

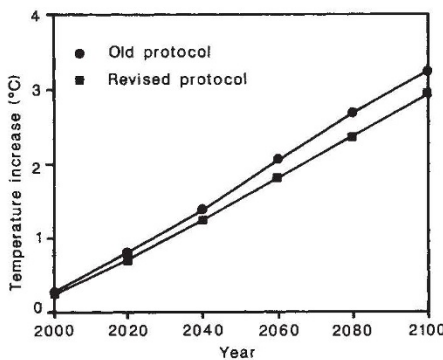
Warming to global agreement

London

UK Environment Secretary Chris Patten hailed last week's Montreal Protocol meeting in London as "a major step forward in environmental diplomacy", after participants agreed to phase out ozone-depleting chemicals more quickly than agreed at Montreal in 1987 and both the Indian and Chinese delegations said they would urge their governments to join the protocol.

The involvement of India and China, which both have the potential to develop large chlorofluorocarbon (CFC) industries, was in doubt until the United States withdrew demands that it should have control over an international fund to help developing countries finance alternatives to CFCs, in proportion to its 25 per cent financial contribution.

Effects of new protocol



New controls on ozone-depleting chemicals outlined in the revised Montreal Protocol will also reduce global warming, as some of the chemicals involved are greenhouse gases. The figure shows the likely effects of the new protocol on increase in global mean temperature from the 1990 value over the next century, carried out for *Nature* by Professor Tom Wigley of the University of East Anglia.

The prediction is from STUGE (Sea level and Temperature change Under the Greenhouse Effect), an interactive microcomputer-based model developed by Wigley and his colleagues Tom Holt and Sarah Raper. STUGE incorporates models used by the Intergovernmental Panel on Climate Change working group I, and Wigley makes the key assumption that a doubling of atmospheric carbon dioxide will increase temperature by 2.5 °C.

Wigley says that his prediction includes some *ad hoc* judgements about the use of the hydrochlorofluorocarbons that are expected to replace CFCs in the short term, and stresses that the model gives a best estimate, around which there may be some margin of error.

The amended Montreal Protocol has only a small effect on global warming, reducing temperature increase between today and 2100 by only about 0.3 °C. But Wigley says: "if we're going to make any progress, it will be the sum total of small effects".

P.A.

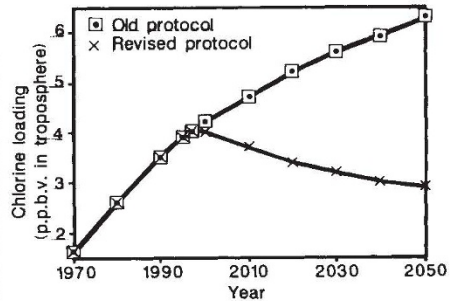
Under the 1987 Montreal Protocol, CFC use was to be halved by 1998, and halon use was to be frozen at 1986 levels in 1992. The new protocol has CFCs phased out altogether by 2000, following a 50 per cent cut by 1995 and an 85 per cent cut by 1997. Halons are also to be eliminated by 2000, except for some essential firefighting uses, following a 50 per cent cut in 1995.

Carbon tetrachloride and methyl chloroform, not covered by the 1987 protocol, are also to be phased out, by 2000 and 2005 respectively. Although these chemicals damage ozone less than CFCs and halons, they are used widely in industry.

Many nations pushed for even quicker progress, and near the conference's end, a 13-nation breakaway group led by Finland announced that its members would end their use of CFCs by 1997, irrespective of the final form of the protocol. US, Japanese and Soviet opposition prevented the conference adopting the 1997 target date, although the target will be reviewed again in 1992. Patten said that the United Kingdom, while not among the 13, would aim to eliminate CFC use by 1997, except for medical uses where alternatives are not yet available.

Scientists at the UK Department of the Environment have produced a preliminary

analysis of the effects of the new protocol on atmospheric chlorine loading (see figure). By 2050, chlorine loading in the troposphere, at 2.9 parts per billion by volume (p.p.b.v.), will be less than half that predicted under the 1987 protocol. Chlorine loading in the stratosphere, and hence effects on ozone depletion, will lag behind this by about five years.



Joe Farman, a member of the UK Stratospheric Ozone Review Group and the discoverer of the Antarctic ozone hole, is worried that even the new controls do not go far enough. He says that the aim for the London meeting should have been to reduce atmospheric chlorine loading back to about 2 p.p.b.v. as quickly as possible. The new protocol will not approach this target until late next century, after concentrations rise to an unprecedented 4 p.p.b.v., a timetable Farman describes as "madness".

Peter Aldhous

BIOMEDICAL RESEARCH

Young researchers go short

Washington

THE hard times being faced by young biomedical researchers in the United States were the major focus of a meeting on 'Support for Biomedical Research' held last week under the sponsorship of the National Academy of Sciences and the Institute of Medicine.

Although the National Institutes of Health (NIH)'s total funding has increased moderately over the past few years, there has been a steady fall in the percentage of successful applications in the 'new and competing' grants category — the grants that launch a young researcher on an independent career. This year as few as 22 per cent of applications are likely to be successful, down from almost double that percentage three years ago.

Many scientists now think that the problem of a shortage of funds was compounded by a decision made in 1985 by James Wyngaarden, then director of NIH, to increase the length of time for which grants run. The decision was made, in part, to provide scientists with greater financial stability and to relieve them of the inordinate amount of time spent renewing grants. But it has had the unintended side effect of intensifying competi-

tion among scientists fighting for their first grants.

Although most scientists agreed that the fundamental problem was a lack of money, David Baltimore, president of Rockefeller University, questioned whether available money was being spent efficiently. He claimed that the Howard Hughes Medical Institute, a nonprofit organization, will win a "disproportionate result" from spending just \$44 million this year to support young scientists.

Industry is continuing to play a large role in biomedical research. In 1979, industry funded 29 per cent of health research and development. Last year, this had risen to 45 per cent. As industry leaders acknowledge their debt to public-sector research, Baltimore suggested that industry could do still more to help by contributing about \$100 million a year to support young researchers and infrastructure development. But Senator Dale Bumpers (Democrat, Arkansas), who serves on the committee that appropriates funds for NIH, said that the federal government "must take a strong lead in basic research" and not leave it to *ad hoc* corporate decisions".

Diane Gershon