UNITED STATES OF AMERICA

# Congressional Record

PROCEEDINGS AND DEBATES OF THE 91st CONGRESS
SECOND SESSION

## VOLUME 116—PART 8

APRIL 1, 1970, TO APRIL 10, 1970
(PAGES 9923 TO 11270)

UNITED STATES GOVERNMENT PRINTING OFFICE, WASHINGTON, 1970

while get in a hand of bridge. A devout Catholic, he goes to mass every day, wherever he is.

As every Administration official does, Mr. Volpe knows there is a time limit on his Washington years. He keeps it in mind.

"We've got to double our transportation capacity in the next 20 years," he says. "Think of that. In 20 years we've got to match all of history. When I get through, I'd like to feel I have developed a balanced transportation system. America is going to grow, we know that. But the way it grows is what's important. And transportation will determine in a big way where we are at the end of the decade."

---

## SALVATION: IT IS POSSIBLE

Mr. MONDALE. Mr. President, one of the most interesting articles that I have read recently on the environmental crisis is one written by Barry Commoner in the April 1970 issue of the Progressive.

The entire issue, entitled the "Crisis of Survival," is devoted to the subject of the environment and is worth reading.

The article by Commoner, who has been referred to as the "Paul Revere of Ecology," is especially incisive and thoughtful. Commoner makes a strong case for the fact that our environmental problems have been the direct result of our use of technology as the basis of increased production and high financial return.

Commoner states that "the continued success of our economic system and the stability of the political framework which supports it" depends on our ability to take into account the hidden social costs of new technologies as well as simple profit and loss considerations.

There is a very real danger that if we allow unrestrained technological change for a competitive financial return at the expense of the integrity of the natural ecological system, we will become hooked on items such as inorganic fertilizers and synthetic insecticides.

As serious as thing are, Commoner sees the seventies as a period of grace:

> A decade which must be used for a vast pilot program to guide the coming reconstruction of the nation's system of productivity.

Mr. President, I commend the article to the attention of the Senate and ask unanimous consent that it be printed in the RECORD.

There being no objection, the article was ordered to be printed in the RECORD, as follows:

### SALVATION: IT'S POSSIBLE

(By Barry Commoner)

(NOTE.—Barry Commoner is director of the Center for the Biology of Natural Systems at Washington University. He wrote "Science and Survival," available in Viking Compass paperback.)

With startling suddenness environmental pollution has jumped to the top of the agenda of public concern. A short time ago the condition of the environment was largely a subject for discussion among scientists; although some of us did venture from our laboratories to alert the public and legislators to the problem, until recently the response was one of polite attention, but little demand for remedial action. Now, suddenly, things are different: Environmental pollution is a major public concern.

The immediate reasons for this concern are not difficult to detect, for they assail our senses every day: Our eyes smart with smog; our ears throb with the noise of automobiles, aircraft, and construction tools; we are assailed by the odors of polluted waters and the sight of mounting heaps of rubbish.

Less apparent than the *fact* of pollution is what can be done about it. The problems are enormous in size: Cities are running out of places to dump garbage, and a lake as large as Erie has been nearly totally polluted. The problems are bewildering in their complexity: If we expand sewage treatment facilities, the effluent nourishes aquatic plants and we only intensify the pollution caused by rotting masses of algae; if we incinerate garbage, we intensify air pollution; if we attempt to control smog by means of exhaust devices which reduce waste fuel emission, we worsen the pollution caused by nitrogen oxides.

The degradation of the environment in which we live has become a pervasive, intractable, discouraging problem. It clashes noisomely with the magnificent progress of the age, with the marvelous competence of our new machines, with the rising productivity of our factories and our farms, with the new inventions that have revolutionized communications and management.

Why has a society which is so enriched by the progress of technology now become so impoverished in the quality of the life which that technology supports? What are the causes of this dismaying phenomenon? What lessons can be learned from the environmental crisis that might help us survive it?

Consider this thesis, which, I believe, may provide some useful insights into these problems:

Environmental pollution is not to be regarded as an unfortunate, but incidental, by-product of the growth of population, the intensification of production, or of technological progress. It is, rather, an intrinsic feature of the very technology which we have developed to enhance productivity.

