

IMAGE

POLLUTED AIR MONTAGE

SUPER TITLE:  
MAN BUILDS  
MAN DESTROYS

THE AIR WE BREATHE

HOSPITAL EQUIPMENT

DR. STEVEN AYERS  
ON CAMERA

AERIAL SHOT  
OF SMOKE

AYERS ON  
CAMERA

AUTOMOBILES

SOUND

(Sound of heavy breathing)

AYERS: VO

I think we know that the kinds of air pollution that we've been exposed to in the great cities of the country and of the world, are capable of producing damage.

We do know that air pollution at certain levels can injure human health. It can particularly injure the lungs and perhaps other body tissues.

The whole problem of air pollution, its health effects and its control is obviously extraordinarily complicated and I say that for the following reasons. We've identified the health effects of air pollution to a rather accurate degree. We really haven't done a very good job in control.

As man begins to create new by-products, these accumulate. The atmosphere is not infinite in terms of its diluting capacity. And as we pour more and more excrement into the atmosphere, subtle changes may occur.

There is good evidence that we have altered the atmosphere. I think that it is not irreversible and I think that we could reverse this by adequate control measures. The politics of air pollution are very much like the individual problems of avarice and gluttony. Now all of us do things that we consider bad habits that we like to do. We eat too much, we smoke too much, we may drive too rapidly. And air pollution is really a whole assortment of our bad habits that have caught up with us.

NARRATOR:

One of our worst habits certainly is over reliance on the automobile. In congested city streets, the

car provides notoriously inefficient transportation. But its effectiveness as an air polluter is something else again. Each gallon of gas consumed produces about 800 gallons of fumes. It is these auto emissions that combine with the sun's ultraviolet rays to produce smog, and the poisonous ozone that makes breathing so painful.

INTERSECTION  
WEST GERMANY

LICHEN

Contamination is also hard on plants. At a West German intersection these plants called lichen, discolor in direct proportion to the level of air pollution -- giving a highly accurate measurement of the state of the air.

GERMAN AUTO-  
EMISSION TEST  
STATION

But monitoring a problem is not solving it. The internal combustion engine continues to be responsible for 60 to 80% of air pollution in many cities and contributes to heart disease, respiratory ailments, and cancer. Perhaps its deadliest product is carbon monoxide which, even in small amounts, causes nausea, dizziness and impaired driver's judgment.

Alarmed over rising carbon monoxide emissions, some countries are enforcing strict standards. By just regulating the carburetor carefully, you can lower the carbon monoxide volume in an idling engine to 4.5%, the legal European limit.

AUTOMOBILE INDUSTRY

Some manufacturers are installing small computers in automobiles. These control emissions more accurately than carburetors by measuring out just the right mixture of air and fuel to the combustion chamber for a variety of speeds and road conditions.

JAPAN ROADSIDE  
AUTOMOBILE CHECKS

Elsewhere, as in Japan, spot road checks are a common sight. Cars exceeding acceptable standards must have an engine overhaul immediately. Today, in cities all over the world, invisible particles of lead from gasoline, rubber from tires and asbestos from brake linings have become part of the air we breathe.

In the United States, national Clean Air Acts have been passed by Congress. These also have had a strong effect on other nations competing for the American market. Yet as pollution per car declines, world auto production continues to soar, threatening any gains in pollution control.

JAPANESE AUTOMOBILE  
TESTING EQUIPMENT

The answer must come from research by all car makers into new power plants like gas turbines, steam engines, all-electric vehicles, or some combination of these.

But for the moment, auto pollution is far from solved.

ROBERT N. RICKLES  
ON CAMERA

RICKLES:

Automobiles and trucks remain a major problem, and I think they do in almost all of the world's capitals that are now turning towards automobiles. We, of course, have foisted the automobile on the rest of the world as a means of transportation and from everything I see, the rest of the world has bought that American dream. That will turn out to be a mistake, for a number of reasons, including air pollution.

The United States has taken a very strong position on the improvement of new automobiles. We require that in 1975 and 1976, all of the motor vehicles, gasoline powered motor vehicles, coming off the assembly line be 90 per cent cleaner than those that are coming off the assembly line in 1970.

AUTOMOBILES,  
NEW YORK CITY

RICKLES: VO

In New York, and in many U.S. cities, the major amount of driving in the critical areas, in the downtown business areas, are not done by private cars, despite what many people may think, but by commercially licensed cars, taxi cabs, trucks and buses. Those vehicles will be equipped with some form of control device, new control device, such as a catalytic converter, in the next several years or converted to a gaseous fuel, such as liquified petroleum gas.

