



UNITED KINGDOM MISSION  
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*I think we need  
to take some  
international  
initiative  
quickly on  
the French side  
to take  
us the lead  
CDP  
B/x.*

Dear Charles,

Thank you for your nice letter about the Prime Minister's speech to the Royal Society. I am glad to have contributed to it.

I agree that the next thing is to make sure that something happens. The first requirement seems to me to isolate the significant areas of uncertainty, and then put real impetus behind research into them. Realistic policy cannot be made until more is known. In a rather messy British way (I speak as a former member of the NERC), much is already being done, notably by the CEGB. But my latest news suggests that many heads still need to be banged together, and that a coordinating tough guy or agency is required. If you have not seen it already you might be interested to see the Chatham House publication The Greenhouse Effect by David Everest which came out last week.

On the international side, which must be the crucial one, things are even more messy. Again much has been done but little of it has been brought together. At the United Nations we are doing our best, with like-minded people, to create the framework for future work. In the United States environmental issues take up almost as much space as the Presidential election (see the enclosed leader from last Sunday's edition of the New York Times), and that is no compliment to either. Conferences, high level groups and TV and other programmes abound. The problem is how to direct public interest rather than create it. A lot will depend on the next President.

Yours ever

Crispin Tickell

Sunday 9 October 1988

# The Next Generation of Poison

## *An Issue for the No-Issue Campaign*

America's air is mostly breathable. Its rivers don't catch fire anymore. Raw sewage usually ends up in treatment plants, not the nearest river basin. That much has been accomplished by the environmental laws of the early 1970's. Yet the campaign is only half won because tighter controls have been offset by the extra pollution from economic growth. Worse, society now confronts a new generation of environmental dangers, more insidious, far-reaching and intractable than the old.

The thinning of the life-protecting ozone layer in the high atmosphere is one such threat. Global warming — the feared greenhouse effect — is another. Air pollution, like acid rain and smog, is eroding the life of lakes and forests throughout North America and Europe. Pollutants draining off city streets and farms poison the coastal waters on which many estuarine and oceanic species depend. The world's richest nurseries of life, the tropical forests, are being destroyed at a horrifying rate: about six acres a minute.

The summer of '88 bristled with warnings, yet this second generation of environmental threats is not well understood. How can society find the money, courage and global cooperation to conquer them? There could hardly be a more urgent issue for debate in a Presidential campaign. Yet where are the ideas of the candidates, the men who profess to lead the way against the urgencies of the 1990's?

The old environmental problems consisted of visible threats to human health or comfort, often emanating from a single source like a plant or toxic dump. The remedies were clear enough: Make the offending industry pay to install pollution controls or clean up.

The new generation of problems is far harder to tackle. The sources are many and diverse, the damage often invisible or indirect. The victims are the ecology and atmosphere, with delayed damage to human well-being.

Powerful interests inhibit the search for solutions. Just last week, under pressure from utilities and the coal and auto industries, Congress gave up once again on efforts to combat acid rain and smog through reform of the Clean Air Act.

When Vice President Bush and Governor Dukakis talk environment, it's about barely relevant issues like Boston harbor and offshore oil drilling. Any remedies the candidates might propose are cramped by the immense debt run up by the Reagan Administration. Yet whoever wins cannot hope to escape the issue, any more than voters can escape thinking about it.



## Heat and Light as Killers

Humans have always thought the atmosphere to be so vast, so imbued with counteractive forces, that pollutants could make only the most gradual changes. No longer. The "ozone hole" that was discovered over Antarctica in 1985 seems to have been caused by minuscule amounts of man-made chlorine that reached the high atmosphere.

Ozone, though hazardous to plants and animals at ground level, serves as a life-protecting shield, screening out the sun's ultraviolet light that would otherwise cause an epidemic of skin cancer. Aside from the ozone hole, which mercifully is so far limited to Antarctica, chlorine seems to have caused a 3 percent thinning of the worldwide ozone shield in the last 20 years.

A corresponding surge in the ultraviolet light reaching earth has not yet been detected. But that's no reason for delay against so profound a threat to all forms of life. Last year, at the urging of the United States, several governments signed the Montreal Protocol, an agreement to freeze and then halve their production of CFC's, the industrial chemicals that carry chlorine to the ozone layer. That's only a first step.

CFC's take some 15 years to waft up to the ozone layer: destruction of ozone would continue that long even if all CFC's were banned tomorrow. A complete, worldwide ban on CFC's and the related halons cannot come too quickly. The next President has some hard diplomacy ahead.

