WORLD VIEW

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Edited by Pete Ayrton, Tom Engelhardt and Vron Ware

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Publisher's Note

This year's *World View* shows marked differences from previous editions. Most contributions are original to the English-language edition, articles are arranged thematically rather than country by country and the book is shorter. In implementing these changes, we have responded to readers' requests for a more succinct, focussed work. The world table is an attempt to present statistical information in a way that goes beyond the mere collation of official figures. Articles translated from the French and German appear simultaneously in the yearbooks of La Découverte, the French, and Rowohlt, the German publisher. Pantheon, the US publisher of *World View*, commissioned the articles by American contributors.

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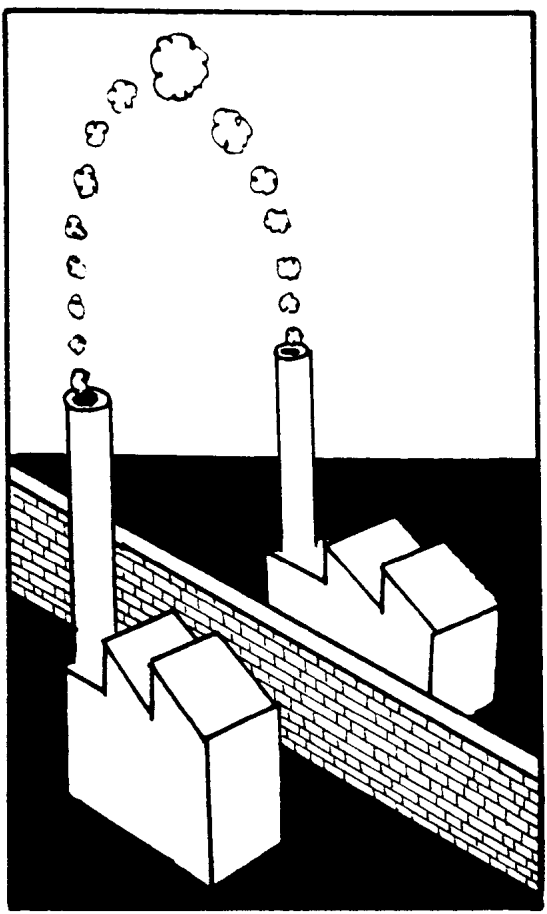

No Smoke Without Acid Rain

Acid rain is rapidly becoming the most important environmental issue of the 1980s. It is an invisible, all-pervasive form of air pollution currently threatening 5 to 10 million square kilometres of Europe and North America. It turns rivers, streams, and lakes acidic, killing fish and other water life. It changes the soil structure of forests so that thousands of square kilometres of trees are being destroyed. Acidic smog, one of its manifestations, has shortened the lives of people, and is at the moment suspected of having a continuous deleterious effect on human health. It assaults buildings and cultural artefacts with corrosion that costs millions of dollars in losses every year. It is, according to a statement made by the United Nations Environment Programme in June 1983, 'a particularly modern, post-industrial form of ruination, and is as widespread and careless of its victims, and of international boundaries, as the wind that disperses it'.

'Acid rain' is an umbrella term used to cover a variety of air pollutants, the bulk of which are produced by industries burning coal and oil. The combustion of either fuel releases sulphur and nitrogen into the air as sulphur dioxide (SO_2) and nitrogen oxides (NO_x). In the past, these two substances could be absorbed into the atmosphere and neutralized, but the enormous amounts of fossil fuels now consumed by the industrial nations means that this is no longer possible, and the result is an overload of pollution on an enormous scale. In 1982, for example, Europe produced approximately 40 million tonnes of airborne sulphur dioxide—the equivalent of 66,000 30-tonne lorries full of sulphur, dumped on the lakes and forests of Europe. Globally, there is a rough parity between naturally and artificially produced sulphur in the air: in the polluted airways of Europe and North America, 90 to 95 per cent of airborne sulphur is human-made. Annual production of sulphur and nitrogen oxides doubled in Europe between 1950 and 1970; it was in this period that the first serious symptoms of environmental acidification began to become apparent.