MADISON AVE. MALL

Those will result in substantial improvements and clean emissions. In addition, there are plans here in New York for the creation of pedestrian malls, for the changing of traffic patterns, for the restriction of motor vehicles from certain parts of town, for the improvement of mass transit which is badly needed.

RICKLES ON CAMERA

Certainly there are a lot of vested interests against transfer funds from highway use to mass transit use. Obviously, all the people who sell gasoline, who sell cars, who sell concrete, sell steel are all in favor of more roads and less, or not so much, mass transit. But I think public opinion is swinging very much against them. And those forces are being mobilized and in the long run the government ends up proposing and implementing what

public opinion has dictated. So I think we will see a great deal more money spent in mass transit.

NARRATOR:

INDUSTRIAL SEQUENCE

The automobile is not the only villain. Refineries, mines, and rolling mills contribute to the millions of tons of particulates which yearly descend on industrial countries.

The heating of homes and office buildings produces its own pollution, as does the disposal of garbage in apartment house and city incinerators. The debris of conspicuous consumption is sometimes thought cheaper to burn openly than recycle.

That's a mistake in more ways than one.

Next to the car, the most acute polluters may be electric utilities, because fuels driving the turbines are often high in sulphur content and produce large quantities of poisonous sulphur dioxide.

Some environmentalists blame utilities for promoting the huge increases in power consumption since the second world war without regard for environmental consequences.

CHARLES F. LUCE  
ON CAMERA

Charles Luce, Board Chairman of New York's Consolidated Edison Company speaks of a dilemma we must face in the fight against pollution.

LUCE ON CAMERA

LUCE:

You cannot produce more electricity without causing some impact on the environment. At the same time, we can't improve the environment in any important respects without producing more electricity. For example, here in New York our biggest polluter is the automobile. If we are going to substitute mass transit or better mass transit or more mass transit than the automobile, we are going to have tremendous amounts of additional electricity.

Also here in New York now we are dumping, oh, 2 to 3 hundred million gallons of raw sewage a day in the Hudson River and East River, and when we have a good rain storm, we dump a billion gallons a day of raw sewage into these two bodies of water.

If we are going to treat that sewage as we are going to and we should, it is going to require very large amounts of electricity.

We have lots of wrecked cars in New York or cars that are abandoned by highways which should be recycled and that metal used over again. If we are going to do that, tremendous amounts of electricity both in the presses to compact these old auto wrecks and in the mills to reprocess the steel are going to be necessary.

First of all, I think it's necessary that as consumers all of us not waste electricity. Along this line, we here at Con Edison, about a year ago, decided to discontinue altogether our sales effort, even our off-peak sales efforts, and instead to substitute what we called our "Save a watt" programme, in which we urged our consumers to use the electricity that they needed for convenience and safety and comfort, but not to waste it.

And we suggested to our consumers that the same thing should be true of all forms of energy, not just electric energy. People shouldn't waste oil or gasoline or coal or any other form of energy.

And we have had some success with this programme. Last summer we think that it cut about 200,000 kilowatts off our peak load on the hottest

summer day. We think that it saved us many hundreds of millions of kilowatt hours of energy. This all had some ameliorating effect on the environment.

But, of course, this is not by itself enough. We have to do some other things too, we have to develop better technology for producing electricity with minimum impacts on the environment. I think, our industry must mount a much larger research and development effort than it ever has in the past.

NARRATOR:

SMOKESTACKS

Some research might be in order on the high stacks used by power plants. These increase the altitude at which pollutants enter the air, thus reducing their effect on people in the vicinity below.

But some scientists have different views about chimneys.

DR. VINCENT J. SCHAEFER  
ON CAMERA

SCHAEFER:

If we were to completely outlaw such chimneys, then the scientific and engineering community would be forced to find other solutions.

Now I personally believe that one of our major problems with air pollution is not in the big particles that have been quite successfully eliminated, but in the invisible, small particles.

It turns out that big particles have a very short lifetime in the atmosphere. They go up but then they fall back down very quickly.

It's the small particles that have an almost indefinite lifetime in the atmosphere. The only way they can be removed from the atmosphere is through precipitation. And in many parts of the country, that doesn't happen. So it just stays in the air. And the lifetime of these small particles can be a month or more. That means that a particle could go round the world, in that period of time. So if you eliminate vertical chimneys,

what I'm saying is that we eliminate the vertical ones and make them horizontal, maybe make them like pretzels or corkscrews or some other way, and at the same time, take advantage of the big particle fallout-- make particles grow even bigger and make them grow fast, and we know how to do that, so that the particle falls out.

