

GLOBAL CLIMATE

THE SCIENCE

It is said that the flap of a butterfly's wing in Peking can profoundly alter the weather in New York one week later. Probably an exaggeration, this is nevertheless an illustration of how an inherently chaotic system such as weather can develop totally different final states in response to fractional changes in its initial conditions. John Houghton at the Meteorological Office believes that, although short-term weather systems are notoriously unpredictable, the response of climate as a whole to macroscopic changes in key inputs such as global temperature should be ^{predictable}. Notwithstanding that hope, it is evident that great experts disagree by a very large factor about what the response of climate to global warming will be.

Warming

There is a two-fold uncertainty. Thermo-dynamic models of solar/atmospheric interaction predict global warming by the year 2050 of between 1° and 4.5° C. There is some evidence for recent greenhouse warming and global temperature has risen by approximately .5°C since the beginning of this century. The evidence is not conclusive. It is regularly quoted that the six warmest years on record have all been in the 1980s, but this may be a statistical foible. There was, for example, a decline in the mean global temperature between 1940 and 1965, also presumably a statistical quirk. 1816 has been described as the "year without a summer" when the mean global temperature dropped by nearly one degree. There were frosts in June and widespread crop failures.

There is a general balance of statistical evidence in favour of greenhouse warming and indeed an accelerated warming. But one must guard against the hysterical school of thought which argues that there is a desperate crisis already as evidenced by current year on year weather patterns. Annex A gives a good, balanced scientific view from the current edition of "Scientific American". It was sent to me by Crispin Tickell.

Inundation

The greatest uncertainty is the extent to which global warming will influence sea level. Predictions over the next century vary from figures as high as 1.4 metres, which would obviously devastate low altitude terrains, to conclusions that sea levels might initially decrease! This possibility was first drawn to my attention by George Porter. The argument is that increased temperature will lead to increased precipitation which will fall as snow over the poles and add to the antipodean ice caps. There will therefore be a net transfer of water from oceans into polar ice.

Such a divergence of expert views, and the two-fold uncertainty both on temperature and consequent sea level, emphasises the importance of intensified research. Meanwhile international conservation measures for carbon fixation should be vigorously pursued. The ministerial papers mainly address the latter.

TRANSPORT

The transport paper is basically defeatist seeking to use the problem of CO2 emission to excuse a failing transport policy. Muted suggestions of vast increases in taxation on private transport and massive expenditure on public transport

go right against the whole principles of consumer choice and the dissemination of centralised control. Most people's perceptions of the transport problem is that London and the South East is grinding to a halt. The motorway system has already become extremely unreliable with badly planned crash maintenance programmes which often have to be repeated through incompetence. These problems should be addressed in themselves through encouraging the private sector to build and operate roads. The long-term concerns for CO2 emission must not become any form of excuse for an inadequate transport policy today.

There is some technical disagreement about the compatibility of lean-burn engines with 3-way catalysts. Because of European NOx and HC legislation for cars over two litres, DTp argue that there is little point in pursuing lean-burn technology for such engines. Lean-burn is said to be incompatible with 3-way catalytic converters necessary for CO/NOx/HC reduction. Johnson Matthey, who admittedly have a vested interest, claim that a lean-burn engine can be compatible with 3-way catalysts because most of the time lean-burn engines will actually operate in normal stoichiometric mode. This is not some obtruse argument of chemical thermodynamics but the recognition that under conditions of acceleration leanburn conditions cease.

This issue must be resolved because we may wish to argue that EC environmental legislation has effectively shot itself in the foot by overrestrictive emission requirements which prevent improved CO2 management. The DOE paper makes a similar point. A note from Johnson Matthey is attached at Annex B.

ENERGY

The energy paper is very self-congratulatory, pointing out how well we are doing. The Rocky Mountain Institute recently

produced an argument that for the United States improved electrical efficiency would be seven times more cost-effective than nuclear power in abating carbon dioxide emissions. It is highly inconsistent of the Department to be cutting back their efficiency unit at a time when so much more needs to be done. Greg Bourne has produced a separate paper on this matter.

The very people who should be taking the intellectual lead seek to limit their involvement to "providing information which will allow consumers..." and pious exhortation to the DOE about insulating council houses. They did not however pass up the opportunity to lobby for some near market research for British Coal!

