

cc: P Taylor

PRIME MINISTER'S SEMINAR ON GLOBAL CLIMATEWEDNESDAY 26 APRIL

Concern has mounted this decade that man-made emissions of the so-called greenhouse gases could alter the climate during the next century. There remain significant uncertainties in the science which need to be resolved. However if technologies need to be developed and put in place to mitigate this effect they may require very long lead times. The emission of greenhouse gases is a global problem and one that cannot be solved by any one country alone.

0930 Welcome and introduction by the Prime Minister followed by

Scientific assessment of climate change and its impact (to be introduced by Professor Tom Wigley, Director, Climatic Research Unit, University of East Anglia).

It is well established that certain gases (carbon dioxide, methane, nitrous oxide, chlorofluorocarbons, ozone) affect the radiative heat loss of the Earth, and that the concentration of these so-called 'greenhouse' gases is increasing. It is less clear what will be the resultant effect on the climate or when that change will take place. Recent reviews have put the range of warming as an increase in global average temperature between 1.5 and 4.5 C above pre-industrial levels by as early as the middle of the next century. Towards the upper end of this range effects may be discernible on agriculture and natural ecosystems. The prospects that sea levels would also rise by 20-140 cm have been of particular concern.

P. Currie;
Sir Chris;
T. Wigg;
Dr W

What is required to improve our understanding of this effect and its timing?

Has the greenhouse effect already begun?

Is the co-ordination of international research adequate to the task?

1020 Coffee

24 pwr

*10-25th
32 3 m Tom*

1035 Measures to mitigate the greenhouse effect (introduced by Dr. Ken Currie, Head Energy Technology Support Unit, Harwell).

*hardly ill
62 1 Tom*

A number of measures can be taken which reduce the emission of greenhouse gases but which are already justified in their own right. These include the phase out of chlorofluorocarbons ('CFCs') and investment in cost-effective energy conservation measures. Possibly the most difficult measure is to control the atmospheric concentration of carbon dioxide. Options include the wider use of nuclear power and renewables, large scale reafforestation and possibly direct removal of the carbon dioxide from flue gas.

*23rd W
Lange*

What is the potential of nuclear and renewable energy in reducing carbon dioxide emissions?

Targets standards

What is the relative importance of the options to improve energy efficiency?

What options are open to developing countries?

*Electricity
Richard
Phylos*

*Radiation
15 GW → nuclear power - 2000
→ Coal fired
would consume 40% of flue gas*

① Rent.

② ~~Debt~~ Payment
- own debt.

- 3 - how is not cutting them
forward. how is possible

130
Common debt.

Responses in the International Context (introduced by Sir Crispin Tickell, UK Ambassador to UN).

No one country can solve the problem of greenhouse gases alone. Effective action can only take place at the international level. One set of greenhouse gases, the CFCs, are already under the control of an international protocol developed by the United Nations Environment Programme. Negotiating this protocol has amply shown the difficulties involved, particularly in accommodating the aspirations of developing countries. UNEP and the World Meteorological Office have now jointly formed the Intergovernmental Panel on Climate Change (IPCC) which is to report in under 18 months on possible legal instruments and responses.

Global
Issues

Cold
Fusion

Avoid
X-axis ambition

Is there a need for an international climate convention?

Are current frameworks up to the task in hand?

What special provisions are necessary for developing countries?

Bolton
Cote d'Ivoire
Philippines
1230
Lebanon

3000 per year. → \$100 per acre. M&E U.S.
↓
Lunch \$ 120 billion 7.2 hr dollar
\$5-6 billion per acre. - 2000

loose framework
Convention

Dr. Pearce

1400

Summary of morning session and general discussion (introduced by Dr. Martin Holdgate, Director, International Union for the Conservation of Nature).

Scope for
every
convention

The United Kingdom in its opening statement to the IPCC reconfirmed its commitment to action based on sound scientific evidence but believed that some action was already justified. In particular the UK urged wide ratification and strengthening of the Montreal Protocol on CFCs, economic pricing of

environmental
impacts

they, through

Chandrasekhar
with
West
Abraham

energy sources to promote development of energy alternatives and energy efficiency, and better land use practices to reduce deforestation. Since then the UK has given substantial support to the work of the IPCC. This March it hosted the successful Ministerial Conference 'Saving the Ozone Layer'.