The term 'acid rain' is perhaps misleading because the SO_2 and NO_x can return to earth in a number of ways—often washed down in rain or snow, (a process known as wet deposition), but frequently as dust (dry deposition), or in sleet, hail, mist, fog or smog. Transformed by atmospheric processes into sulphates and nitrates, the two pollutants can drift for hundreds of kilometres before falling to the ground, combining with water to form weak sulphuric and nitric acid. The continuous and long-term injection of these disruptive substances into the ecosystems of Europe and North America has led to widespread environmental deterioration, with ecological consequences of unknown but potentially devastating dimensions.

The main producers of acid rain —electricity manufacturers burning millions of tonnes of coal and oil annually—are economically essential and politically powerful, with huge financial resources at their disposal. Their pollution is frequently connived at by governments for domestic reasons —the machinery needed to clean power station smoke would increase the cost of generating electricity, which would have an inflationary effect on the national economy—and because of the international aspects of acidification. Polluted emissions from the UK cause more damage in Scandinavia than in Britain (at the moment), and as such can be presented as a Norwegian and Swedish, rather than a British, problem. At stake are billions of dollars in emission cleaning costs, balanced against environmental deterioration which, although of an equivalent magnitude in cost (as

estimated in a 1981 OECD report), has the advantage of occurring in someone else's back yard.

The situation has been made easier for the polluting nations by the scientific complexity of the problem. Although the phrase 'acid rain' was coined in 1872, the link between air pollution and the increasing acidification of lakes was not established until 1964, when a Swedish scientist made the connection. His findings, and subsequent research, were presented to a UN Conference on the Environment in 1972, and sparked off a number of scientific projects. Eleven years and 3,000 experiments, surveys and studies later, North American and European interest in acid rain became so intense that through 1983 there were innumerable scientific conferences on the subject.

The results of all this scientific inquiry has been the establishment of some facts:

Acid rain is generally composed of 70 per cent sulphuric acid, and 30 per cent nitric. Sulphur dioxide, often in collaboration with other pollutants, has a corrosive effect on buildings. The rain has become significantly more acidic over Europe and North America over the last 30 years.

SO_2, NO_x and ozone, working together or separately, have a destabilizing effect on thin-soiled coniferous forestland, making it more vulnerable to disease or other external attack.

The central constituent of acid pollution—SO_2—is mainly produced by electricity utilities. Fifty per cent of NO_x is produced by power stations and industry, with the other half being created in traffic exhaust fumes.

On the other hand there is still uncertainty as to the exact mechanisms by which SO_2 and NO_x are transformed into acids in the atmosphere, the origin of certain pollutant episodes, and the relative contribution of SO_2 and ozone to the destruction of the forests. These uncertainties have been exploited by the polluting countries and industries, and have been used as an excuse for not moving to clean up industrial emissions.

The politics of acidification is dominated by geographical position. In 1982, five nations—the UK, France, Italy, Spain, and the Federal Republic of Germany—produced 75 per cent of western Europe's airborne sulphur dioxide. The first four countries, situated on the western or southern edges of Europe, can take advantage of the clean air brought in by the prevailing south-westerly winds, load it with polluted emissions, and send it further into Europe. It is no coincidence that these major exporters of pollution are singularly uninterested in control of emissions: the FRG was similarly unconcerned until the early 1980s, when it became apparent that large areas of the Black Forest were being killed by air pollution. In 1983, the West Germans announced a ten-year programme to reduce their pollutant emissions by 50 per cent, at a cost of between $2 and $5 billion.

Other countries are not going to take similar measures unless international or domestic pressure forces them to. They defend themselves by saying that more research into the problem is necessary before action can be taken. This is a political statement, however, rather than a true expression of scientific uncertainty, and there have been occasions when a government's international posture has been belied by actions taken at home. In 1982, for example, UK Junior Minister for the Environment Giles Shaw pleaded at the Stockholm Conference on the Acidification of the Environment for more information about acidification, ending his speech with a rhetorical flourish: 'How can we justify the additional costs, how can we justify the energy penalties of emission control on existing facilities, unless we can be sure of commensurate advantages?' What Shaw didn't mention in his speech was that the UK government had moved two months previously to cut the funding of the British research programme on acid rain. As a Scottish MP, Angus Lyon, remarked: 'The government's attitude is quite hypocritical. On the domestic front, they recently attempted to cut back severely on air pollution research. Internationally, they call for more research to prove that there is a problem.'