FORESTRY

Wood, particularly hardwood, is the best way to lock up carbon on earth. A natural forest in the steady state is not a net producer of oxygen because decaying trees produce CO₂ just as surely as burning fuel wood. Indeed, it may be desirable to promote longlived hardwood products, such as furniture, rather than campaign against them as do some environmentalists! This would ensure continued carbon lock up and also increase market pressure to plant more trees.

Net destruction of forest, particularly when the timber is burnt, releases carbon rapidly. Particularly pernicious is runaway deforestation where an under-developed country tries to accelerate its economy to take-off point by rapid depletion of forest resources in the expectation that it will then cease to be dependent upon them. This rarely happens although there was some success on the Ivory Coast. Forest depletion for fuel wood is predominant in primitive economies whereas forestry depletion for crop growing and

cattle ranching is common in Latin America, especially Brazil.

DEBT

Proposals for linking ^{redemption} debt retirement to deforestation have received much cold water, particularly from the FCO and the Treasury. I have nevertheless tried to ensure that Goldsmith's ideas are given some airing and, indeed, he will be at the climate seminar on April 26. He is not known for producing impractical ideas which don't work! He is a far-sighted cosmopolitan businessman who has demonstrated his own commitment to forestry, of which he owns millions of acres in North America. I am told that he made a recent sale with the stipulation that the new owner would not cut at a rate greater than replanting. Goldsmith incurred a cost penalty of \$50m for executing the transaction with this stipulation, so it is not all talk! He also distances himself from his brother, Edward, whom he regards as an environmental crank.

The Treasury's hostility is understandable. They naturally assume that any funds that go for debt purchase through the market place will be additional to the existing aid budget and will create a false and over-valued market in Third World debt. They also argue against the uncertainty which adding a market element would introduce. Indeed they always do this when market mechanisms are proposed. It has been said that the Treasury would rather pay a certain billion to solve a problem rather than leave it to the market which might solve it for half because that figure would be uncertain and therefore unplannable.

The FCO don't like Goldsmith's idea because the thought of tying the aid budget to some laudable objective such as forestry conservation goes against their whole philosophy

of handing out money with no strings attached. As always, they start from the position that the Third World has a right to our taxpayers' money and that if we attach strings to it they will go elsewhere which is then considered a black mark against the UK! You will be well used to that argument.

I continue to believe, despite the ministerial papers, that the concept of linking debt retirement to deforestation is imaginative and should be properly explored. It need not mean a blanket write-off as suggested by Brady and rightly rejected by the Chancellor. Why not start with a percentage of existing aid to be environmentally dependent, either via the Goldsmith mechanism or otherwise? The FCO's own paper points out that 83 per cent of the world's tropical forests are in countries with debt problems. To dismiss the idea out of hand that this linkage can be exploited simply because it is bureaucratically awkward and not invented by Whitehall would ignore a fortunate coincidence. The only real lever we have over the tropical forests is that their Governments need aid in some form. Latin American countries generally owe foreign debt through private commercial transactions rather than governmental obligation which predominate in Africa.

So that you can examine the Goldsmith proposal directly, I attach his letter to me in Annex C.

INSTITUTIONAL MACHINERY

The FCO paper assumes that the only sensible institutional mechanism is a revitalised UNEP. This would also be Crispin Tickell's route but he recognises that an enormous transformation of UNEP would be necessary. Its location in Nairobi and its low-level of funding mean that it is not taken seriously and therefore will not attract the best people.

Tickell also raises the possibility of extending the remit of the Security Council to environmental issues which seems to be an idea of Russian origin! Tickell also warns against going for a "Law of the atmosphere" because of the sorry history of attempts to reach agreement on a Law of the sea.

Although international efforts are ultimately essential, action must begin with economically strong countries. The 1962 atmospheric test ban treaty did not include France and China. Nevertheless, they now test underground because of international moral pressure. The important thing is to get a bandwagon rolling so that nonconformers will feel left out!

