy problem.

An interesting sidelight was some critical language the Council had for off-road vehicles, or ORV's. The report quoted a Bureau of Land Management estimate that more than one half of all ORV use on U.S. public lands is on BLM lands and that use by these vehicles in 1972 was estimated at more than 12 million visitor days. The Council declared: "ORV users are a small percentage of the total population, but the resource damage that they cause is out of proportion to their numbers. ORV's have invaded a variety of lands—from deserts and coastal sand dunes

to forested mountains and fertile plant and wildlife habitats.

"In addition to causing plant destruction, soil erosion, and gully, ORV's can adversely affect soil moisture, water quality, and wildlife habitat. Often they conflict with other non-destructive uses. Reclamation is a very difficult and costly task, and natural recovery on some soils is slow."

The report noted that President Carter issued an Executive Order last year requiring agency heads to close portions of public lands to ORV's if they cause or will cause considerable adverse effects on soil, vegetation, or other values.

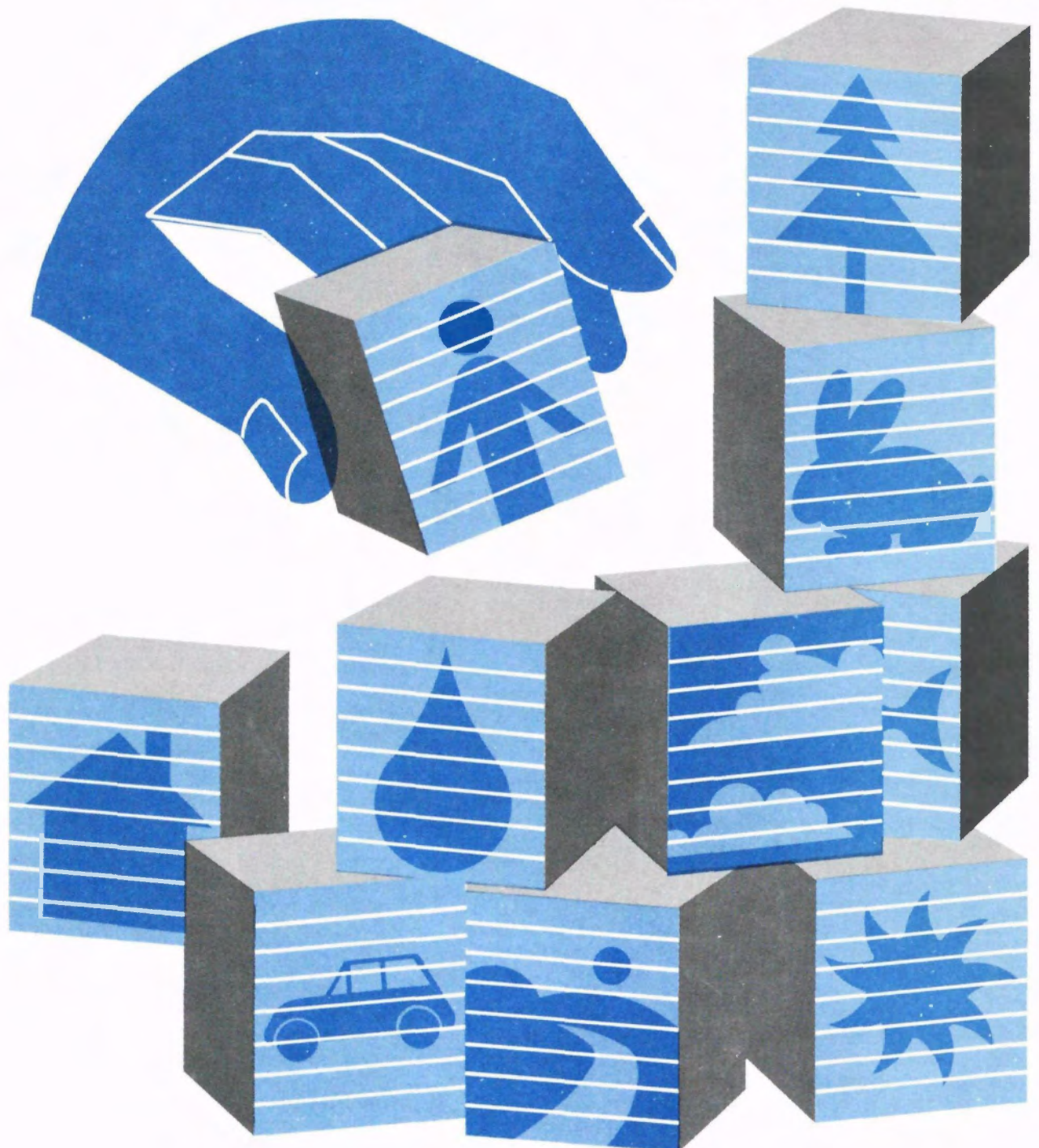
According to CEQ estimates, the Nation spent \$40.6 billion for pollution control in 1977, approximately \$187 per capita. This was equivalent to 2.15 percent of our gross national product. Approximately half, however, would have been spent without environmental legislation; only \$18.1 billion, or less than one percent of our GNP, was spent in response to environmental laws. The proportion of total plant and equipment expenditures made for pollution control has not increased substantially in the last 5 years.

CEQ also projects that the incremental pollution abatement costs (the additional costs resulting from Federal environmental regulations beyond what would have been spent in the absence of environmental legislation) will total \$289.1 billion for 1976 through 1985. This is essentially the same as past years' estimates after adjusting for inflation and a change in the period covered. Slightly over half, \$153 billion, is for water pollution control and 40 percent, \$117 billion is for air pollution control. Throughout the report CEQ stressed that the U.S. has made important improvements in our environment and is realizing such economic benefits as lower expenditures for health maintenance and for protection, maintenance, and repair of property.

On the basis of its macro-economic analyses, the Council does not expect pollution control expenditures to have a major impact, either positive or negative, on the economy. □

An Environmental Accounting

THE CHALLENGE OF ENVIRONMENTAL EDUCATION



In the early 1960's Adlai Stevenson reminded us that all men and women were in reality brothers and sisters as we traveled together in this fragile, awe-inspiring space ship called Earth.

But it required the successful Apollo moon-landing during the summer of 1969—an event witnessed electronically by over a billion individuals—to permanently modify our species' world vision of the Planet Earth. It is now commonplace to visualize our earthly home as a blue-green, cloud-flecked oasis whirling alone in the frigid darkness of space.

Since the early 1970's world-wide concern for the continuing health of the biosphere and its interrelated eco-systems has grown in intensity, propelled by a belief that the 1970's may well be our last chance for a future that makes ecological sense.

The United States quickly exerted international leadership at the beginning of this decade by the passage of two related landmark pieces of environmental legislation—the National Environmental Policy Act (NEPA) and the Environmental Education Act. Soon other nations created their own environmental protection agencies and passed their own national legislation to protect the environment.