In North America, geography simi-

larly dominates the debate. The USA's industrial states, notably Ohio and Pennsylvania, produce a spume of airborne industrial effluent that follows the windcurrents up the eastern coast of the continent, poisoning the Adirondack Mountains area, Massachussetts, New York State, and Vermont, before continuing on into Canada.

The Canadians, alarmed by the fact that half the annual acidic input into their vulnerable lakeland areas originates from the USA, agreed with the Carter administration in 1980 to 'develop a bilateral agreement to combat transboundary air pollution'. Four working groups were set up to establish the nature of acidic damage and look at remedial strategies, but the arrival of the new Reagan government torpedoed the success of these talks. Subtle and not-so-subtle methods were used to frustrate the workings of the groups—US co-chairs were dismissed and appointed with bewildering rapidity, US scientists were told to ignore the terms of reference of the US–Canadian agreement, Washington blocked the publication of a damaging report for 12 months until the Canadians threatened to publish unilaterally. After two years of treading water, the two countries decided to publish separate statements about the conclusions of the negotiations, with Canadian scientists blaming US interference for the failure of the project.

With election time coming round, however, Reagan was alerted to the dangers of ignoring acid rain, and issued an instruction to his advisers not to let it become an electoral handicap. In September 1983 the USA moved towards a desulphurization policy; Environmental Protection Agency administrator Fitzhugh Green was hoping to unveil the new programme at an acid rain conference in West Germany, but was prevented from doing so by last-minute industrial pressure. He had to postpone the announcement, and was left standing on the stage at the conference apologizing for 'tap-dancing'. EPA director William Ruckelshaus later commented, presumably with some understatement, 'Members of the US cabinet . . . brought different perspectives to the issue.' The possibility remains of a desulphurization programme before the 1984 presidential election, but this is dependent upon political calculations of the merits of responding to the environmental or industrial lobbies.

The USA's tap-dancing is trifling compared to the quadrille being performed on the other side of the Atlantic. Throughout the 1970s, when Sweden and Norway were the only countries applying diplomatic pressure, there was not much urgency to the acid rain negotiations. Thirty-five nations signed a Convention on Long-Range Transboundary Air Pollution in November 1979, but this was no more than a bland statement of intent, and allowed the polluting countries the luxury of expressing concern without the responsibility of having to take action.

The West German turnaround, however, changed the face of the negotiations. In 1982 a German survey established that 8 per cent of the country's trees were being damaged by air pollution: by 1983, when the survey was more efficiently organized and co-ordinated, 34 per cent of woodland was found to be affected. By this time even pro-industry right-wingers such as Franz-Joseph Strauss of Bavaria were becoming alarmed. The Germans mounted a substantial diplomatic effort which culminated in a 1984 draft EEC directive requiring all member states to reduce their large-plant SO_2 emissions by 60 per cent within ten years.

The progress of this initiative can be assessed by comparing it with a June 1983 proposal at the United Nations Economic Commission for Europe for a 30 per cent reduction of sulphur emissions. Nine countries supported the suggestion—Sweden, Norway, Denmark, Finland, Austria, West Germany, Switzerland, the Netherlands and Canada—and the USSR agreed to a similar reduction in its sulphur exports, as opposed to its national output. In the absence of agreement from the main polluters, however, the proposal disappeared; a similar fate seems likely for the EEC move.

On the other hand, diplomatic pressure will change into a higher gear as the extent of the damage spreads.

The threat posed by acidification of the environment is that it is cumulative. The pollutant builds up over the years, degrading the soil structure of forests and changing the characteristics of surface waters. By the time the damage becomes apparent it is often too late to reverse the process and return the ecosystem to its original pristine condition. The spread of acidification can be mapped chronologically; starting with southern Scandinavia and spreading northwards, it then began to pockmark Central Europe and eastern North America, eventually blighting large areas of these two regions before stretching out to take in countries on the western edge of Europe and places further down the east coast of America. Geologically vulnerable areas are the first to deteriorate; this deterioration can be triggered off by relatively small doses of acidity. Mid Wales, for example, has the cleanest rain in northern Europe, but now some Welsh streams and lakes are unable to support fish life.