Our technology is enormously successful in producing material goods, but too often is disastrously incompatible with the natural environmental systems that support not only human life, but technology itself. Moreover, these technologies are now so massively embedded in our system of industrial and agricultural production that any effort to make them conform to the demands of the environment will involve serious economic dislocations. If, as I believe, pollution is a sign of major incompatabilities between our system of productivity and the environmental system that supports it, then, if we are to survive, it is the productivity system that must yield first place to environmental preservation, however severe and challenging to our social concepts that revised priority may be.

All living things, including man, and all human activities on the surfaces of the earth, including all of our technology, industry, and agriculture, are dependent on the great interwoven cyclical processes followed by the four elements that make up the major portion of living things and the environment: carbon, oxygen, hydrogen, and nitrogen.

All of these cycles are driven by the action of living things: Green plants convert carbon dioxide into food, fiber, and fuel; at the same time they produce oxygen, so that the total oxygen supply in our atmosphere is the product of plant activity. Plants also convert inorganic nitrogen into protein, a critical foodstuff. Animals, basically, live on plant-produced food; in turn they regenerate the inorganic materials—carbon dioxide nitrates, and phosphates—which must support plant life. Also involved are myriads of microorganisms in the soil and water.

Altogether, this vast web of biological interactions generates the very physical system in which we live: the soil and the air. They maintain the purity of surface waters and by governing the movement of water in the soil and its evaporation into the air regulate the weather. This is the environment. It is a place created by living things, maintained by living things, and through the marvelous reciprocities of biological evolution is essential to the support of living things.

The environment makes up a huge, enormously complex living machine—the ecosphere—and on the integrity and proper functioning of that machine depends every human activity, including technology. Without the photosynthetic activity of green plants there would be no oxygen for our smelters and furnaces, let alone to support human and animal life. Without the action of plants and animals in aquatic systems, we can have no pure water to supply agriculture, industry, and the cities. Without the biological processes that have gone on in the soil for thousands of years, we would have neither food crops, oil, nor coal. This machine is our biological capital, the basic apparatus on which our total productivity depends. If we destroy it, our most advanced technology will come to naught, and any economic and political system which depends on it will founder. Yet, the major threat to the integrity of this biological capital is technology itself.

One example is the fact that much of our present water pollution problem is not caused by inadequate utilization of the present technology of sewage disposal, but rather the very success of that technology. Present sewage treatment procedures were designed to relieve the burden of organic wastes on the self-purifying biological system of surface waters, by converting these wastes to supposedly innocuous inorganic products, such as nitrate and phosphate. This sewage treatment system is quite successful in achieving its aim. The system is failing, however, because its inorganic products are themselves reconverted to organic materials by the green plants that participate in the aquatic biological system, thereby frustrating the initial aim of the treatment process. This accounts for much of the mass of rotting algae which fouls the water and beaches of Lake Erie.

To make present sewage treatment technology ecologically sound will require, at the least, the introduction of tertiary treatment stages to protect the ecosystem of surface waters (almost no plants of this type are now in operation), and ultimately, a wholly new type of system that returns organic waste to the soil so as to protect the declining quality of our soils. Much of the modern pollution problems derives from the effects of phosphates on algal overgrowths, and nearly all of the phosphate enters surface waters from municipal sewage treatment plants because of the widespread use of phosphate-rich detergents. For that reason, we must add to the cost of rolling back water pollution the economic consequences of remaking the detergent industry, so that phosphate can be eliminated from its products.

Another example of new problems created by what seem to be technological achievements is provided by modern agricultural technology, which is largely based on replacing the dwindling natural supply of plant nutrients in the soil by the massive use of inorganic fertilizers, especially nitrogen. These fertilizers greatly increase the immediate crop yields; but at the same time, the impoverishment of soil organic matter, by alterning the physical character of the soil (especially its porosity to oxygen), sharply reduces the efficiency with which the added fertilizer is taken up by the crop.