In June, 1972, this heightened global concern led to the UN Conference on Human Environment in Stockholm, Sweden, during which thousands of delegates and participants stressed the important role of education

of both the general public and the specialist in the solution and prevention of the world's environmental problems.

Environmental education was specifically stressed in Recommendation #96, which called on "The organization of the UN systems, especially UNESCO . . . to take the necessary steps to establish an international program in environmental education, interdisciplinary in approach, in-school and out-of-school, encompassing all levels of education and directed toward the general public . . ."

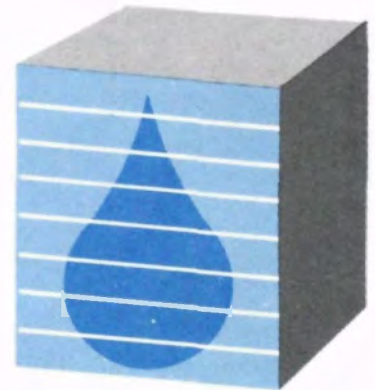
Beginning in 1974, UNESCO, with financial and program assistance from the United Nations Environmental Program (UNEP), embarked on an International Environmental Education Program, consisting of international consultants and surveys (1974-75), Trend Papers and Belgrade Workshop (1975), Regional Seminars (1976-77), all of which culminated in the ministerial level Intergovernmental Conference on Environmental Education at Tbilisi, USSR, October 12-26, 1977, attended by 340 delegates.

To prepare for Tbilisi, the United States established a large national task force under the Federal Interagency Committee on Education (FICE). The 70 members of this group were drawn from the various sectors of the Federal and State governments, industry, higher education and nongovernmental environmental-conservation organizations. Beginning in late 1976 this group, headed by Dr. Alex Barton of the National Science Foundation, reviewed existing environmental education materials and programs, developed position papers, and made recommendations to the

State Department on the make-up of the United States delegation. Largely as the result of these detailed support efforts, our delegation arrived in Tbilisi with a broad array of positions to present, knowledge of the diverse views of U.S. groups and individuals who are concerned with environment and education, and copies for distribution of a FICE document, "The Fundamentals of Environmental Education", and a sampler of environmental education activities in the United States, as well as other American-produced books and materials on environmental education.

The purpose of the Tbilisi conference was "to formulate recommendations for action which might be undertaken at the national, regional, and international levels for the promotion and development of environmental education."

Sixty-six member states of UNESCO sent official government delegations to the Tbilisi conference. Also attending were observers from two non-member states, eight other United Nation organizations,

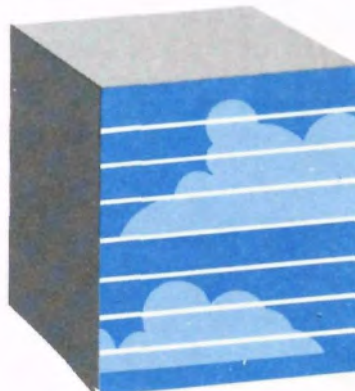


three intergovernmental organizations and 20 international non-governmental organizations.

An overview of the agenda reveals the close association between environmental problems and the educational response necessary to help mitigate or resolve these problems. This is the approach that the United States worked out in NEPA and the Environmental Education Act—at least in theory if not in actual practice. The agenda items for Tbilisi included:

- major environmental problems in contemporary society;
- role of education in facing the challenge of environmental problems;
- current efforts at the national and international levels for the development of environmental education;
- strategies for the development of environmental education at the national level;
 - a) general environmental education of the public through formal and nonformal education;
 - b) environmental education (including in-service education)

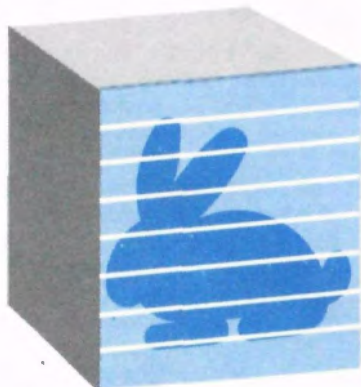
Mary F. Berry is HEW Assistant Secretary for Education and George E. Lowe is a staff official of the Energy and Education Action Center, U.S. Office of Education.



of particular professional groups whose actions and decisions have implications for the environmental, regional, and international cooperation for the development of environmental education.

Based on the American experience and leadership in environmental education (1969-1977), the results of the Belgrade Workshop (1975) and the worldwide regional meetings (1976-1977), The Intergovernmental Conference on Environmental Education unanimously agreed in the *Draft Final Report* recommendation #6, "General Statement on Goals, Objectives and Guiding Principles", that environmental education should:

- consider the environment in its totality—natural and built, technological and social aspects (economic, political, technological, cultural-historical, moral, aesthetic);
- be a continuous lifelong process; it should begin at the pre-school level and continue through all formal and non-formal stages;



- be interdisciplinary in its approach, drawing on the specific content of each discipline in making possible a holistic and balanced perspective;

- examine major environmental issues from local, national, regional and international points of view so that students receive insights into environmental conditions in other geographical areas;

- focus on current and potential environmental situations, while taking into account the historical perspective;

- promote the value and necessity of local, national, and international cooperation in the prevention and solution of environmental problems;

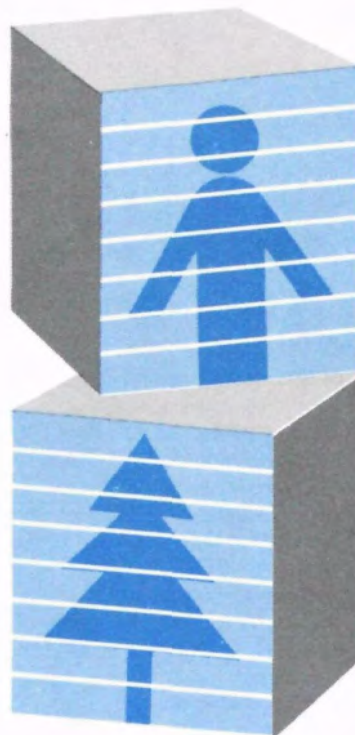
- explicitly consider environmental aspects in plans for development and growth;

- enable learners to have a role in planning their learning experiences and provide an opportunity for making decisions and accepting their consequences;

- relate environmental sensitivity, knowledge, problem-solving skills, and values clarification at every age, but with special emphasis on environmental sensitivity to the learner's own, community in early years;

- help learners discover the symptoms and the real causes of environmental problems;

- emphasize the complexity of environmental problems and thus the need to develop critical thinking and problem-solving skills;



- utilize diverse learning environments and a broad array of educational approaches to teaching and learning about and from the environment with due stress on practical activities and immediate experience.

The U.S. Delegation's initiative at Tbilisi, and non-governmental environmental education leadership throughout the past decade, have provided the conceptual framework for the 41 adopted recommendations and generally have established guiding principles and goals for environmental education internationally. The United States still has not developed a national strategy or action plan for environmental education.