How should the UK advance its approach in the international community?

1510 Prime Minister's summing up

1530 Tea

avoidance
adaptation
abatement
assistance

- ① C'home effort always been with us. 33° C.
- ② Water -
- ③ Now -
- ④ Eilat @ Israeli Puffin

Solutions -

Schön Valley of Energy

Dr. Hagedorn
Dr. Watson

I.C.S.U

Schön Valley

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.

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.

*If you put garbage in
you'll get rubbish out*

Educated & informed young community

17 Q.S.

SEMINAR ON CLIMATE CHANGE, 26 APRIL 1989

Handling Brief

Purpose of Seminar

To enable Ministers to hear at first hand the opinions and advice of the foremost national experts on climatic change.

Handling

Each formal presentation will last about 20 minutes and be followed by a discussion period of about 25 minutes. (Timetable at annex A.) The second and third discussion periods are slightly longer to allow time for possible interventions by the Secretaries of State for the Environment and Foreign Affairs respectively. The list of participants is at Annex B with brief biographical details. The spread is wide and it may be helpful if participants introduce themselves before they speak.

Welcome and Introduction - 9 30 am

Notes which the Prime Minister may wish to use are at annex C.

Scientific assessment of climate change and its impact -
9 35 to 10 20 am

Professor Wigley (University of East Anglia) will describe the greenhouse effect, its causes, present climatic change, future projections (with a perspective from past evidence) and some possible effects.

The Prime Minister might care to follow Professor Wigley's introduction by proposing two of the three questions on the annotated agenda.

Parry

More overall
Peter Roddy

Continuum change
of record
noted

Has the greenhouse effect already begun?

What information is required to improve our understanding of this effect and its timing?

Notes

It might speed matters if Dr John Houghton Director Met Office was invited to speak first on the state of the Science Assessment in the Inter Governmental Panel on Climate Change.

The Prime Minister might also care to probe two further points important to the subsequent presentations.

- Is there a consensus on the scale or rate of climate change that must be avoided?
- Is there a level of greenhouse gas emissions that would stabilise climate change?

Possible specialist contributors to the discussion might include

Impacts of Climate Change

1900-1940

Decreased precipitation
Forest dieback
water supply

- Dr Martin Parry (general impacts)
- Professor Spedding (agriculture)
- Professor Unsworth (ecosystems)
- Dr David Drewry (ice sea system)
- Professor Lovelock (global)

Plant models

Issue as large as mix for last ice age model now.

Clouds in ocean - 2-3 km in the ocean.
Deposition

to early warning system 55 meters of ice level

Meteorology

- Sir John Mason (world climate research)
- Dr Bob Watson (NASA)
- Dr Fred Taylor (Atmospheric science)
- Dr Brian Hoskins (Meteorology)
- Dr John Wood (Role of Oceans)

(world climate research)

Dr. Mitchell

Time lag

The Prime Minister might care to wind up the discussion with the final session question from the agenda.

Is the co-ordination of international research adequate to the task?

Possible Specialist Contributors

Sir John Mason

Sir George Porter

Dr John Wood

Dr Bob Watson

World Climate Research
Programme

Royal Society

NERC, World Ocean

Circulation Experiment

NASA

COFFEE 10 20 am

Measures to mitigate the greenhouse effect 10 35 - 11 30 am

Dr Ken Currie (Energy Technology Support Unit) will introduce possible mitigating technologies, by exploring as an example the technologies necessary for an extreme reduction in CO₂.

Dr Ken Currie is Head of the Energy Technology Support Unit. He uniquely combines the responsibility for assisting greater energy efficiency in his work for the EEO and for assessing renewable energy resources.

Before opening the session to the floor the Prime Minister might care to invite the Secretary of State for the Environment to say a few words on the political dimensions. *A,*

The Prime Minister may then wish to divide the discussion into two parts:

(i) options for reducing the carbon output of energy production; and

(ii) and options for improving energy efficiency.