As a result, unused nitrogen fertilizer drains out of the soil into rivers and lakes, where it joins with the nitrate imposed on the water by the effluent of sewage treatment plants, causing overgrowths of green plants and the resultant organic pollution. The drainage of nitrogen from fertilizer has already destroyed the self-purifying capability of nearly every river in Illinois, and the same process is at work in many other parts of the nation. In the Midwest and California, fertilizer drainage has raised the nitrate level of drinking water supplies above the safe limit recommended by public health authorities.

A third example which is—surprisingly—closely related to the previous ones is the matter of air pollution caused by automotive exhaust fumes. This problem originates with the production of nitrogen oxides by gasoline engines. Released to the air, these oxides, upon absorption of sunlight, react with waste hydrocarbon fuel to produce the noxious constituents of smog. This problem is the direct outcome of the technological *improvement* of gasoline engines: the development of the modern high-compression engine. Such engines operate at higher temperatures than older ones; at these elevated temperatures the oxygen and nitrogen of the air taken into the engine tend to combine rapidly, with the resultant production of nitrogen oxides.

The present smog control technique—reduction of waste fuel emission—by diminishing the interaction of nitrogen oxides with hydrocarbon wastes, enhances the level of airborne nitrogen oxides, which are themselves toxic. In the air nitrogen oxides are readily converted to nitrates, which are then brought down by rain and snow to the land and surface waters. There they add to the growing burden of nitrogen fertilizer. What is surprising is the amount of nitrogen oxides that are generated by our automotive traffic: They account for more than one-third of the nitrogen contained in the fertilizer currently employed on U.S. farms.

As a final example of the intrinsic failure of a technology which bears a considerable responsibility for the present pollution of the environment, look at the current status of the insecticide problem. Recent reports from Asia, Africa, and Latin America show that, with awesome regularity, major outbreaks of insect pests have been *induced* by use of modern contact-killing insecticides, because such insecticides kill the natural predator and parasitic insects which ordinarily keep the spread of insect pests under control. At the same time there is now increasing evidence that synthetic insecticides are responsible for declining populations of birds and fish. Because of such hazards, and the still poorly understood danger to man, DDT is being withdrawn from most of its uses.

I have cited these examples to illustrate the point that major problems of environmental pollution arise, not out of some minor inadequacies in our new technologies—but because of the very success of these technologies in accomplishing their designed aims. A modern sewage treatment plant causes algal overgrowths and resultant pollution *because* it produces, as it is designed to do, so much plant nutrient in its effluent. Modern, highly concentrated, nitrogen fertilizers result in the drainage of nitrate pollutants into streams and lakes just *because* they succeed in the aim of raising the nutrient level of the soil. The modern high-compression gasoline engine contributes to smog and nitrate pollution *because* it successfully meets its design criterion—the development of a high level of power. Modern synthetic insecticides kill birds, fish, and useful insects just *because* they are successful in being absorbed by insects, and killing them, as they are intended to do.

This raises an important question about new technology: Does it pay? Whether we ask this question in the direct language of profit and loss, or in the more abstract language of social welfare, the question is crucial. For, sooner or later, every human endeavor—if it is to continue—must pass this simple test: Is it worth what it costs? On the answer to this question depends the continued success of our economic system and the stability of the political framework which supports it.

It might appear that this question has already been answered. After all, power companies are eager to build plants for nuclear fuels rather than fossil ones; farmers rapidly adopt new insecticides, fertilizers, and machines. Apparently their cost accounting tells them that the new technologies yield the best available margin between income and costs. I should like to suggest, however, that these calculations are not complete—that certain costs have not yet been taken into account.

For example, what are the true costs of operating a coal-fired power plant in an urban area? The obvious costs—capital outlay, maintenance, operating costs, taxes—are well known. These costs are always less than the income derived from selling the power, given the requirements of our system of investment. But we have recently discovered that there are other costs and have even begun to put a dollar value upon them.