CONCLUSIONS AND RECOMMENDATIONS:

1. The diversity of expert opinion makes a proper assessment of the threat impossible with current knowledge. More work, particularly on environmental measurement and computer modelling, is an urgent priority.
2. The case for additional partners in ERS-2 is strong particularly with enhanced international awareness. Do not accept Fairclough's paragraph 13 that it is too late to re-negotiate. This is bureaucracy resenting change - the satellite will not be launched until 1994!
3. Scientific uncertainty is not an argument for inaction in the medium term. Because of volume, the most urgent problem is CO2 and hence the necessity of increased carbon fixation.
4. Tropical rain forests are the best method of fixing carbon that we have. The rain forest performs a service locking up this carbon and its value to the world as a whole

should be recognised. This may ultimately mean some form of payment to those countries with substantial rain forests in order to encourage them to maintain them.

5. Market driven mechanisms should also be encouraged. For example, long-lived hardwood products should be promoted rather than shunned.

6. Mechanisms for connecting overseas aid to environmental behaviour should be examined urgently. This examination should include debt related mechanisms of the Goldsmith type.

7. Departments, particularly Energy and Transport, should be shaken out of the smug assumption that they need do nothing further. In particular, Transport must not be allowed to invoke climatology as an excuse for their own failed transport policies. Neither must they be allowed to dismiss the lean-burn engine by hiding behind EC directives on NOx. Even if the EC has got its emission priorities wrong, this may not put paid to lean-burn technology.

8. The Department of Energy must take efficiency improvement far more seriously and not simply assume that everything will take care of itself once the electricity industry is privatised.

9. We should resist the establishment of any new institution for the handling of climate change and should rather work through existing ones. It is however hard to see how UNEP could take on effective leadership if it remains in Nairobi. Perhaps it could have an operating unit in the USA or Europe where the real work would be done.

10. The thin DOE paper concludes with ten good targets for the near term. They should all be supported.



GEORGE GUISE

ANNEX A - Article from "Scientific American", April 1989.

ANNEX B - Note from Johnson Matthey.

ANNEX C - Letter from James Goldsmith outlining a market based mechanism for linking Third World debt to tropical forest conservation.

SEMINAR ON CLIMATE CHANGE

DRAFT NOTES FOR PRIME MINISTER'S SUMMING UP

- Interesting exposition of state of scientific knowledge and stimulating discussion of wide range of possible responses, nationally and internationally.

- UK aims to base policies on sound science and good economics. Will continue to do so.

- Will continue to promote, at home and abroad, sensible measures to limit greenhouse gas emissions. Next year UK will host 2nd meeting of Parties to Montreal Protocol at which we hope strengthening will be agreed.

- Also important to step up our action where clear benefits can be seen. Already doing much to promote reforestation but will give this even greater priority. Have increased financial support to UNEP (from £1.25m to £3m this year). Keen to study ways of doing more.

- Remain convinced that measures to reduce greenhouse gases should be market-led where possible and must take place in conjunction with others. Will continue to press this with our competitors.

- Grateful for your contributions which we will consider very carefully.

SEMINAR ON CLIMATE CHANGE

DRAFT SPEAKING NOTES

WELCOME AND INTRODUCTION

- Welcome and thanks for attending.

- In speech to Royal Society last year, referred to increase in greenhouse gases and said it is possible we may have unwittingly begun a massive experiment with the system of this planet itself.

- If worst fears realised, scale of problem would be unprecedented. Could cause enormous changes to lives of everyone on this planet. Recognise that small changes in global mean temperature can have a great effect. Government has to prepare: for this reason we want to hear expert views at first hand.

- Of course more research is needed and I know that your own views will differ. There is the wide divergence of view on the impact of global warming on sea level from a large rise in sea level to an actual decrease as precipitation at high latitudes locks evaporated sea water up as snow and ice. We want to increase our scientific certainty. But at present we can only proceed empirically taking action only where we are certain of the cause and where a clear remedy is available. In some areas these conditions exist and they underlie the action we are taking to pursue them: they include proper fuel pricing to encourage energy efficiency and use of renewables, including nuclear power; better land use practices to discourage deforestation; and the strengthening and wide ratification of the Montreal Protocol on CFCs. Our recent conference gave this special impetus.

- We may need to take further measures - we shall hear views on this today. But this is a seminar. We are not here now to make policy. I want us to use this today to hear the

latest scientific advice; refine our understanding of the options which might be open to us and where they might lead; and discuss how to tackle this global problem internationally.

You will see officials with pens poised to take notes. I should make clear that there will not be an official record of the discussion which I hope will be informal and wide-ranging.