In addition the Prime Minister may wish to probe the role of the price mechanism to reduce carbon emissions.

Possible specialist participants are:

Price

Energy Supply

- ✓ Lord Marshall ✓
- ✓ Professor Ian Fells ✓
- ✓ Mr Robin Paul
- ✓ Mr David Cope

(CEGB)
 (Advanced Energy Technologies).
 (Industry)
 (Energy supply *ES* economics)

Energy Efficiency

- Mr Gerald Leach
- Professor Pearce
- Mr Michael Oppenheimer

(energy conservation)
 (energy conservation economics)
 (environmental protection)

The Prime Minister might wish to take the issue of forestry and developing countries at the end of this session, possibly referring detailed questions on foreign issues to the next session).

What is the role for forestry?

What options are open to developing countries?

Possible Specialist Contributors

- Mr Gerald Leach
- Mr Arnold Grayson
- Mr Robin Paul

(development economics)
 (forestry)
 (industry's view on technology transfer)

*Mr Grayson / Trees - store
 50 - 100 years
 20 - 40 years*

Newspaper - Tech - several columns.

Energy Efficiency - 5

*27 million acres
 deforested
 permanent*

Responses in the International Context - 11 30 - 12 30 pm

Sir Crispin Tickell is UK Ambassador to UN. Formerly of the Overseas Development Agency. His is an author of a number of books on the international issues underlying World Climate Change.

Sir Crispin will outline what has already been done in international fora to establish the basis for international action, discuss institutional problems in handling such action, international conventions, the role of non-industrial countries and the scope for British initiatives.

The Foreign Secretary may wish to intervene immediately after Sir Crispin's presentation.

The Prime Minister may wish then to explore the questions in the agenda:

Is there now a need for an international climate convention?
If so what might be suitable for inclusion in Protocols? Over what timescale should agreement be sought?

Are current international frameworks up to the task at hand? What special provisions are necessary for developing countries?

The Prime Minister may wish to explore the role of overseas aid, and 'debt for nature' swaps.

Specialist Participants

Dr Martin Holdgate

— Sir James Goldsmith
— Mr Gerald Leach

(international
conservation
nature)
(debt swaps)
(environment and
development)

Tropical forests

Population

Demographic

Summary of morning session and general discussion - 14 00-15 10

Dr Holdgate will bring out the main points to emerge so far.

Dr Holdgate is Director of the International Union for Conservation of Nature. He was formerly Chief Scientist at Department of the Environment.

The remainder of the seminar should be devoted to a more general discussion of the issues raised during the morning.

The Prime Minister will wish to ensure that the following points are fully covered:

UK's role in developing an international response. As a small, industrialised power, how are we to influence and help to reconcile widely differing expectations. If it is agreed that action is needed, how might the UK best keep up international pressure?

Prime Minister's summing-up - 15 10 pm

Notes are attached at annex D.

Tea - 15.30 pm

SEMINAR ON CLIMATE CHANGE: 26 APRIL 1989

- 9.30 : Introductory remarks by Prime Minister followed by presentation by Professor Wigley (scientific assessment of climate change and its impact).
- 10.20 : Coffee
- 10.35 : Presentation by Dr Currie (measures to mitigate the greenhouse effect).
- 11.30 : Presentation by Sir Crispin Tickell (responses in the international context).
- 12.30 : Lunch
- 14.00 : Summary of morning session and general discussion:
- 15.10 : Summing up by Prime Minister.
- 15.30 : Tea

Dr Martin Holdgate - Summary

(GLOBAL CLIMATE CHANGE

The purpose of this Seminar was defined by the Prime Minister in her opening remarks as the establishment of facts, so that policy was based on sound science.

The first session accordingly reviewed the state of knowledge of the greenhouse gases, their sources and their effects. It established that carbon dioxide, methane, nitrous oxide, chlorofluorocarbons, tropospheric ozone and water vapour do affect the radiative balance of the atmosphere, to differing degrees. It indicated the wide range of sources of the greenhouse gases, but also demonstrated that carbon dioxide, methane and nitrous oxide arose from activities fundamental to human civilization - agriculture, and the burning of fuels to generate energy. The reduction in emissions of these gases would consequently be a good deal more difficult than the elimination of chlorofluorocarbons, for which adequate substitutes existed, as the recent Conference in London on Saving the Ozone Layer had established.