In 1981, the US National Research Council issued a report that said, 'At current rates of emission of sulphur and nitrogen oxides, the number of affected lakes can be expected to more than double by 1990, and to include larger and deeper lakes.' The spread of acid-damaged lakes is now observable on an annual basis; this, together with the growing awareness that remedial measures—when finally agreed—would take five to ten years to implement, has promoted acid pollution from an area of concern into an environmental crisis. The list of affected countries below is an indication of the current extent of acidification, but should not be regarded as a statement of the final effects of the pollution. This can only be assessed ten or fifteen years after industrial emissions have been cleaned up. In the meantime, the situation will certainly get worse.

Sweden: 18,000 lakes are becoming acidified, with 4,000 severely damaged and 9,000 more suffering loss of fish stocks. Fishing in more than 100 lakes has been banned because of mercury poisoning. Kidney patients have died because of polluted dialysis water, babies and infants have suffered diarrhoea and stomach upsets. Ten per cent of trees in the ten southernmost counties have been damaged. In a quarter of the country the majority of waters have reached unacceptable levels of acidity at some time of the year. Half a million private wells are in danger of being contaminated.

Norway: lakes in more than 5,000 square miles of Norway are now practically devoid of fish and, in another 7,500 square miles of lakeland, fish stocks are reduced. In the four southernmost counties more than half the total fish population has been lost in the last 40 years.

West Germany: 34 per cent of trees have been damaged by air pollution. In Bavaria, 46 per cent are damaged, in Baden-Württemberg, 49 per cent. A quarter of West Germany is forested, as compared to 7 per cent of Britain: the area of trees suffering medium to severe damage—700,000 hectares—is equivalent to three-quarters of the total woodland in England. Over 2,000 square miles of forest have been declared a 'totally devastated area'. If pollution continues at the present rate, most of the fir and spruce trees in the Black Forest will be dead by the 1990s. £13,000 million worth of trees have already been lost; 47,000 jobs in the German forestry and wood processing industry are at risk.

Yugoslavia: in the Yugoslavian part of the Erzgebirge, 1,900 square miles of woodland have perished since 1970 and 200 square miles are seriously affected.

Poland: more than 1,500 square miles of woodland have been damaged by acidification.

Czechoslovakia: in the Erz mountains of western Czechoslovakia, nearly 400 square miles of forest are already dead, where less than ten years ago healthy trees covered the mountainsides.

Greece: acid pollution has ravaged the buildings of the Acropolis, to such an extent that certain statues have had to be taken indoors and stored in conditioned nitrogen. The whole of Athens has been banned from using high-sulphur fuel oil.

USA: hundreds of lakes in the Adironadack region of New York State have diminished fish populations,

with over 200 now fishless. US National Wildlife Federation has estimated that 100,000 miles of streams and 20,000 lakes are at risk of being poisoned by acid rain. Overall, 38 to 81 per cent (depending on the precise area being measured) of the lakes and streams tested in the eastern US, and 13 to 48 per cent of midwestern lakes, fall in the category of 'moderately sensitive to acid rain' to 'already acidified'. The White House-appointed Acid Rain Peer Review Panel estimated in June 1983 that ozone was causing 5 per cent damage to the cash value of crops, with acid precipitation causing a similar amount. Economic impact of acid pollution in the east is estimated at $5 billion annually.

Canada: several hundred lakes are already dead, with 48,000 in Ontario under imminent threat. Thirty per cent of Nova Scotia's salmon industry is in danger of being wiped out. It is estimated that 5,000 Canadians die annually from acid pollution-related bronchial problems. In April 1983 the Canadian Minister of the Environment stated that 8 per cent of Canada's GNP was at risk from acid rain. Environment Canada, a prominent conservation organization, has said: 'Over the last few years we have observed a continuous degradation of the biological health of a large segment of the environment.'