But we must adopt a national environmental education policy, a funding strategy, and program criteria before the end of this decade of the environment.

We believe that the key items of agreement at Tbilisi, which generally reflected the current theoretical and actual pattern of environmental education in the U.S., could serve, along with the guiding principles, as the basis for a national action plan in environmental education.

These key items of agreement from Agenda Item #10 (Strategies for Development of Envi-

ronmental Education at the National Level) stated that:

- The goals of environmental education are:

- a) to foster clear awareness of and concern about economic, social, political, and ecological interdependence in urban and rural areas;

- b) to provide every person with opportunities to acquire the knowledge, attitudes, values, commitment, and skills needed to protect and improve the environment;

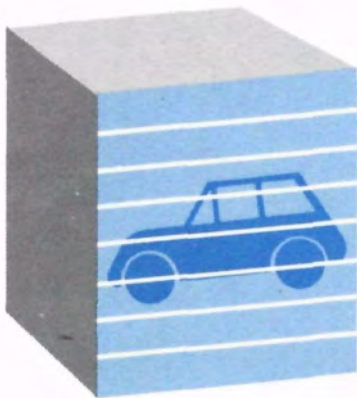
- c) to create new patterns of behavior of individuals, groups, and society as a whole toward the environment.

- Environmental education is an integral part of the education process—centered on problems of environment—building up a sense of values contributing to public well-being.

- Environmental education is a lifelong process, not confined to the formal education system, integrating education concerning the work environment, education for the consumer, and education related to economic development; its subject matter should permeate every part of the formal and non-formal programs.

- In developing formal environmental education programs at all levels, attention must be given to curricula, textbooks, teaching aids and resources, methods, and teacher/leader training.

- The central idea of environmental education is to create and foster interdisciplinary programs in practical education oriented toward solution of problems of the environment.



• The training of personnel is considered a priority requirement.

• The variety of aims, institutions, traditions, and manners of perceiving problems, combined with frequent vagueness of terminology is such that no attempt should be made to place environmental education for specialists in a universal mold.

• Great stress was placed on the development of environmental education for apprentices and adults in technical occupations, particularly agriculture, and on the need to develop environmental education both for university level professions and for post-secondary technical education levels.

• Both legislation and regulation for the protection of the quality of the environment and legislative measures for the provision of appropriate environmental education opportunities should be developed.

• Non-governmental organizations have crucial roles in non-formal environmental education in various types of programs and activities already under way in most countries, such as literacy programs and family education.

• Effective use of the mass media to provide information to the general public is important and can be initiated by coordination between ministries of education and agencies responsible for communications.

The major conference recommendations could serve as the basis for specific actions by Federal, State, and local institutions in the United States. This could be achieved by redirecting existing resources and by a renewed policy emphasis which would ensure:

• that teacher college curricula be revised to incorporate environmental subject matter;

• that in-service teacher training incorporate curriculum material related to the environment;

• that training for such professional occupations as economist, architect, engineer, or forest manager, incorporate environmental instruction;

• that model textbooks and other learning materials reflecting environmental concerns be developed;

• that research and development be focused on learning methodology in environmental education;

• that we disseminate information on environmental education to individuals and institutions on a systematic basis;

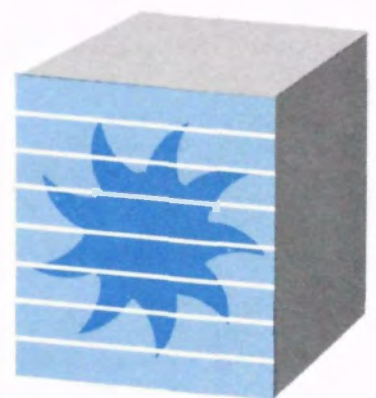
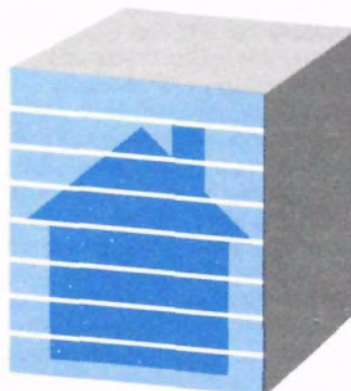
• that we move in a systematic and careful manner to increase interdepartmental and inter-agency cooperation.

A recent report on the Inter-governmental Conference on

Environmental Education, "Toward An Action Plan" was prepared for the Federal Inter-agency Committee on Education by Dr. James Aldrich, formerly Executive Director of the Alliance for Environmental Education and now Vice President of the Massachusetts Audubon Society. It provides recommendations for new interdepartmental efforts to implement these commitments.

The Tbilisi Conference recommended that each nation establish a National Center on Environmental Education to coordinate the multidisciplinary, multi-agency responsibilities and focus on the interdependence and interrelatedness of environmental problems, issues and systems: (energy, environmental, ecological, ethical, economic, political, social, scientific, technological, and educational.)

Federal agencies have a great deal of interest in environmental education and individually have very significant capabilities and expertise about it. However, it is also our view that it is time for the Federal Government to take the leadership role in promoting and coordinating environmental education efforts so essential to our Nation's future. All Federal agencies should better utilize



their resources of land, money, and personnel in order to shape a Federal response to the challenge of environmental education. We must develop stronger cooperative relationships between Federal and State agencies and colleges and universities in devising special regional emphases.

The following agencies have a vital interest in establishing cooperative arrangements with educational institutions and organizations for environmental education purposes:

• Environmental Protection Agency (environmental impacts and assessments, information and training programs on water, air, solid waste, pesticides, noise, and radiation pollution.)

• Department of Energy (energy impacts, assessments, ecologically and environmentally sound alternative energy sources, energy-related environmental education.)

• Department of Commerce (National Oceanic and Atmospheric Administration's Coastal Zone Management and Sea Grant programs for public and formal education about the

development and pollution problems of the oceans and estuaries.)

- Department of Labor (training, retraining, and careers in environment-energy related occupations.)

- Department of Agriculture (Youth Conservation Corps, Soil Conservation Service, and Forest Service programs on land use and forest use, alternative farming systems (Integrated Pest Management, organic farming, bio-mass, methane digesters, solar drying and heating.))

- Department of the Interior (Fish and Wildlife Service, National Park Service and Bureau of Land Management's people, land, programs and funds.)

- Housing and Urban Development (urban environmental issues, including ecologically sound community development, population dynamics, and environmental impact.)

- Department of Transportation (alternative transportation systems and impact on land use.)

- ACTION (voluntary programs by students, youth, and citizens in the conservation of natural resources, including energy.)

- Tennessee Valley Authority (energy-related environmental education, regional environmental problems unique to Appalachia.)

- Health, Education and Welfare (health implications of environmental pollution and human ecology, health education, education for environmental-energy related occupations.)

