

Atmospheric carbon dioxide

Two views on whether more means doom

Washington

TWO new studies of the "greenhouse effect" of atmospheric carbon dioxide raised the political temperature in Washington last week but added no surprising new information. A report by the Environmental Protection Agency (EPA), predicting a 2°C rise in global temperature by about the year 2040, was denounced by President Reagan's science adviser, George Keyworth, as "unnecessarily alarmist". But Keyworth praised a report by the National Academy of Sciences which said that a doubling of atmospheric carbon dioxide levels by late in the next century would cause a temperature increase of between 1.5 and 4.5°C.

Keyworth's reaction to the EPA study appears to be based as much on the tone of the report as on its conclusions. Using existing models of the world economy and energy use, the report says that as a "best guess", atmospheric carbon dioxide concentrations will reach 590 p.p.m. by 2060, roughly double pre-industrial concentrations. There would be a 2°C temperature increase by around 2040 and the total increase of temperature would approach 5°C by 2100. But the report stresses that the projections are extremely uncertain and that the rate of increase of other greenhouse gases, such as methane and chlorofluorocarbons, could greatly influence the timing of a temperature increase.

The National Academy report, also warning of large uncertainties in its projections, concludes that the concentration of atmospheric carbon dioxide will most probably double to more than 600 p.p.m. in the third quarter of the next century, with a 1 in 20 chance that the doubling will occur before 2035. The impact of such a doubling on the climate is hard to assess because of "fundamental gaps" in knowledge about the interaction between the atmosphere and the oceans, but the report suggests a warming near the lower half of the range of between 1.5 and 4.5°C.

The disparity between the EPA projections and those of the academy is not large and can be explained in part by the academy's use of a sophisticated new model of the energy economy that produces a lower rate of carbon dioxide emissions than most earlier studies. The model suggests that carbon dioxide emissions will grow by about 1.6 per cent annually until 2025 and that growth will then decrease to about 1 per cent. What appears to have irritated Keyworth is not EPA's projections themselves but its warning that early planning is necessary to deal with the disruptive effects of a global rise in temperature.

The National Academy report argues against immediate changes in energy policy and emphasizes the need for more research. While expressing "deep concern" about the possible range of environmental changes, the academy says the need is for caution rather than panic, and warns that hasty policies based on inadequate research could be costly and ineffective. It suggests that research and development should give "some priority" to future energy options not based on burning fossil fuels, but says there is no immediate reason to change the existing mix of fuels.

In contrast, EPA describes the potential changes in climate in the next century as potentially "catastrophic" and says that expeditious planning, as well as continued research, is essential. These recommendations, rather than the projections on which they are based, were singled out for criticism in a statement issued by the White House Office of Science and Technology Policy (OSTP). The federal government is

well aware of the greenhouse problems, and is currently spending \$20 million on research into the relationship between carbon dioxide and the climate, OSTP said. EPA's suggestion that planning is urgently necessary was "unwarranted".

The severity of OSTP's reprimand is puzzling. The "planning" called for by EPA does not appear to mean anything more dramatic than research on how to adapt to environmental changes, and the report explicitly rules out immediate changes in energy policy. Most of these, such as worldwide taxes on fossil fuels or a ban on synfuels and shale oil, would have little or no effect on the rate of warming, the report says. Only a total ban on coal would have a significant effect, but that would not be politically and economically feasible.

Also ruled out in the EPA report are the prohibition of carbon dioxide emissions (too expensive); afforestation (would cause too much competition for land, fertilizer and irrigation); and injecting sulphur dioxide into the stratosphere to reflect solar energy (still too many unknown side effects). Dr Keyworth's angry reaction may turn out to have less to do with the substance of what EPA said than with the fact that it appears to have said it without clearing its views first with the rest of the administration.

Peter David

AIDS

Plan for European centre agreed

A MEETING of 130 government representatives organized by the European regional office of the World Health Organization agreed last week to set up a European collaborative centre on acquired immune deficiency syndrome (AIDS). At the meeting, held at Aarhus (Denmark), Denmark, France and West Germany offered to accommodate the proposed centre, but a final decision will be made only when other governments have had a chance to respond to the proposal.

The objective of the centre is to create a European equivalent of the service rendered in the United States by the Centers for Disease Control at Atlanta, Georgia, which have been influential in defining criteria for the diagnosis of AIDS, for providing advice to physicians and the general public and for keeping track of the spread of the disease.

The number of AIDS patients in Europe was estimated at last week's meeting to be 267, roughly ten per cent of the number of cases in the United States. While the pattern of the disease (primarily occurring among male homosexuals, drug addicts and recipients of blood transfusions and blood products) is similar in Europe and the United States, European physicians are disturbed by what was called last week "the African connection", thought to account for the relatively high incidence of the disease in France (94 cases) and Belgium

(38 cases).

The conference last week agreed to accept as a basis for the identification of AIDS patients the diagnostic criteria promulgated at Atlanta last year. For the rest, the conference accepted that there has been no progress in understanding the aetiology of AIDS nor in the treatment of the condition.

Meanwhile, one graphic illustration of the pitfalls of over-eager interpretation of data bearing on the causation of AIDS was provided last week in *The Lancet* (ii, 963; 1983) by a group of pathologists from the Queen's University of Belfast, commenting on a report earlier this year of virus-like particles in electron micrographs of cells from affected patients (Feremans, W. *et al. Lancet* ii, 53; 1983) and a later account (*Nature* 305, 264; 1983) of the excited response of Belgian newspapers to that information. Dr Tom Gardiner and two colleagues from Belfast now point out that the supposed virus-like particles are virtually identical with organelles known as multivesicular bodies or, alternatively, as endosomes, and whose function appears to be to internalize NAD to reprocess complexes of external receptors with the ligands attached to them (see *Nature* 305, 684; 1983). Gardiner and his colleagues point out that endosomes (or rezeptosomes) are found in cells from all kinds of tissues, lymphocytes included. □