United Kingdom: rain over large parts of the UK is acid; lake-deaths have occurred in Scotland (West Galloway) and mid Wales (Dyfed and Gwynnedd). The Welsh Water Authority is seriously worried that the whole of upland Wales from Snowdonia to Camarthen could be affected. The most acid rain in Europe occurred at Pitlochry, Scotland, in 1974.

Switzerland: 8 per cent of forests estimated as damaged by air pollution.

Austria: 120,000 hectares of forest destroyed: in some southern valleys, a third of the trees are dying.

Steve Elsworth

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The Ecological Boomerang

'If present trends continue, the world of the year 2000 will be even more overpopulated, ecologically even less stable, and be even more susceptible to breakdowns than the world in which we live today.' That is the sober conclusion of the 'Global 2000' report, which paints a future of ecological catastrophes. Huge forest losses, the drying out of once-fertile soils, shortages of drinking water, the world's oceans used as the refuse basins of unrestrained industrial production—that will be the inevitable climax to the creeping environmental destruction already under way. However, while millions of people have demonstrated against the threat to world peace in recent years, there is less awareness of ecological destruction. The unauthorized rubbish dumps of the 1950s and 1960s have been replaced by controlled ones, the poison waste is hidden from sight, the brown, polluted rivers seem cleaner, the old, dirty, stinking chimneys have given way to the new tall chimney stacks, which distribute waste gases over a wide area—all these appear as visible successes.

Much greater dangers remain: the pollution of rivers and seas by heavy metals and non-degradable organic compounds, the acidification of soils and their toxification by heavy metals, contaminated food, drinking water polluted by nitrates, and much more. But, when dangers arise from quantities of one-millionth of a gram, when heavy metals and nitrates are invisible molecules, when plutonium radiates and cancer appears only after a latent period of 20 years, the threat can be grasped only by scientific analysis, and reaches the awareness of only a few people.

This is characteristic of the development of ecological awareness in recent years. On the one side there are mostly younger people who have grown up in relative prosperity and who can anticipate the ecological catastrophe of the year 2000. On the other side there are mostly older people who, in the middle of the economic crisis, are more worried about the future of their own jobs than about the break down of some eco-system in 2000.

The pseudo-argument—ecology vs. jobs—has been refuted by every serious investigation, but persists in public opinion. One of the most important tasks of ecologists is to destroy this legend. Recent developments will help more than the strongest arguments. The creeping environmental destruction is showing its poison fangs, it is becoming palpable and visible. First there was the iceberg, then the Titanic.

The iceberg

Anyone who has seen pictures of the Erzgebirge (a forest and mountain region on the borders of the GDR and Czechoslovakia) must feel a shiver down the back. Dead trees, parched soil and a sinking water-table are the consequences of unrestricted air pollution—an ecological Hiroshima. It is the climax of a development which began decades ago, but whose visible effects are now arousing people all over central Europe: the forest is dying.

The trees sicken, first of all the firs, then the pines, then the deciduous trees. There are trees without needles, with deformed and discoloured needles, dying tree-tops, premature shedding. The damaged trees lack fine roots, they have stinking and rotting hearts, and are more vulnerable to vermin like the bark beetle. Light storms and snowfalls cause them to fall over like matchsticks.

The damage in West Germany has been thoroughly documented. In 1982 approximately 8 per cent (560,000 hectares) of the forest was sick, in 1983 35 per cent (2.5 million hectares). But these figures are out of date, since the forest is dying faster than the dead trees can be counted. The worst