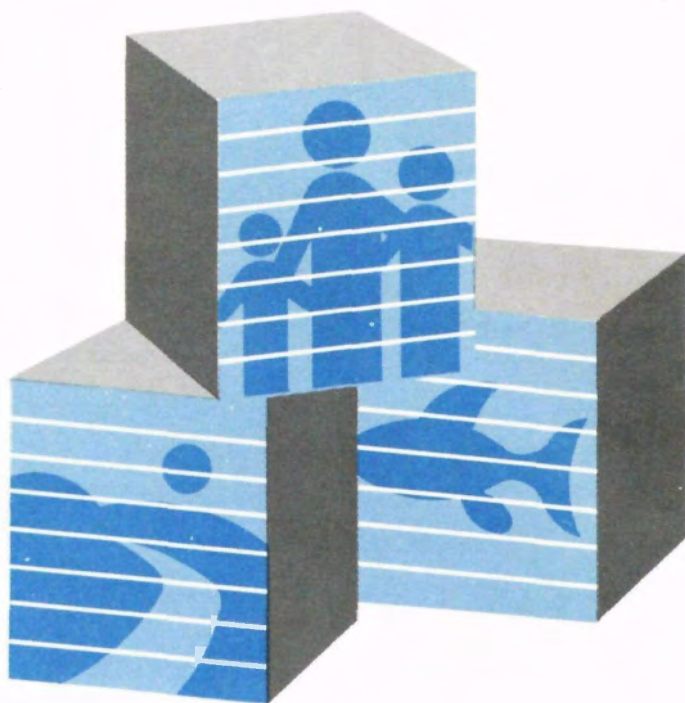
In addition, we have an overriding imperative and obligation to provide the appropriate education for our children, who will be faced with an increasing number of vital decisions during the next century affecting their world and its ecosystems in the interrelated areas of energy, natural resources, pollution control, environmental health, and environmental protection. We must ensure that their education prepares them to deal with these matters wisely; this must become a basic educational goal of our Nation and the world.

Nearly 30 years ago Aldo Leopold, ecologist and naturalist, asked:

"Does the educated citizen know he is only a cog in an ecological mechanism? That if he will work with that mechanism his mental wealth and his material wealth can expand indefinitely? But that if he refuses to work with it, it will ultimately grind him to dust?"

Every school child in the United States should be engaged in both field and classroom study of the great natural systems on land and sea that sustain us all and, hopefully, produce both ecological balance and productive harmony. Eventually, we could seek to develop a broad-based environmental ethic in our people that will alter our habits.

President Carter has observed that "millions of individuals, throughout the world, have adopted an environmental conscience to test and guide public and private actions." Our larger purpose as educators should be to nurture that environmental conscience and ultimately to provide every individual with the information needed to properly evaluate the environmental consequences of his actions.



We need a total program of environmental education that covers both students currently in school and adults who have completed their formal education; such a program would provide an understanding of the interrelationship of global ecological balance to weapons of mass destruction, energy, resource depletion, environmental pollution and population density within the context of a viable economic system. An integrated national program of environmental education would involve a continuing education process from early childhood to adulthood, to be carried out by both the formal and non-formal educational institutions in cooperation with the international sector, the Federal, State and local governments and the wide variety of concerned non-governmental organizations. □

News Briefs

Hearing on Seabrook Nuclear Plant

EPA Administrator Douglas M. Costle has announced that he will hold a hearing about June 5 in New England on environmental issues involved in the proposed operation of a nuclear power plant at Seabrook, N.H.

The exact time and place of the hearing to be held as a result of a court of appeals decision will be announced later. At the hearing, members of EPA's technical panel which advised Costle on the original decision approving the design of the cooling system will be available for cross examination. The Administrator also said that he will open the record to receive any additional evidence that may be available now. EPA's role in the Seabrook case concerns only the environmental acceptability of the planned cooling system discharges. Several environmental groups have opposed proposed discharge of huge amounts of heated water into the ocean from the plant on the ground that it would harm sealife.

Conservation Organizations

Continued from page 13

or degrade other natural values. These struggles are now common, and victories are not uncommon.

They apply the power of knowledge in order to influence strong conservation decisions; they do their homework and don't espouse the doctrine of "don't confuse me with the facts." Thus, when responsible spokesmen for the conservation viewpoint speak to administrators or to legislators, they are usually listened to with respect.

Very importantly, a major victory took place in the Congress late in 1976 which substantially benefits most non-profit organizations. Now they can spend accountable, definite percentages of income on influencing legislation, and can communicate with their membership, without fear of losing deductible donations.

What else does the future hold? I predict that evolutionary change will continue in citizen organizations as in other aspects of a vital human society. Furthermore, I believe there is an increasing need for greater citizen activity. While some organizations will fail, others will prosper, and organized citizen efforts in conservation overall will

continue to grow.

Environmental leaders continue to be concerned about how to coordinate efforts towards similar goals and how to keep uninformed or hysterical voices from discrediting the movement. I believe that there are counterbalancing fringes on the far sides of almost any controversy that makes the calm and thoughtful voices more credible by contrast. But how do we achieve better, more effective coordination? Occasionally sincere observers suggest merging all into one monolithic organization which, speaking with a thunderous voice for all conservationists, would surely shake the halls of Congress. History indicates that this will not happen and, if it did, it would be only a matter of time until restive groups would split off or form new groups to express independent views. After all, we live in a pluralistic society—and Americans join organizations which further their very particular interests—birding, gardening, backpacking, fishing, or whatever. Their organizations can and do pursue particularized ends and also collaborate for common ends.

The most prestigious mechanism for coordination is the venerable Natural Resources Council of America, already mentioned. But ad hoc coalitions are common and can be organized almost at the drop of

a developer's hat, or at the flaunting of a dam builder's blueprint.

In conclusion, I believe the American system works best when the public and private sectors both work well. Private organizations do strengthen the work of public agencies when they act as watchdogs, critics, goads, and keepers of the social conscience. The private sector and its dedicated volunteers do educate the public by issuing early environmental warning cries, by pleading with government agencies, by confronting industry at times, and generally by prodding and pushing for constructive change. This need is constantly growing.

I believe that government would almost constantly favor narrowly-focused special interests seeking short-term gain at the expense of broader, longer-term environmental values, unless volunteer citizen groups, with knowledge, skills, and experience, provide strong, unselfish counterpressures. In addition, these groups have the ability to monitor environmental degradation at the grass-roots level—something the government is poorly equipped to do and which would cost it huge sums.

Americans organized to defend the integrity of the environment are a force to contend with. Their numbers and commitment will continue to grow. □

People

Andrew Breidenbach

The former Assistant Administrator for Water and Hazardous Materials is leaving EPA to accept a high-level position with the environmental consulting-design firm of Roy F. Weston, Inc., of West Chester, Penn. Since last June, Breidenbach has been serving as a Special Assistant to EPA Administrator Douglas M. Costle.



Breidenbach is recognized authority in a number of environmental areas including pollution measurement and solid waste management. He has lectured frequently throughout the United States and abroad. He serves as Adjunct Professor of Environmental Health and Civil and Environmental Engineering at the University of Cincinnati.