The concentrations of the greenhouse gases have fluctuated substantially in the past, as a result of natural processes, but are now increasing through human agency. Carbon dioxide has the most significant effect on radiation balance, accounting for about half the calculated greenhouse effect, with methane accounting for 18 percent, CFCs for 14 percent, and nitrous oxide for 6 percent. If CFCs are eliminated, the relative importance of carbon dioxide will increase.

Eighty percent of the carbon dioxide added to the atmosphere as the result of human activities comes from the burning of fossil fuels, and 20 percent from deforestation, especially in the tropics. While therefore the latter process is important on a world scale, halting tropical deforestation will clearly not cure the problem.

At present the developed countries are the dominant sources of carbon dioxide. However the rapid growth in energy generation in the developing world means that they are likely to catch up the present industrialized countries in about 30 years.

Implications

The Seminar demonstrated that there is a near consensus that these increases in greenhouse gases will raise the mean temperature of the earth. An increase of approximately 0.5°C has occurred over the past century, and this fits the hypothesis that the greenhouse effect has already begun although it does not prove it. The evidence of rapid ice retreat in various parts of the world including the Antarctic peninsula also fits but does not establish the hypothesis.

Present calculations suggest that by 2030 AD the increase in world temperature is likely to lie in the range +0.5°C to +2.5°C. More important than the gross increase is the fact that the rate of increase will be between two and eight times that over the past century. The implication is that changes are taking place on a larger scale, in a shorter period, than the ecological systems of the earth have been

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exposed to at any time in the past 150,000 years, and this takes us into new territory when we seek to deduce how these systems will respond. Another feature of the phenomenon is the existence of substantial lags between cause and effect, so that today's impacts commit us to long drawn-out changes, lasting decades or even centuries before mean temperature and global sea level come to equilibrium.

There is some indication that global sea level has risen by of the order of 8 to 10 cm in the past century, and it is expected that there will be a significant and rapid increase in future, perhaps of the order of 10 and 20 cm by 2030 AD. This increase is expected to arise especially from the thermal expansion of the warmer seas and the melting of mountain glaciers, but its magnitude in the longer term depends critically on the response of the polar ice sheets. Again, the combination of rate and duration is critical. The rapid rise in sea level, prolonged over several thousands of years at the time of the melting of the ice sheets from the last glaciation exceeded the capacity of response of many coral islands and has led to well over a hundred known "drowned" atolls. However if the changes induced by current human actions last only for a century or so, the majority of coral reef systems should be able to keep up.

Present models and analyses make it extremely difficult to break the effects down regionally. Figures presented to the Seminar suggest however that the United Kingdom could be 4°C warmer in summer and between 4 and 5°C warmer in winter if atmospheric carbon dioxide doubled. Even larger temperature changes are likely in the polar regions. However changes in the magnitude and distribution of precipitation are likely to be of even greater environmental significance, and while some calculations suggest that the present wet areas will get wetter while the arid tropics may get drier there is no reliable basis for prediction.

Factors to be considered

The Seminar left no doubt of the complexity of the system with which we are dealing, and the considerable uncertainties in present models and analyses. A better understanding of the interactions between ocean and atmosphere and between living organisms and their habitat is especially necessary. It appears that carbon dioxide levels in the atmosphere may be governed especially by the plant life (phytoplankton) in the surface waters of the sea. There is a great need for better actual observations of what is going on in the world, to feed into the better models that are also needed if uncertainty is to be reduced and regional effects are to be predicted better.