We now know that a coal-burning power plant produces not only electricity, but also a number of less desirable things: smoke and soot, oxides of sulfur and nitrogen, carbon dioxide, a variety of organic compounds, and dissipated heat. Each of these is a *non*-good and costs someone something. Smoke and soot increase the householder's laundry and cleaning bills; oxides of sulfur increase the cost of building maintenance; for organic pollutants we pay the price—not only in dollars, but in human anguish—of some number of cases of lung cancer.

Some of these costs can be converted to dollar values. The U.S. Public Health Service estimates the overall cost of air pollution at about $60 per person per year. A reasonable assessment of the portion of the $60 cost caused by power production from fossil fuels is about $20. This means that we must add to the cost of such power production for each urban family of four, about $80 per year—an appreciable sum relative to the annual bill for electricity.

The point of this calculation is obvious: The *hidden* costs of power production, such as air pollution, are *social* costs; they are met, not by a single producer, by many *consumers*. To discover the true cost of electric power we need to look for, and evaluate, all the hidden, social costs represented by environmental pollution—the dirty linen, so to speak. When we discover these hidden costs, we find that they degrade the biological capital—pure air—on which the lives and livelihood of the people depend.

We cannot escape from a profound truth of modern technology—for all its goods, we pay *some* price in hidden costs. These costs are a serious challenge to the social value of our new technology and the economic system which is based upon it. For the economic consequences of the hidden costs of environmental pollution attributable to modern technology are not trivial. It has been calculated that if the U.S. paper industry were required to meet present water-pollution standards, the industry would need to spend $100 million for each of ten years. The total profit in the paper industry is $300 million per year, so that, as a minimum, the bill represented by the pollution caused by the paper industry, if paid, would reduce the industry's profit by one-third for ten years.

The total cost of bringing water pollution control up to present standards has been calculated at $100 billion over the next ten to twenty years. The total economic loss from air pollution has been estimated at $11 billion annually. These sums loom large in the national budget. More important, for certain industries they may represent amounts which are so large relative to their profits as to constitute a serious threat to an industry's stability—if it were required to pay the full bill for the hidden costs of operation.

Environmental pollution represents a major social cost incident to the operation of our productive enterprises, a cost arising from the nature of the technology on which these enterprises are based. How, then, can we account for this pervasive relationship between technology and pollution? One answer to this question is that at least some of the environmental failures which are so characteristic of modern technologies are the end result of a response to economic pressure.

Let me illustrate this point by a fairly simple, but enlightening, example. For many years, dairy farming in the state of New York has been based on a particular breed, the Holstein cow. This animal was well suited to the small-scale irregular terrain of the local pastures. It efficiently grazed these fields, producing a direct economic return in the form of milk. At the same time, the Holstein cow helped considerably to maintain the capital investment represented by the farmer's pasture land, for its wastes contributed to the organic content of the pasture soil, maintaining its fertility in a natural manner. In such soil, soluble soil nutrients, such as nitrates, retain their naturally low levels and drainage of excess nitrate does not sufficiently stress the biological cycle of surface waters to cause water pollution. This is an ecologically balanced system capable of maintaining, indefinitely, a given level of productivity in the form of milk, and exacting little or no social cost in the form of pollution.

However, the rate of economic return from this system of dairying is low, relative to competitive forms of investment of the land and capital involved. Naturally the farmers were interested in ways of increasing the direct financial return from their dairy operations. This has taken the form of scientific efforts to breed a new strain of Holstein, capable of increased yields of milk per unit of feed. These efforts have met with success, and New York dairies now have available to them such high-yield Holstein breeds. As it happens, however, genetic selection for milk yield appears to be closely linked to the size of the animal. As a result, the new Holstein breeds are not only more productive, they are also considerably larger and heavier than their forebears.

For evident reasons, a large, heavy cow is not as agile as a smaller one, and farmers find that the new Holstein cows, unlike the original breed, are not as good at negotiating their hilly pastures—and are therefore unable, in that environment, to obtain sufficient nutrition by their own efforts. This biological difficulty can be solved—by an *economically* acceptable solution—by bringing the feed to the cow, which is then confined to a feedlot where its clumsy weight is no longer a handicap.