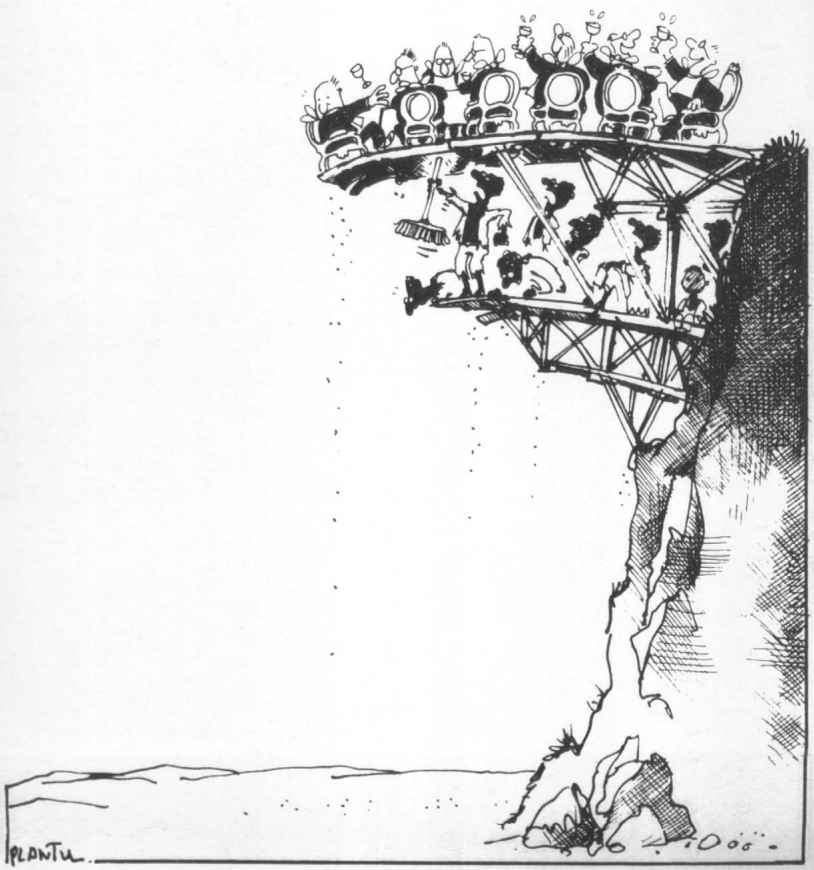
damage is reported from south Germany; in Baden-Württemberg and Bavaria half the forests are affected. In the Black Forest the fir tree is past saving. Even more horrifying than the scale of the losses is the dynamic of their increase. Within one year the destruction has quadrupled, and it seems that by 1984–85 the major part of West Germany's forest will be sick.

In Europe the most badly affected countries, apart from the Federal Republic are East Germany, Poland, Czechoslovakia and Yugoslavia, but there is also damage in Austria, France (the Vosges), Switzerland, Belgium (the Ardennes) and the Netherlands.

The principal causes for the forests dying are recognized to be the acidifiers, sulphur dioxide and nitrogen oxide—generally known as acid rain—released by burning coal and oil. Air pollution, or acid rain, is responsible for much more damage; it affects human health, especially that of children, and is suspected of causing cancer.

In Scandinavia, thousands of lakes are dying because of acid rain, and all over Europe there is immense damage to buildings and monuments: the Acropolis in Athens, the Colosseum in Rome, Cologne Cathedral, and St Paul's Cathedral in London. The damage to buildings and the death of the Scandinavian lakes have been well known for more than a decade, but without provoking any political response. In West Germany and elsewhere it was only when the forests began to die that the Scandinavian admonitions were heard.

The death of the forests mobilized public opinion and reached circles



that had previously been indifferent to creeping ecological destruction. The brown forest made some people green. In the Federal Republic some 700,000 people are directly affected: large and small forest owners, foresters and forestry workers, as well as the inhabitants of many small towns and spas, whose basis of existence is simply disappearing. But also affected are all those seeking rest and recreation and who saw in the forests a last refuge of undisturbed nature.

For the first time administrative and government documents are using the words 'ecological catastrophe' to describe the forest damage; and given how cynically the bureaucrats normally play down environmental problems, that's an indication of the true extent of the problem. It's no longer the tip of the iceberg, but the iceberg itself. And it looks as though the European industrial nations are going to crash into it at full steam.

The only chance for saving the central European forests and the Scandinavian lakes is to immediately equip the older coal and oil power stations with desulphurization plants and other purification technologies, and by a permanent shift from energy consumption to energy saving and conserving. Saving energy is the energy source which is both cheapest and the best protection of the environment. Its importance was demonstrated long ago, but there is still too little of it. The utilization of waste heat in electricity production and heat conservation in the home are feasible, well-known examples of energy saving.