Pierre Shostal

The Executive Secretary of the US-USSR Environmental Agreement recently served on a panel on U.S.-Soviet Cooperation in Science and Technology at the International Studies Association convention, held in Washington, D.C. Shostal summarized the history of the Agreement, and outlined activities planned for 1978.



Doris Thompson

She has been designated to be the new Director of the Office of Civil Rights, with responsibilities for implementing programs for the career advancement of minorities and women in the Agency, assuring equal opportunity in employment at EPA, and prohibiting discrimination in employment on projects receiving EPA financial assistance.

ance.

Thompson was previously Federal Women's Program Coordinator for the Department of the Army, the top-level position there for women's affairs.

Prior to that, she was Federal Women's Program Coordinator with the National Security Agency, where she began her career in 1952 as a linguist and research analyst.

During her twenty-three years with the National Security Agency, she served in a variety of staff and supervisory positions of increasing responsibility, including that of Director of Advanced Management Programs for the National Cryptology School and as project officer of executive level seminars.

A native of Washington, D.C.,

Ralph H. Scott

This national authority on pulp and paper wastes has retired as Chief of the U.S. Environmental Protection Agency's Wood Products Staff in Corvallis, Oregon.

Scott's public service career began in 1941 as a sanitary engineer with the Wisconsin State Board of Health. During World War II as a commissioned

officer in the U.S. Army Sanitation Corps, he continued his work in the field of environmental health. At the time of his discharge he was in charge of water supply and base sanitation on Guadalcanal. After the war he served a year as a chemical engineering instructor at the University of Wisconsin, after which he joined the Wisconsin

State Committee on Water Pollution, where he rose to the position of Assistant Director.

Moving to Portland in 1962 as an industrial engineer with the Federal Water Pollution Control Administration, an EPA predecessor agency, he became intimately familiar with waste treatment problems facing the forestry and pulp and paper industries. Scott transferred to

the FWPCA's Pacific Northwest Water Lab in 1966 to take charge of its national research program on waste treatment in the pulp and paper industry.

In 1973 and 1975 Scott was a member of delegations to the Soviet Union under the U.S.-U.S.S.R. Environmental Technology Exchange Program on the Pulp and Paper Industry.

Frans J. Kok

He is the new Director of the Economic Analysis Division, Office of Planning and Management. "In view of the increasing role of the economic agencies in reviewing EPA's regulatory actions," said Assistant Administrator William Drayton, Jr., "I expect Frans to play a key role in the development and defense of EPA regulations."

Organizationally, the Economic Analysis Division falls under the Office of Planning and



Evaluation, where the Division's previous Director, Roy Gamse, is now Deputy Assistant Administrator.

Kok comes to EPA from Booz, Allen & Hamilton, where for the last three years he managed international assignments in the areas of industrial analysis and organizational development. Prior to this he worked for two years in Colombia as a consultant to a number of local companies.

Kok received his undergradu-

Breidenbach has also recently been nominated for the American University's Roger W. Jones Award for Executive Leadership. In announcing his nomination, Costle noted that Breidenbach's "outstanding career has reflected a continual commitment to managerial excellence in public service." The award is made at the university's Spring honors convocation.

From August 1971 to July 1975—prior to his service as an EPA Assistant Administrator—he was the Director of the National Environmental Research Center in Cincinnati, which was the largest of EPA's major research centers. From 1967 to 1971 he was Director of the Division of Research and Development for the Solid Waste Management Office at

HEW. He has held several other important Federal positions in the area of environmental protection.

In his position as Executive Secretary, Shostal works with EPA Administrator Douglas M. Costle, who is the U.S. Co-Chairman of the Environmental Agreement, which involves participation by some 12 Government departments and agencies. EPA's role, primarily in the areas of air and water quality and the health effects of pollution, is one of the most

important in the Agreement. Cooperative work with the U.S.S.R. is also underway in the fields of climate, nature preservation, urban environment, earthquake prediction, and marine pollution.

Shostal was born in France in 1937. He received his B.A. from Yale in 1956, studied at the Geneva (Switzerland) Institute of Higher International

Studies, and received an M.A. in 1958 from the Fletcher School of Law and Diplomacy, jointly administered by Harvard and Tufts Universities. He joined the Department of State as a Foreign Service Officer in 1959 and has served in several overseas posts. He became Executive Secretary of the U.S.-U.S.S.R. Environmental Agreement in August, 1977.



she attended the University of Vermont and received her B.A. from Smith College in North Hampton, Mass. She has done graduate work at Harvard University and the George Washington University. Her appointment is subject to Civil Service approval.

Vencil L. Shively

He has been selected by EPA Regional Administrator Alan Merson to be Director of Public Affairs and Intergovernmental Relations in Region 8, Denver.

For the past three years, Shively has been Director of Community Development and Technical Assistance for the Colorado West Area Council of Governments in Rifle, Colo.,

as well as a rancher.

From 1969 to 1975 he was director of the University of Colorado's Bureau of Community Services and Associate Director of its Center for Urban Affairs.

Since 1965 Shively has served as a Director, researcher or consultant for a variety of planning and development programs at the neighborhood, commu-

nity, urban, and Statewide levels.

As Director of EPA's Office of Public Awareness and Intergovernmental Relations, Shively will be responsible for informing and involving citizens in Colorado, Montana, North Dakota, South Dakota, Utah, and Wyoming about the Agency's programs. He will serve as the chief liaison between EPA's Regional Office and Congressional and

other elected officials in those six States. Shively, 39, is a native of Snowmass, Colo.

ate degree in Economics from Occidental College in Los Angeles and an M.A. in Economics from California State University. In addition, he holds M.B.A.'s from Harvard Business School and Insead in Fontainebleau, France. While at Harvard he worked at the Harvard Economic Research Project on the economic impact of increased recycling of waste paper in the U.S.

Donald W. Sadler

He has been selected to be the EPA Headquarters Personnel Officer. His new responsibilities will involve directing and administering a personnel management program for all EPA activities in the Washington, D.C., area including employment, position management, employee and labor-management relations, and training.

Sadler came to EPA in 1974 from the Navy Department where he was a Personnel

Management Specialist and Special Assistant to the Personnel Director of the Washington Navy Yard. In EPA, he has served as a Position Classification Specialist, Personnel Servicing Team Leader, Assistant Director of Personnel for Classification and Training, and Assistant Director of the Personnel Operations Branch.

He received his B.A. in Political Science from the University of Connecticut. He has done graduate work at the University

of Maryland in Political Science and George Washington University in Personnel Management.

Controlling Chemical Spills

By Dave Cohen

With a clamor of earthquake proportion, a freight train jumps from the railbed. One of its tank cars ruptures, and deadly chemicals escape into the atmosphere. In the end, some innocent citizens may die, more may be hospitalized, and sometimes there is the need for mass evacuation of an entire community.