Thus, the Holstein has become, in effect, a kind of highly productive milk machine. But this machine, like other forms of technology, breaks the natural cycle of environmental processes. For now the cow no longer deposits its waste usefully over the pastures, but drops it instead in a restricted feedlot. Here, the waste constituents, such as nitrogen, can no longer become naturally incorporated into the soil. Instead, they overburden the soil's assimilatory capacity and nearly all of the nitrogenous material leaches through the soil into surface waters—where it becomes a pollutant.

At the same time, the pasture lands, now deprived of the organic matter of the cows' wastes, begin to decline in their fertility. Their productivity can be maintained by using inorganic fertilizer, which is now so cheap and easily spread as to compete favorably with manure. But, as already indicated, while this expedient is an effective way to maintain the immediate productivity of the land, it does so at the expense of a major *social* cost—added pollution of surface waters.

This example, though small in its scale, clearly shows how a technological change motivated by the demand for competitive financial return may succeed in this aim—but at the expense of the integrity of the natural environmental system—with the resultant generation of new *social* costs, in the form of pollution.

A livestock animal produces much more waste than human beings, and the waste produced by domestic animals in the United States is about ten times that produced by the human population. Much of this waste production is confined to feedlots—in 1966 more than ten million cattle were maintained in feedlots before slaughter, an increase of sixty-six per cent over the preceding eight years. This represents about one-half of the total U.S. cattle population. Because of the development of feedlot techniques—much of it in the Midwest—the United States is confronted with a huge waste disposal problem, one considerably greater than the human sewage which we are attempting to handle with grossly inadequate treatment. The result is predictable—massive, still unresolved, pollution problems exists, especially in the surface waters of the Midwest.

As a necessary concomitant to this development, the United States has been forced to adopt, on an equally massive scale, chemical fertilization of the land, which is now deprived of the natural organic fertility of the animal wastes produced by cattle that once browsed on farmlands. In the period 1945–1968, the use of nitrogen fertilizer in the United States increased about fourteenfold. This vast change has occurred for sound economic reasons. Since 1945 the cost of farm labor, land, and machinery has risen about fifty to sixty per cent; but in that time the cost of fertilizer has *declined* about twenty-five per cent. Moreover, intensive use of fertilizer, especially of nitrogen, provides a quick return on the farmer's investment; a fertilizer investment made in the spring is quickly reflected in the return from the crop in the fall.

I have emphasized these agricultural problems because they most directly reveal our dependence on the natural systems which constitute the environment. These examples also show explicitly that environmental pollution is caused by the violation of the integrity of natural environmental systems and illustrate the seriousness of the immediate social costs of the resultant pollution. However, these agricultural problems also illustrate a much graver consequence of technological intrusions on the environment—a threat to the very survival of the biological systems which sustain us.

For example, one consequence of our increasing dependence on the massive use of inorganic nitrogen fertilizer may be the loss, perhaps irretrievably, of certain species of soil microorganisms which in nature sustain the fertility of the soil by converting the nitrogen of the air to soil-organic nitrogen. If this should happen, any effort to restore the dwindling organic content of the soil and return to a balanced soil-water system will become difficult, and in some areas, impossible. We would then be *forced* into increasing dependence on inorganic fertilizer, with its attendant water pollution; like a drug addict, we would be "hooked" on a continued self-destructive course.

We face a similar crisis in the control of insects. It has become increasingly clear that we will soon need to abandon our reliance on synthetic insecticides and restore the natural control of insect pests by their insect enemies. However, as the massive use of persistent insecticides—such as DDT—continues, some species of these useful insects may face extinction, so that biological control may be difficult, and perhaps impossible, to reestablish. We would then be forced to rely on synthetic insecticides—and be "hooked" on them.

In each of these examples it is evident that we have been driven to disrupt the integrity of the natural environment under the impetus of demands for competitive economic returns from a given productive process. And in each case, the new technology has not, in fact, yielded an unequivocal improvement in the ratio of productivity to cost of production because of the pervasive social cost of the resultant environmental disruption: pollution and, perhaps ultimately, our very survival.