And then we have endless belts perhaps, that take those fallen particles, take them to a reprocessing plant and recover the things that we are now putting into the atmosphere which are valuable.

That, I think, is one of the really important things of the recycling business.

NARRATOR:

SCHAEFER ON CAMERA

Lessening pollution particles in the air could be a very urgent health matter. Dr. Schaefer is especially concerned about their effect on the smoking population.

SCHAEFER:

I say that one of the dangers from cigarette smoking is when one smokes in a polluted atmosphere. Now, the reason for that is all the pollution particles, the visible as well as the submicroscopic, are forced by the smoker to pass through the hot zone of the cigarette, and in passing through this hot zone, all of these particulates, many of them, are vaporized and the lungs are now a giant test tube producing all kinds of new chemicals from the vapors of these exotic things that were breathed in.

And it could very well be that one of the troubles, now becoming almost epidemic, in terms of emphysema and such things, is much more related to that secondary effect, the synergistic reaction that goes on in the lungs when people smoke in polluted air.

ASBESTOS SEQUENCE  
CONSTRUCTION SITE

NARRATOR:

Human health, after all, is the main factor behind concern with air pollution. A frightening example is the link between cancer and asbestos. Sprayed on girders to fireproof new buildings, invisible particles of asbestos dust enter the lungs of construction workers. Among this group, inhalation over a very short period seems to produce deaths in excess of normal mortality rates years later. Alarmingly, almost every city dweller is thought to have some asbestos in his lungs.

DIRTY BUILDINGS

But mostly the air pollution threat is less dramatic. Evidence of its slow attack on our lives can be seen in the grime of buildings in our cities -- the soiling of clean washes -- even in the blighted vegetation of the cleaner countryside.

PLANTS

ELDERLY COUPLE

The people who bear the greatest burden are the elderly and infirm who's afflictions are aggravated by the effects of pollution on the heart and lungs.

METAL EROSION

Yet we cannot help but wonder what must be happening to all human organs if steel can show such disastrous changes as this through prolonged contact with the air.

DR. STEVEN AYERS  
ON CAMERA

AYERS:

The human lungs react in a very monotonous and stereotype fashion, and if coal dust is bad for an American's lungs, it is bad for a Bantu's lungs.

and bad for a Belgian's lungs. We have to capitalize on the various environmental situations and use these as study areas in which to predict overall health effects.

Great Britain, because of its terribly severe air pollution problem, has served as a real model for almost all researchers in all countries.

#### LONDON SMOG, 1952

AYERS: VO

The great air pollution disaster of 1952 really demonstrated that air pollution could kill as many as 4,000 people in several weeks. There was just no question about that data.

Now we've spent the subsequent 20 years trying to decide how that air pollution did that.

#### JAPANESE FOOTAGE

Japan is an excellent example of the relationship between growth, gross national product and air pollution. The Japanese have done a fantastic job in moving their economy on and it has moved at such a dizzy rate that the air pollution levels have sky-rocketed, and one can find in the very large cities of Japan a rather high incidence of respiratory disease.

#### AYERS ON CAMERA

I think the story of the servicemen, men who are stationed in Tokyo and Yokohama for several weeks, is quite illustrative. A reasonable percentage of these men may develop asthma or some kind of lung disease and once they are taken from that area, their asthma disappears. In fact, this has been given the term Tokyo-Yokohama Asthma. We have our own New Orleans asthma and we have New York City asthma too. I think I should emphasize that in our New York City hospitals, asthma and chronic bronchitis is an extremely common problem. Our emergency rooms are filled with patients who are wheezing and coughing up yellow, green, and pink sputum.

#### PATIENTS

AYERS: VO

Now we have always had a chronic bronchitis and we've always had pus in the lung in small numbers of patients. But now we see a great deal of this in our urban areas. The yellow, green and pink sputum means pus in the lung.

I think the only way the public can become aware of the real dangers of air pollution is to be constantly informed by the media, by educational

AYERS ON CAMERA

processes in general about its health effects. People want to be healthy and I think until very recently, everyone thought that all that was needed was perhaps a few tablets, a pill once in a while and good health was guaranteed.

We know now that adequate diet, adequate exercise, and a reasonably clean environment are absolutely necessary to have decent human health. If we can hammer that message home, that clean air means good health, and dirty air means bad health, we will have accomplished a great deal.

NARRATOR:

WEATHER

The world's weather is also affected by pollution in our cities.

Solar radiation and ultraviolet rays are cut down. Because of contaminated air, our cities are apt to have stronger rain falls than the surrounding countryside.