With a disturbingly high frequency, accidents of this nature happen to trains, to trucks, to barges, and to other types of transport. No one is ever sufficiently prepared for such disasters. Now, through a new set of regulations EPA is putting into effect regarding the transport of hazardous materials, there is hope that ample preparation can be encouraged through the use of better management practices designed to reduce the risk of unnecessary environmental disasters.

"These proposed regulations are designed to deal with the often tragic destruction of our environment from toxic chemical spills in rivers, streams, and other waterways," Administrator Douglas M. Costle said in announcing the new policy.

"We know that at least 700 damaging spills occur each year from tank cars that break open, from train derailments, from rusty valves and pipes that won't work, and from people who deliberately pour chemicals into sewer systems, ditches, and rivers. The result can be unsafe drinking water, fish kills, wildlife destruction, evacuation of communities, and even loss of life.

"These incidents often result from an appalling negligence and lack of good management practice. In a society that moves millions of gallons of chemicals a year, it is, if I may be frank, outrageous that the best safeguards available aren't always applied."

The new regulations will protect public health and the environment from spills into waterways of 271 hazardous chemicals. They authorize multi-million dollar fines for those responsible for chemical spills, but the primary purpose is to promote safe storage, handling and transportation.

The program requires immediate notification of the Coast Guard when a spill or other unauthorized discharge occurs. It permits the government to recover clean-up costs, and provides for substantial penalties as an incentive to prevent spills or lessen their harmful effects.

"The high penalties and liabilities in these



This aerial photo of a derailed train shows the jumble of freight cars, including some tankers containing deadly gases.

regulations should serve as an incentive to apply the appropriate safeguards and prevent accidents," Costle said. "Failure to report an accident could result in criminal penalties of up to \$10,000 or a year in jail or both. The civil penalties resulting from the spill itself could reach \$5 million. And the government would be able to recover clean-up costs up to \$50 million. In cases of 'willful negligence,' there is no limit to the dischargers liability for clean-up costs."

The regulations were established under authority of Section 311 of the 1972 Water Pollution Control Act, as amended, which recognizes the environmental and health dangers associated with unauthorized chemical discharges into the Nation's waterways.

The new program applies to all potential discharge sources, including trucks, trains, ships, and fixed facilities like industrial and storage plants.

In most cases, the substances covered by the new program are commonly produced, and include nitric and sulfuric acids, caustic soda, benzene, ammonia, chloroform,

Dave Cohen is an Assistant Editor of EPA Journal.

certain compounds of arsenic, antimony and mercury, and many pesticides.

EPA is further proposing a supplementary list of 28 chemicals to be added to the initial list of 271 substances now covered by the regulations, which were proposed in 1975. The new list proposed includes Kepone and carbon tetrachloride, discharges of which have caused serious environmental and public health problems within the past two years. EPA plans to expand the list when needed, as information on the hazards associated with other chemicals is developed and analyzed.

The regulations were issued in four parts, which cover:

1. *The initial list of hazardous substances.* The list was developed through toxicity tests on fish and shellfish and analysis of data on production, distribution, and use. All substances on the list are hazardous and have a reasonable chance for spillage due to wide-spread use. EPA may add to the list as the need develops.

2. *Determination of which substances are "removable" once spilled.* Whether or not a substance can be physically removed from waterways is one factor that may affect the size of penalties imposed. Almost all the substances were determined to be "non-removable" due to their chemical and physical properties. Even so, the discharger is encouraged to take prompt action to minimize the damage resulting from a spill. Doing this may reduce some of the penalties imposed.

3. *Determination of what amount is a "harmful quantity" when spilled.* The law requires that this be defined for purposes of spill reporting and enforcement action. Based on their relative potential hazard, the substances were divided into five groups. A relative "harmful quantity" was then assigned to each group; for the most toxic group, that amount was determined to be one pound. The remaining four less toxic categories were assigned proportionally larger harmful quantities.

4. *Establishment of appropriate penalties.* The Water Act authorizes civil fines up to \$5 million for vessels and \$500,000 for other facilities for each discharge or spill in excess of the established harmful amount. This is intended to promote the development and use of preventive measures. Any fine over \$5,000 will be determined by the gravity of the offense. This is calculated using such factors as the size of the spill, the degree to which the responsible party is at fault, the degree to which the chemical dilutes and degrades in water, and the nature and success of efforts taken to lessen the spill's harmful effects. Penalties must

How the New Program Will Work

A Procedural Case History

A tank truck carrying a hazardous substance overturns, and the contents drain into a river. Based on procedures established by the regulations, the following actions would then take place:

- The trucking firm immediately notifies the Coast Guard's National Response Center at (800) 424-8802 and appropriate State authorities, if required by State law, to report the spill.
- The Response Center alerts a specially trained response team from either EPA or the Coast Guard. EPA provides the response team for spills in inland waters; the Coast Guard is responsible for coastal waters and the Great Lakes.
- The response team is led by an expert On-scene Coordinator, who notifies State authorities and any downstream water users (such as water utilities) that might be affected by the incident.
- The On-scene Coordinator then goes to the scene of the spill. He collects information on the incident, including whether or not a "harmful quantity" of the substance has been released. If the discharger is taking adequate steps to clean up the spill and keep its harmful effects to a minimum, the On-scene Coordinator merely keeps track of clean-up progress. If adequate steps aren't being taken, he may take over clean-up, employing whatever means are needed to solve the problem. He may seek assistance from private firms specializing in clean-up operations. Depending on the chemical involved and the particular situation, actions can include the addition of

chemicals to neutralize the spill, the evacuation of people nearby, the release of water upstream to increase dilution, removal of the substance, the installation of water filters, or containment of the substance spilled.

- Following the spill, EPA's Regional Administrator assesses an appropriate penalty, based on the gravity of the offense. He then sends a Notice of Violation to the alleged violator, which contains the amount of the assessed penalty and describes actions the violator may take.

- The violator, within 30 days of receipt of the Notice, may present explanatory information to the Regional Administrator; he may also request a hearing within 45 days.

- If a hearing is requested, the Regional Administrator appoints a Presiding Officer, who conducts the hearing and prepares a recommended decision. He gives his recommendations to the Regional Administrator, including a recommendation as to the civil penalty, within 30 days of the hearing. He must clearly state the basis for his recommendations.

- The Regional Administrator acts on the recommendations within 15 days. His decision is final, unless the violator appeals to the Administrator within 15 days. (The Administrator may also stay the effectiveness of the Regional Administrator's decision on his own motion.)

- The Administrator's action can be reviewed in District Court.

- All penalties and clean-up costs are placed in a revolving fund used to pay the costs of government clean-up actions. Congress has authorized this fund to be maintained at \$35 million. □

by law be imposed for failure to notify the Coast Guard immediately when a spill occurs.

The new program complements the existing oil spill control program which EPA conducts in conjunction with the Coast Guard. Under that program, EPA has responsibility for the control and clean-up of oil spills in inland waters; the Coast Guard has authority to deal with oil spills in coastal waters and on the Great Lakes. The two agencies will have the same relative responsibilities under the new program.