These examples reflect a faith, now common in our society, that a technological advance which results in an improvement in the yield of a particular desired product is an undiluted social good. In a sense, this faith is justified. The modern automobile, or the nuclear reactor, is indeed a technological triumph. In each is embodied the enormous insights of modern physics and chemistry, and the exquisite skills of metallurgy, electronics, and engineering.

Our success is in the construction of these machines; our failure is in their operation. For, once the automobile is allowed out of the factory, and into the environment, it is transformed. It then reveals itself as an agent which has rendered urban air carcinogenic, burdened human bodies with nearly toxic levels of carbon monoxide and lead, embedded pathogenic particles of asbestos in human lungs, and contributed significantly to the nitrate pollution of surface waters. Similarly, the design and construction of a nuclear reactor epitomize all the skills of modern science and technology. However, once it begins to operate, it threatens rivers and lakes with its heated waters and human bodies with radiation.

We have already paid a large price for such illusions. For the advantages of automotive transportation, we pay a price in smog-induced deterioration and disease; for the powerful effects of new insecticides, we pay a price in dwindling wildlife and unstable ecological systems; for nuclear power, we risk the biological hazards of radiation; by increasing agricultural production with feedlot operations and fertilizers, we worsen water pollution.

Because of our illusions we have become unwitting victims of environmental pollution. Most of the technological affronts to the environment were made not out of greed but ignorance. We produced the automobile that envelops our cities in smog—long before anyone understood its harmful effects on health. We synthesized and disseminated new insecticides—before anyone learned that they also kill birds and might be harmful to people. We produced synthetic detergents and put billions of pounds into our surface waters—before we realized that they would not be degraded in disposal systems and would pollute our water supplies. For a number of years we spread radioactive fallout across the globe—before we learned that the resulting biological risks made it too dangerous to continue. We have unwittingly killed thousands of sheep in testing our chemical weapons and have triggered unanticipated earthquakes with our nuclear tests.

We have, in sum, blindly assaulted the integrity of the environmental systems that support us, and unwittingly risked our very survival.

This is some of the tragic destruction that lies hidden in the changing environment—costs that do not appear as entries in the balance sheets of industry and agriculture. These are some of the great debts which must be paid if the environment is to be saved from ultimate destruction. The debts are so embedded in every feature of the economy that it is almost impossible to calculate them.

What can we do to avert the environmental crisis?

I have tried to describe the nature of the environmental crisis, and to illuminate, from what we now know, its fundamental causes. In brief, we are in a crisis of *survival;* for environmental pollution is a signal that the ecological systems on which we depend for our life and our livelihood have begun to break down and are approaching the point of no return.

My own estimate is that if we are to avoid environmental catastrophe by the 1980s we will need to begin the vast process of correcting the *fundamental* incompatibilities of major technologies with the demands of the ecosystem. This means that we will need to put into operation essentially emissionless versions of automotive vehicles, power plants, refineries, steel mills, and chemical plants. Agricultural technology will need to find ways of sustaining productivity without breaking down the natural soil cycle, or disrupting the natural control of destructive insects. Sewage and garbage treatment plants will need to be designed to return organic waste to the soil, where, in nature, it belongs. Vegetation will need to be massively reintroduced into urban areas. Housing and urban sanitary facilities will need to be drastically improved. All of these will demand serious economic adjustments, and our economic and social system will need to be prepared to make them.

I believe that we have, as of now, a single decade in which to design the fundamental changes in technology that we must put into effect in the 1980s—if we are to survive. We will need to seize on the decade of the 1970s as a period of grace—a decade which must be used for a vast pilot program to guide the coming reconstruction of the nation's system of productivity. This, I believe, is the urgency of the environmental crisis—we must determine, now, to develop, in the next decade, the new means of our salvation.

I was proud, and moved, recently to be termed "The Paul Revere of Ecology." To extend the metaphor a bit, what should we expect of President Nixon if he hopes to become the nation's first eco-President, or, if you like, "The George Washington of Ecology"?

The nation has been told by President Nixon that: "Through years of carelessness we incurred a debt to nature, and now that debt is being called." Here are some of the ecologically urgent actions that are within his power, as President, to take:

One—He can announce to the nation that we are, now, in a fight for environmental survival and declare a state of national ecological emergency.