Further counter-measures are necessary in the field of transport: in the short term, a speed limit on motor vehicles; in the middle term, the maximum detoxification of vehicle exhaust fumes by catalysers; and in the long term, a different transport policy.

The chances of quick and effective action against acid rain are poor, particularly since air pollution is an international problem requiring decisive concerted measures. The construction of new tall chimney stacks in the sixties and seventies succeeded in reducing local air pollution in many areas, but at the cost of distributing it over a wider area. The waste gases from the industrial centres of West Germany, Belgium and Britain are carried to Scandinavia and are mainly responsible for the dead lakes there. Only half of the 3.6 million tonnes of sulphur dioxide, responsible for the dying forests in West Germany, is produced there; the other half is 'imported'.

A real clean-air policy must not simply result in a wider distribution of poisonous matter, but must suppress it at source, at the chimneys and car exhausts. But the prospects at the European level for strict emission limits do not look very good. In the USA and Japan, lead-free petrol and exhaust catalysers have been enforced for some time, and European cars exported there are fitted with catalysers. But it will be some time before compulsory measures are introduced in Europe. Italy and France fear competitive disadvantages for the smaller models built in those countries, and West Germany, which likes to present itself as the advocate of sharper regulations, is only too glad to use the resistance of other EEC countries as a pretext for inaction.

The Federal Republic has imposed relatively strict emission levels on new large-furnace power stations. However, the older existing plants will be allowed to discharge the same amounts of toxic material as they do at present until well into the 1990s. Even the German regulations, which are the strictest in Europe, will only reduce sulphur dioxide emission by about a third by 1993 and hardly touch nitrogen oxide emission. One measure long overdue in West Germany and already in force in other European countries is a motorway speed limit. That would lead to a marked reduction in nitrogen oxides.

However, irrespective of all national differences in clean-air legislation, it is clear that European policies will produce no decisive improvement in air quality by the 1990s, and will save neither the Scandinavian lakes nor the central European forests.

The North Sea

The North Sea is threatened in a variety of ways. Every day rivers carry

huge cargoes of poison into it, and thousands of tonnes of special waste and sewage sludge are dumped in it. In addition, large quantities of oil end up in the North Sea, the result of leaks from normal shipping traffic, of accidents, and of cleaning tankers and oil platforms. Then there are the effects of coastal industrial plants, air pollution and large-scale land reclamation. The Wattenmeer (a shallows and mud-flat area along the Dutch and German coast, between the Frisian Islands and the mainland, with a unique range of marine life) is especially threatened, but in the open sea itself, many species of fish have sickened and been decimated due to the presence of toxic substances.

There can hardly be a sea for which so many international agreements have been concluded and conferences held, without any significant result. This is most evident in the case of the 1976 EEC agreement on water pollution control, which was supposed to reduce the pollution of rivers and consequently of the North Sea. More than 100 individual regulations were planned, but after eight years only three have actually been issued; if matters continue at this pace, the final guidelines will not appear until 2250. The North Sea is often described as a test case for the preventive principle in environmental policies; in fact it is exemplary in demonstrating the wretched state of such policies.

Great Britain is playing a particularly inglorious role, blocking quicker and stricter regulation by insisting that serious damage in the North Sea is not yet apparent. This is contradicted by the decline of various species of fish and the recently observed oxygen depletion, as well as the bird deaths from oil pollution. In any case, as the forests have shown, when massive damage is evident it is already too late for an effective response. In a preparatory meeting for the 1984 North Sea Protection Conference, the Swedish representative sharply attacked British North Sea pollution. Britain replied that, as an island state, it had to put its waste directly into the North Sea; other countries could use the rivers, which then carried it into the North Sea.

The 'International Water Tribunal', held by environment groups with financial support from the Dutch government in autumn 1983, pilloried the countless cases of water pollution committed daily by firms in both East and West Europe. The already inadequate water protection laws are diluted in practice, and break down completely in the face of substances which are either entirely non-degradable or only degradable with difficulty, and which become increasingly concentrated over time. As with air pollution, it will in future no longer be sufficient merely to prescribe lower limits on particular items, total emission quantities will have to be reduced.