Spills should be reported to the Coast Guard by calling toll-free (800) 424-8802; in the Washington, D.C. area, call (202) 426-1830.

"I want to make it clear," Costle said, "that our purpose is to promote the great-

est possible protection of our health and that of our environment by encouraging responsible management in the storage, handling, transportation, and use of hazardous materials. The high penalties that can be imposed should serve as an incentive to industry to use greater care in these activities. For example, the use of safer and more efficient containers could by itself accomplish much in reducing accidental discharges.

"A great deal more care and better management is needed if we, as an industrialized Nation, are to be truly responsible in our handling of such substances as they are used, stored, and moved in daily commerce. Our experience has proved this." □

Region 4 Report

By John C. White

*Administrator,
United States Environmental
Protection Agency, Region 4.*

"What's happened to the environmental movement?" a Louisville newspaper asked recently. An editorial asserted that now one seldom sees environmental protest marches and sign-waving.

Well, as any of us on the government side of the action can report, the movement is quite alive—and still kicking, when the need for it is there.

The answer to the question, in part, is that government, now armed with legal tools, is much more responsive. No longer is fiery exhortation necessary.

Overall, what I think is happening here in the upper half of the seventies is that both the environmental movement and the environmental bureaucracy have come a long way. An observable professionalism is apparent in both.

I thought the old enforcement conferences were great tools for the environmentalists and the environmental bureaucracy in the late 1960's and early 1970's. The environmentalists could shout, and we would point fingers, then we all would do some bluffing—and quite a few people were shamed into doing right. In fact, some of our biggest success stories of today had their genesis in the old enforcement conferences. Escambia Bay in Pensacola is one that comes to mind. I can still see some of those ladies waving pictures of the menhaden fish kills. The bay surface was so white with the bodies of dead fish that it looked like Buffalo in February.

If some of the flash fire of the early days is missing, I believe it has been replaced by professionalism. I could see results of EPA's new "constituency" approach as we stepped up our efforts at educating everybody to the perils of unbridled use of the automobile. In the Region, perhaps our biggest push during this year will be for our cities, where air quality standards have not been met. At this writing, we are informing the city council of one large southern city about the air quality problem and are counting heavily on help here and elsewhere from our friends in the volunteer environmental army.

Meanwhile, we are concerned about the menace of new toxic substances. But we are learning how to meet this challenge. An outstanding example of this came in late spring of 1977 when 32 employees of a Louisville, Ky., municipal treatment system suddenly were made ill by a noxious substance obviously within the plant. But what? How could it be contained? And who was the offender? One of the answers to these questions awaits court disposition, but teams of scientists from EPA and other Federal agencies, plus State and local authorities, aided and spurred on by aroused citizens and news media, discovered much of the cause, effect, and remedy. The cause, the Region's surveillance and analysis division determined, was two chemicals with the jawbreaker names of hexachlorocyclopentadiene and octachlorocyclopentene, which had been surreptitiously discharged into the sewers leading into the plant. By June the plant, which had been shut down while the investigation and tests were under way, was returned to 90 percent operating capacity. During the interim, wastes were discharged directly into the Ohio River, requiring a large amount of testing at water intake locations south of Louisville, since many cities use the river as a water supply. By the fall of the year, the cleanup operations were well under way in the plant and in the interceptor sewer.

Another example comes to mind of the growing professionalism of the environmental movement at all levels. The goal of Public Law 92-500—that all discharges of pollutants into the Nation's waterways cease by 1985—is accompanied by growing concern over the shortage of clean recreational and drinking water. Thus it is the policy of EPA that where sufficient land is available, and the hydrological conditions are favorable, construction grant applicants give particular attention to waste-

water treatment processes which renovate and reuse wastewater as well as recycle the organic matter and nutrients in a beneficial manner. The agency requires that wastewater renovation by methods such as spraying on land be evaluated in wastewater treatment planning.

All of the above factors, and more, came into play in a recent \$22,000,000 award by EPA for a 20-million-gallon land application project in Clayton County, Georgia. In Georgia as in other States in this region, there are many rural communities and there is an abundance of agricultural and forest land which can be used for land treatment of wastewater. In addition, sophisticated research facilities and the necessary technology for treating wastewater by new methods have been developed.

Groundwater in the land treatment sites in Clayton County is currently a source of drinking water. It is anticipated that about 85-90 percent of wastewater applied on land will be recycled for drinking water.

Meanwhile, since secondary treatment does not eliminate the nitrogen and phosphorus from wastewater, the 3,000 acres of the county's open land where the wastewater effluent will be sprayed will be greatly enriched for farm crop use. Land application treatment might generate new agricultural industry growth in the county.

During the past year in regional enforcement activities, some large civil penalties again were collected for water permit violations, most of them agreed to in consent decrees. They include: \$200,000, Beau Knit II, Elizabethton, Tenn.; \$30,000, Ralston Purina, Trussville, Ala.; \$25,000, Tennessee Electroplating, Ripley, Tenn.; and \$21,000, The Carr Company, Knoxville, Tenn. But another attention-getter for enforcement personnel was the mammoth chore of processing permits for the numerous coal mine and coal preparation plants within the region. More than 900 applications for permits were on file when the push to service the mines began. A minority contractor assisted in the preparation of public notices to reduce



the paperwork workload for the mines. Soon after the public received the notices in the coal-mining States of Tennessee, Alabama, and Kentucky, comments and requests for hearings began arriving. Five public hearings were held, and it was determined that some 300 mining operations had either been completed or did not require permits. Yet, each hearing produced lists of mines which might require permits. In order to insure compliance with permit limitations, a regional mine water enforcement team was organized to make field inspections, review discharge monitoring reports, and issue permits to new applicants.

A major and continuing pollution problem in the region is phosphate mining. Huge mining reserves are located in Florida, North Carolina, and Tennessee. North Carolina has one mining site now operating and another about to begin. In Tennessee,

nearly 30,000 acres of land have been disturbed by phosphate mining. Florida is the major phosphate producer in the United States, Polk County, in central Florida, contains the largest deposit and is the center of production. Approximately 110,000 acres of phosphate-mined land in the State is being worked and about 300,000 acres have been reclaimed. Some 80,000 to 90,000 acres of unreclaimed land have returned to a natural state and may not need further reclamation. However, one major concern with phosphate mining is the release of phosphate into nearby bodies of water. The mineral is one of two nutrients needed by algae, and over-abundant supplies of phosphate may cause nuisance growths of algae.

Phosphate also contains uranium, radium, and other radionuclides. These present a potential radiological contamination problem as a result of gaseous and liquid discharges. Land disturbed during stripmining and subsequently reclaimed also presents a potential radiation problem.

This clear mountain lake is located in Unicoi State Park near Robertstown in northeast Georgia.