Two—He can act to enable the scientific community to take the first steps toward environmental survival by releasing it from the paralyzing effects of the most severe cutbacks in research support in twenty-five years.

Three—He can find the immediate means to devote Federal resources to a simple, yet enormously meaningful, program: Let us declare that every piece of land not in actual use by its owners must be returned, until otherwise needed, to grass and trees; let us find the means to remove the abandoned buildings and junk piles from blighted city streets and restore the latter to nature's green.

Four—He can, in the name of ecological sanity, halt the development of the supersonic transport (SST)—an environmental horror which, if it is ever flown in the nation's airlanes, will expose a fourth of the nation to noise equivalent to that which surrounds our airports.

Five—He can avert the impending $250 million appropriation for the construction of the Florida Barge Canal, a project which in the considered opinion of ecologists will do more harm to the welfare of the state than any possible commercial value that it might yield.

Six—He can call a halt to the exploitation of oil deposits in Alaska, until the project devises—if it can—methods of drilling and transport that do not risk the future of the delicately balanced ecosystem of our—and Canadian—arctic territories. He can also hold in abeyance the further exploitation of offshore oil in California and elsewhere until the ecological risks are effectively mastered.

Seven—He can stop the war in Vietnam and halt the barbaric destruction of the ecological resources of that unfortunate land, not only by unprecedented destruction of its vegetation with weed killers, but the destruction of the land itself and of its people by the needless horror of war.

Eight—He can declare to the world what we in the scientific community have long known—that modern warfare, with its nuclear, chemical, and biological weapons—is totally incompatible with the continued life of mankind and take steps toward the permanent dismantling of the war machine that holds the whole world in terror.

These immediate actions, and the long-term massive effort to roll back pollution at its roots, amount to a wholesale reorganization of our national priorities. But if we are staggered by the magnitude and gravity of these undertakings, let us remember that we have indeed "incurred a debt to nature," a debt which must be paid if we are to survive.

The environmental crisis is a grim challenge. It also is a great opportunity. From it we may yet learn that the proper use of science is not to conquer nature, but to live in it. We may yet learn that to save ourselves we must save the world that is our habitat. We may yet discover how to devote the wisdom of science and the power of technology to the welfare, the very survival, of man.

## AIR SERVICE TO SMALL COMMUNITIES

Mr. CANNON. Mr. President, beginning Friday, April 10, the Aviation Subcommittee of the Committee on Commerce will engage in a series of field hearings to look into the adequacy of scheduled air service to our smaller communities. It may be that our Western States suffer the most in this regard, but I am sure the problem is widespread.

I suspect the beginning of this problem was when the trunks shifted to jets, and dropped from their routes some of the smaller of our cities. These were inherited by our local service carriers, but when this group started to bring their jets into service, the same process started all over. I think we will find some of these stops must now rely on air taxi service.

The subcommittee plans to hold hearings in Montana, Utah, Nevada, Kansas, Washington, New England, and the District of Columbia.

We will be studying the local service carrier, the commuter carrier, and the air taxi, and we will take a look at the subsidy plans of the CAB.

But the basic responsibility for providing service to our smaller cities lies with the nine regional local service carriers who have been providing this service for more than 20 years, with the support of subsidy payments from the Federal Government. Airline service to these cities costs a great deal more than the carriers receive in revenues from passengers, mail, and freight.

Prior to 1967, these carriers were provided with sufficient subsidy payments to enable them to achieve profitable operations. Since then, however, they have sustained tremendous operating losses as a result of increasing operating costs and declining subsidy payments.

The nine regional local service carriers sustained a net loss of $48.5 million in 1969; this is on top of losses of $28 million in 1968 and $4.3 million in 1967. These losses over the past 3 years have completely eliminated the accumulated earnings of the regional carriers, leaving them with a combined earnings deficit of approximately $50 million after more than 20 years of public service. These are shocking figures when it is remembered that the Civil Aeronautics Board has determined that carriers of this class need to earn a profit of more than 8 percent per year on their investment in order to continue as a sound economic enterprise.