The tip of the iceberg

A thorough purification of waste materials produces special waste, highly contaminated by heavy metals or dioxin, whether in the form of sewage or flue ash. This shows that it is not enough just to limit emissions during production, but that the actual quantities of chemicals produced must be kept as low as possible.

The problems arising from special waste are clearly demonstrated by the poison dioxin. One of the worst chemical accidents in history occurred in Seveso in 1976. Overheating took place during an inadequately controlled reaction, the toxin was produced and several kilograms escaped. The area around the factory had to be declared a forbidden zone, and divided into a series of safety sectors, of which the core area is still not habitable. From the reaction chambers, the mixture with the poisonous dioxin was transferred to containers with the greatest precautions. The Swiss chemical firm Hoffmann-La Roche, owner of the factory in Seveso, thought it could get rid of the dangerous toxin quite simply. It contracted Mannesmann Italiana to transfer the poison waste to a special dump. Mannesmann, in turn, hired the French transport company, Spelidec, which took the 41 containers to France in September 1982. After that they disappeared.

This only became public knowledge in 1983; the 41 containers with the dioxin poison from Seveso held the European public in suspense for

months. But the search for the containers did illuminate the very great problems involved in the existence and 'disposal' of poison waste. The concentrated load of Seveso poison represented only the visible tip of 20 to 30 million tonnes of special waste produced annually in the European Community. Yet existing dumps and disposal plants have an annual capacity of only 8 million tonnes. Where the rest goes no one knows.

The public began to realize with horror what environmentalists had long known and constantly emphasized: in the production process of certain compounds, dioxin is either a by-product or can result from accidents; that certain end-products are contaminated by dioxin, for example, the herbicide 2,4,5-T, or the cosmetic ingredient hexaclorophene; that dioxin can be produced in accidental fires and by the refuse burning of many materials; and that there has been dioxin waste in existence for a considerable time, which usually has been inadequately 'disposed of'. So, during the search for the Seveso containers, it became known that 4,000 containers of dioxin waste from 2,4,5-T production had been stored under a ten-metre layer at the Gerolsheim special dump in the Rhineland-Palatinate in West Germany. Yet to dig them out again would be like sticking a hand into a wasps' nest—the results would be unpredictable. The same is true of the Hamburg dump, Georgswerder, where dangerous seepage into the ground water is possible. The chemical time bomb is ticking. Furthermore, it is unfortunately true that the dioxin, which is difficult to trace, was only discovered because, exceptionally, the authorities made an intensive search for it. It is an open secret that there are dozens, perhaps hundreds, of such dumps throughout Europe, in which similar substances are hidden.

In future, international regulations for dealing with special waste must be severely tightened up. Above all, the existence of poison waste must be combated, and products in which dioxin is produced as contamination or waste must be banned. There must be secure disposal of the waste that continues to be produced, poison waste tourism between countries must be limited, and the special waste businesses placed under strict control.

But here again the outlook for a European environmental policy is bleak. Stricter control and supervision of the incidence of special waste and its transport across international frontiers is not in sight, although when, in May 1983, what had happened to the Seveso containers became known, all the European governments swore to take action. The poison waste transporter, Paringaoux, who was taken into custody, admitted that he had hidden the containers in the grounds of an old slaughterhouse—behind corrugated iron. The containers have been found, the poison waste problem remains.

Bottomless

The contamination of soil and ground water by the dumping of special waste, by sewage, and by toxins in the air, are only a few of the dangers to which the land surface has been exposed for some time.

The intensive farming strongly promoted by EEC agricultural policy, and the separation of crop cultivation from animal raising as a result of factory farming, have broken the ecological cycle. The wide application of chemicals for crop treatment has led to overfertilization. One consequence of the excessive and unsound use of fertilizer has been an increased concentration of nitrates in soil and ground water which is quite considerable in some regions. As a result it becomes increasingly difficult to find water whose nitrate content is below the prescribed level.

Land is lost not only through poisoning, but also 'quantitatively', because of the increase in the built-up surface area. Agricultural land is taken over for trade and industry and for roads. This encroaches on the ecological and social functions of the soil, as a filter for ground water for example, and in the production of food and fodder. The problem is all the greater, since soil can't be purified in the way that water can.

The knowledge that the ground