John C. White

In an effort to find answers to these and other problems, a \$1 million study was begun in 1976. Before its release date, tentatively set for early June, there already are indications the survey may not please everybody. It won't stop stripmining, which has given a moon-surface look to thousands of acres in Polk and Hillsborough Counties in Florida. It may not even slow down the industry's current massive expansion into Manatee, Hardee, and DeSoto Counties in the same State. But it will consolidate, for the first time, a wide variety of scientific evidence to guide governmental decisions on the "trade-off" between environmental desecration and economic vitality.

The final report is eagerly awaited by conservationists, who hope that the report will spur strong mining controls—and dreaded by an industry that fears a slash in the big, fast profits on phosphate fertilizers. A survey prepared by Region 4 for consideration in the environmental impact study (EIS) of the Central Florida phosphate industry suggests that conventional slime ponds and the drying of phosphate rock be eliminated, thereby defusing the potential environmental problems of radiation.

This paper was prepared by Region 4's Phosphate Study Unit as a basis for writing the draft EIS. Incidentally, on the subject of impact statements, it is anticipated that 1978 will be a busy year. As a further footnote, I was pleased to hear recently that EPA's Washington headquarters has been very complimentary of the work of our EIS office since its beginning in 1971.

All in all, it was a very good year, with statistics, dates and figures telling part of the story. Some notable successes occurred. So did a few non-successes. Deadlines for water clean-up and air improvement rolled around, and were in some instances extended. Three-quarters of a billion dollars in wastewater treatment plant funds were obligated during the year in the eight States of Region 4. Almost everywhere progress, aided by professionalism, could be noted. □

States Served by EPA Regions

Region 1 (Boston)
Connecticut, Maine,
Massachusetts, New
Hampshire, Rhode Island,
Vermont
617-223-7210

**Region 2 (New York
City)**
New Jersey, New York,
Puerto Rico, Virgin
Islands
212-264-2525

**Region 3
(Philadelphia)**
Delaware, Maryland,
Pennsylvania, Virginia,
West Virginia, District of
Columbia
215-597-9814

Region 4 (Atlanta)
Alabama, Georgia,
Florida, Mississippi,
North Carolina, South
Carolina, Tennessee,
Kentucky
404-881-4727

Region 5 (Chicago)
Illinois, Indiana, Ohio,
Michigan, Wisconsin,
Minnesota
312-353-2000

Region 6 (Dallas)
Arkansas, Louisiana,
Oklahoma, Texas, New
Mexico
214-767-2600

**Region 7 (Kansas
City)**
Iowa, Kansas, Missouri,
Nebraska
816-374-5493

Region 8 (Denver)
Colorado, Utah,
Wyoming, Montana,
North Dakota, South
Dakota
303-837-3895

**Region 9 (San
Francisco)**
Arizona, California,
Nevada, Hawaii
415-556-2320

Region 10 (Seattle)
Alaska, Idaho, Oregon,
Washington
206-442-5810

Update

A listing of recent Agency publications, and other items of use to people interested in the environment.

General Publications

Environmental Quality, 1977. The eighth annual report of the Council on Environmental Quality.

This 445-page book is the definitive statement about the condition of the environment in America during 1977. The major environmental events of the year are covered, including actions related to pollution, energy, natural resources, human settlements, and the National Environmental Policy Act. The report also looks at conditions and trends, in air quality, water quality, environmental health, energy, nonrenewable resources, population, and economics.

Single copies of the report can be obtained by sending a self-addressed mailing label to Publications, Council on Environmental Quality, 722 Jackson Place N.W., Washington, D.C. 20006, (202) 633-7005.

Federal Register Notices

Copies of Federal Register notices are available at a cost of 20 cents per page. Write Office of the Federal Register, National Archives and Records Service, Washington, D.C. 20408.

Toxic Substances Control
EPA prescribes disposal and marking requirements for polychlorinated biphenyls (PCB's); effective 4/10/78. In the Feb. 17 issue. Pp 7150-64.

Air

EPA adopts standards of performance for kraft pulp mills; 2/24/78. Feb. 23 issue. Pp. 7568-97.

EPA announces availability of draft guideline document for control of total reduced sulfur emissions from existing kraft pulp mills; comments by 4/25/78. Feb. 23 issue. Pp. 7597-98.

Regulations Under Consideration

The following rules are being developed by EPA. The Agency encourages public comment. EPA contacts and proposed issuing dates are listed so that interested persons can make their views known. These rules will be issued in May, 1978:

Pesticide Registration Guidelines, to detail the information needed about label development for the registration process, write or phone Bill Preston, (WH-558) EPA, Washington, D.C. 20460 (202) 557-7351; and guidelines for acceptable methods of municipal disposal of sludge, required by Section 1008 of the Resource Conservation and Recovery Act, write or phone Bruce Weddle, (AW-464), EPA, Washington, D.C. 20460 (202) 755-9120.

Films

"Runoff: Land Use and Water Quality" is a 21-minute color film that describes how non-point sources such as storm-water runoff, construction erosion, and farm field drainage contribute to the pollution of the Nation's waters. The film shows how sediment can destroy fish habitat and carry nutrients that contribute to excessive plant growth in bodies of water. The EPA-sponsored film was prepared by the University of Wisconsin. It is available from the Office of Public Awareness (A-107) EPA, Washington, D.C. 20460, EPA Regional Offices, or can be rented from the University of Wisconsin—Extension, Bureau of Audio Visual Instruction, 1327 University Avenue, P.O. Box 2093, Madison, Wis. 53701 for \$5 by referring to film #1765.

Conferences

More information on these EPA Office of Research and Development Conferences is available from Larry Dempsey, Conference Coordinator, Environmental Research Information Center, 26 W. St. Clair, Cincinnati, Ohio 45268 (513) 684-7394.

National Conference on Concepts in Microbial Degradation, Pensacola, Fla. April 10-14.

Petroleum Refineries Symposium, Jekyll Island, Ga., April 26-28.

Sludge Treatment and Disposal Seminar, Portland, Ore., May 3-4.

USA-USSR Symposium on Advanced Equipment and Facilities for Wastewater Treatment, Cincinnati, Ohio, May 9-10.

Coal Cleaning Symposium, Hollywood, Fla., May 14-17.

Advances in Particle Sampling and Measurement Symposium, Asheville, N.C., May 15-17.

Management of Nitrogen in Irrigated Agriculture Seminar, Sacramento, Ca., May 15-18.

Opposite:
Sailboats in Alaska's Juneau Harbor.

Back Cover: This detail is from one of a set of posters produced by EPA on air and water. Single copies of the posters are available from EPA Printing Management (PM-215), Washington, D.C. 20460. Quantities may be purchased from the Government Printing Office, Washington, D.C. 20402.



**"A river is more
than an amenity,
it is a treasure.
It offers
a necessity of life
that
must be rationed
among those who have
power over it."**

Justice Oliver Wendell Holmes

United States
Environmental Protection
Agency

Office of
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