The Montreal Protocol may be a model for addressing another worldwide threat, the greenhouse effect. A group of waste gases, chiefly carbon dioxide, CFC's and methane, trap heat from the earth's surface that would otherwise escape to space. Carbon dioxide, released by burning coal, oil and wood, has been steadily collecting over the last century. Theory suggests the world's atmosphere should already have started to warm.

Four of the last eight summers have been the warmest in a century. The drought in the United States and the floods in Bangladesh are exactly the effects expected in a greenhouse-warmed climate.

These are ominous warnings, but fall far short of proof that the global warming has begun. Yet if prevention is delayed until proof is irrefutable, a profound set of irreversible changes in the earth's climate will already have been set in motion. Rain patterns and crop ranges will shift toward the equator. The Gulf Stream may shift course, ceasing to warm Europe. If the West Antarctic ice cap melts, sea level could rise 20 feet, forcing the evacuation of New Orleans, New York, London and Beijing.

What remedies are sensible to contemplate? There's little justification yet for the enormously costly step of abandoning the use of coal. But several insurance measures against greenhouse warming are worthwhile in their own right. Banning CFC's is one. Saving tropical forests is another, since trees absorb carbon dioxide. American cars, houses, and appliances could all use energy more efficiently, with fewer waste gases.

Nuclear power plants produce neither carbon dioxide nor the gases that form acid rain. Development of a new kind of nuclear reactor, inherently safe and affordable, is a practical priority — but one scandalously neglected by the Reagan Administration.

## Nature as Victim

Americans have no idea how much waste their life style engenders: a yearly 25 tons per person. Only 3 percent of that is household garbage; most comes from industry, agriculture, sewage plants and incinerators. Toxic waste is now sent to monitored dumps.

But much of the rest escapes, brutally testing the resilience of natural systems.

Nearest to crisis are the nation's coastal waters and estuaries. More than \$300 billion has been spent on controlling water pollution since 1972. Yet with millions of people crowding the coastlines — by 2000, 75 percent of the United States population will live within 50 miles of shore — the deluge of waste is overwhelming.

Coastal waters are being poisoned by pesticides flushed off farms and suburban yards. Nitrogen from treated sewage and fertilizer runoff stimulates algae blooms that suffocate fish. Chesapeake Bay, Long Island Sound and San Francisco Bay are all at grave risk. Urgent reform of farm practices is one remedy. Another is to upgrade sewage plants and combined storm-sewer lines like New York's, that overflow after heavy rainfall.

Eastern lakes and forests are threatened by acid rain. Injected into westerly winds by tall smokestacks in the Ohio valley, waste gases mingle with moisture and fall as mild acid in the Adirondacks, New England and Canada. Under the continual chemical assault, many lakes have died.

Forests are also beginning to show the first signs of widespread decline. In the Northeast, red spruce and maple are dwindling. Growth rates of yellow pines in the South have dropped by half over the last 30 years. The damage is even more serious in the industrial heartland of Europe. Air pollution is almost certainly to blame, with acid rain and ground-level ozone the leading suspects. The next President will have little time to prevent Appalachia's forests from going the way of Europe's.

Tropical forests face a more immediate threat.

Governments like Brazil's disastrously encourage settlers to clear forest land for agriculture. But the soil, despite the forests' luxuriance, is poor. It yields a few years' crops, then reverts to wasteland, and the settlers move on to burn still more forest. In Brazil's province of Rondonia, home to a fifth of the world's plant and animal species, 17 percent of the forest is already gone. The 170,000 fires counted last year in the western Amazon contributed a tenth of the world's production of carbon dioxide.

The richness of tropical forests is the fruit of 50 million years of uninterrupted evolution. That millions of species and their home should be destroyed so wantonly is a historic offense, even though no law recognizes it. Persuading countries with tropical forests to preserve them is an urgent duty for the next President.

There is little in either Presidential candidate's record that displays deep understanding of environmental issues, although Michael Dukakis passed legislation in Massachusetts to curb acid rain, and George Bush has now broken with the Administration in calling for an acid rain program.

But ready or not, the next President will have the issues forced upon him. Persuading Americans to endure immediate costs for a long-term benefit will take leadership. Negotiating with other countries jointly to avert unproven risks will require statesmanship.

The alternative is a steady, perhaps even catastrophic decline of the natural systems on which life depends.