WIND TUNNEL MODEL

Weather, in turn, complicates pollution control. Models of the terrain around proposed industrial sites can accurately project all sorts of problems except one -- a sudden reversal of wind direction.

Yet basically weather is indispensable in keeping the earth a tolerable place to live in, as Dr. Vincent Schaefer explains.

SCHAEFER ON CAMERA

SCHAEFER:

One marvelous thing that happens as far as the weather is concerned, and the level of pollution in the atmosphere, is that it cleans up the atmosphere. It is the only way really that we have, that man has, to hope that we will not get in really serious trouble from pollution.

Because every snowstorm, every rain storm, every cloud cleans up the air. The air that moves into a cloud, containing particles, those particles are very rapidly gathered up in the cloud droplets. They in turn, produce rain drops, or snow crystals, and they in turn carry the pollution particles to the ground.

If it weren't for this cleansing mechanism, wash-out, rain-out, fall-out, we would have been in trouble a long time ago. And it is only when we begin to exceed the ability of natural methods, natural mechanisms to clean up the air, that we begin to get in trouble.

NARRATOR:

INVERSION

Weather's failure to clean the air isn't always due to our overloading the atmosphere with pollutants. Once in a while a freakish phenomenon called an inversion occurs.

SCHAEFER ON CAMERA

SCHAEFER:

Anyone with eyes can see that we have a very serious air pollution problem in most of our cities whenever we have stagnant air.

INVERSION FOOTAGE

Normally, you see the atmosphere is such that its unstable. The material from the city moves into the surroundings and is carried away. But with inversion everything is stable. Inversion is cold air capped with warm air. You just have a dome of warm air so that it traps everything below. Everything that is being exuded from the ground is just carried upward, but can't get away and consequently, is held there, builds up, and the concentration gets higher and higher until it gets very serious.

INVERSION ANIMATION

SCHAEFER ON CAMERA

The kind of thing that the general public, the individual, has to understand if he wants to make a contribution to eliminating or alleviating air pollution as well as other kinds of pollution, is first of all to become educated so he understands what the problem is. In the long run, we are the ones who have to make these decisions and our industrialists are merely in one sense, our servants. Just as a public official is one of our servants.

And I think that the sooner the general public of the world understands this, that we are all in this together, and that somehow or other we have to find a better way, then I think we will begin to solve some of the problems, and not until then.

NARRATOR:

EXTERIOR UNITED  
NATIONS BUILDING

Solving air pollution is obviously not just a local or a national problem. Maurice Strong, Secretary General of the United Nations Conference on the Human Environment:

MAURICE F. STRONG  
ON CAMERA

STRONG:

The air pollution problem has been recognized as an international problem really on two counts. One is that the problem is being experienced widely by almost every country with any degree of industrial activity at all, and two, because the problem is one which in the final analysis does create a risk for all mankind.

The levels of carbon dioxide in the atmosphere, for example, have been giving scientists increasing concern, because they have increased very substantially in recent times, and if present levels of industrial and combustion activity continue to prevail, the prospect is that there will be substantial increases in the carbon dioxide content of the atmosphere.

Nobody knows precisely what this will do, but what it does do is have a major effect on the filtering quality of the atmosphere and this, in turn, can effect the heat balance.

A lot of us forget that the whole existence of life on this planet earth is dependent on that very delicate balance between the amount of heat we receive from the sun and the amount that is reflected back into space, and that in turn is determined by the quality of the filter. And that filter is the earth's atmosphere. Therefore, if you change the chemical composition of a filter, you very materially change the heat balance.

Now some people are suggesting that this is going to cause an increase in the temperature of the earth, with a consequent melting of the ice caps, increase in the level of the oceans, which will flood a substantial amount of the world's coastal areas, and this, of course, would be disastrous.

On the other range are those who predict that the increase in particulate matter, in dust particles in the atmosphere, will offset this. Now the real answer is that nobody knows. But all scientists, wherever they may stand on this argument, do agree that today man's activity is creating greater changes in the composition of the atmosphere than have taken place through natural processes in hundreds of thousands of years of history, and that those activities do constitute a very real risk to the future of the human race.

And one of the primary tasks that the United Nations has to deal with and it is the only global organization that can deal with this problem on an overall basis, is to seek to achieve agreement among the governments concerned to adopt certain minimum standards. To adopt certain common practices. To agree on common bases even for conducting measurements.

SMOKESTACKS

STRONG: VO

The whole question of collective action on pollution control on a global basis is going to become one of the principal issues that nations are going to have to deal with. One of the principal issues in international affairs.

GIRL BREATHING

END CREDIT TITLES