The reasons for this extraordinary situation are complicated and diverse. The first cause was the determination by the Civil Aeronautics Board in 1966 that the regional carriers should be able to withstand major subsidy reductions as their revenues increased—hence a subsidy reduction program was adopted which resulted in automatic subsidy reductions as revenues did increase. This program resulted in a reduction in subsidy payments from $72 million in the fiscal year 1966 to $48 million in fiscal 1969 with a further reduction due in the current fiscal year, although the CAB is now considering freezing the present level of payments for 1 year.

Ironically, the local carriers' cost increased at this time for several reasons, the most important being the sharp increase in operating costs which followed the 1966 airline strike. This inflationary spiral has continued unabated since 1966.

Also there was a general decline in traffic growth at smaller cities resulting partially from the trend of migration to the larger cities and from the loss of traffic due to an improved highway system.

Another factor affecting the local carriers was their acquisition of jet aircraft and their entry into longer haul markets. These, given time, have obvious profit potential. I am afraid, however, that the route expansion program of the CAB, while sound in principle, failed to recognize the time required to develop new routes and the impact of increased operating costs resulting from steady inflation.

These developments have placed our local service carriers in a critical position. Generally they have tried to endure this burden of deficit operations in hopes that their new routes would develop to the point where they could operate under the reduced subsidy levels produced by the current subsidy formula.

Many of my colleagues have received complaints from communities in their States about the deterioration of local airline service. It is not surprising, however, that a group of nine carriers which is sustaining a loss of $48.5 million per year is unable to provide the same quality of service as it once provided when they were making a reasonable profit on their operations.

Moreover, it is reasonably clear that a continuation of this drain on the carriers' financial resources will inevitably cripple their ability to provide improved local service in the future.

The question whether the present local carriers should continue to be required to serve very small cities or cities which have reasonably close proximity to other larger air terminals is one which deserves careful evaluation. There is also the question whether this service can be more economically provided by the so-called third level commuter carriers operating smaller aircraft with perhaps some assistance from the Government.

The regional local service airline industry of this Nation is an invaluable asset to our national transportation system and we must preserve it. After these hearings, the Aviation Subcommittee will be able to suggest to the Committee on Commerce what we think should be done to preserve this invaluable asset to our transportation system.

## UNITED AIR LINES RESERVATION CENTER

Mr. ALLOTT. Mr. President, last week, United Air Lines announced the selection of Denver as a national headquarters for a $5.2 million electronics reservation system. The 200 additional employees to be hired at this center will create an annual payroll of between $3 and $4 million. It will increase United Air Lines total employment in the Denver area to more than 3,000 with wage earnings of nearly $40 million annually.

This further step by United is a vote of confidence in Denver and Colorado. We in Colorado have had only the finest of relations with United over the years, and we are obviously delighted at this decision to expand United's commitment in our State.

Once again, we salute United and welcome this new addition to a growing family of services which United is offering the people of America through its facilities in Colorado.

Mr. President, I ask unanimous consent that the text of an announcement made in Denver on April 2 regarding a reservations center be printed in the RECORD.

There being no objection, the announcement was ordered to be printed in the RECORD, as follows:

### UNITED AIR LINES NEW NATIONAL RESERVATION CENTER

Selection of Denver as headquarters for a nationwide electronics reservations system which United Air Lines has under development was disclosed today (April 2), by G. E. Keck, President.

Keck simultaneously announced acquisition of a 6.5 acre site in the Denver Technological Center where the company's national reservations center will be built. The $5.2 million complex housing computers and related equipment will be completed this fall.

"Geographic advantages and availability of qualified personnel pointed to Denver as the logical choice", Keck said. "The local concentration of communications facilities also was an important factor and of course United's long association with the city was considered."

Keck said about 200 clerical workers, technicians and reservations specialists would be stationed at the Denver center. He estimated the annual payroll at $3 to $4 million. This would increase United's total employment in the Denver area to more than 3000 with a yearly payroll of almost $40 million.

The company's construction program calls