In the further elaboration of the science, it is necessary to consider the likelihood of extreme events as well as mean situations. There is a possibility that the intensity of tropical storms and their frequency will change. It is also important that allowance be made for surprises. The "ozone hole" over Antarctica in springtime was not expected, and nature may well have other surprises in store. For example, the effects of clouds on global and local temperature balance have not been well analysed, and more needs to be known about the impact of deforestation in the humid tropics. The Seminar was told that one analysis suggested that

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the United Kingdom might get colder even if the world generally became hotter, should the ocean current system that currently transfers vast quantities of heat into the North Atlantic, drawn from the other oceans of the world including those of the southern hemisphere, be altered. Another area of uncertainty lay in the responses of plant life to higher carbon dioxide concentrations in a warmer world. Carbon dioxide itself might be expected to boost plant growth, as would warmer temperatures, but water supplies are likely to be limiting in many circumstances, and there are numerous interactions which are not properly understood. It was also important to bear in mind that even if crop growth were increased, it would not necessarily mean increases in yields.

Social impacts

It is evident that the social impacts of these changes could be large. The Seminar was told of one calculation of an increased expenditure required on the east coast of the United Kingdom of £5 billion, even if some areas were abandoned to the sea. Similarly, even if United Kingdom agriculture had the resources and flexibility to adjust to the changes, over the world as a whole there was likely to be substantial stress on the food-producing system. Many crop species were currently grown near the limits of their range, and changes in temperature and water availability would have a major impact in many regions, especially of the developing world.

Similarly, the impacts on natural environmental systems could be substantial. A 1°C rise in average temperature, in crude terms, could be compensated for by a movement of around 100 to 150 km towards the Poles or 150 m vertically, assuming that soil and other habitat conditions were comparable over these distances which they are unlikely to be. Evidence was presented that forest trees were unlikely to be able to respond by moving more than 10 km per decade, so that if in fact the limits of their growth were being shifted 50 km a decade, as some scenarios indicated, they would be in danger of being left behind, with consequent changes in ecological systems.

The Seminar was told of the substantial scientific effort in progress to reduce these uncertainties. However it was stated that there were only about 200 real experts capable of making a fundamental contribution to understanding. Given the existence of a much larger multitude of people making pronouncements in this field, the noise:signal ratio can clearly be expected to be massive and potentially misleading of public opinion. A plea was made for a reduction in the number of conferences debating the issue, while the competent scientists concentrated their efforts on amassing the knowledge that would make such conferences meaningful.

The potential for action

From the evidence presented to the Seminar, it is clear that exceptional measures would be required if the system was to be brought to stability with less than a doubling of carbon dioxide above pre-industrial levels.

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Against this background, a policy of waiting and seeing clearly emerged as unwise, even if there were uncertainties in the situation. It would be prudent to plan on the basis of the reality of the phenomenon and the desirability of social action to limit its impacts and eventually reverse it.

It was suggested that the response might come under the heading of "four As":

avoidance;
adaptation;
abatement;
assistance.

These needed to be based on national action, but within an international context.

The analysis presented by the Energy Technology Support Unit, and valid for other OECD countries as well as the United Kingdom, demonstrated that it would be technically feasible to halve carbon dioxide emissions by the year 2020. Some eight alternative types of action were presented, ranging through reforestation and the generation of energy from waste through increases in the efficiency with which fossil fuel was burned, more effective energy use in transport, carbon dioxide removal at power stations, the development of renewable energy sources, the expansion of nuclear power and the substitution of alternative fossil fuels to coal.

Of these, the most promising in technical terms was clearly the increase in energy efficiency, but it is difficult in practice because it demands the disaggregated action by a vast number of consumers, and is hampered by the slow turnover of the building stock within which much conservation has to be concentrated. The development of nuclear power is a second most promising contribution, provided that public opinion can be influenced to accept it. Fuel substitution could make a contribution in theory, but it was pointed out in discussion that there were limited amounts of natural gas that could be substituted for coal. Certain measures, such as reforestation and the use of wastes as fuel, only contributed at the margins but would nonetheless be popular with the public and worth pursuing for that reason. Taking all the options together it is clear that it is technically possible to achieve the abatement target, if practical policies can be established to deliver the various savings.

How to achieve these savings

One key to the achievement of policies to limit carbon dioxide emissions clearly lies in the field of public understanding. Public opinion needs to be influenced first so that consumers vigorously pursue goals of energy conservation. Public opinion likewise needs to be influenced if they are to accept a future nuclear power strategy that is safe and disposes of its wastes in an environmentally acceptable way. Public understanding could also play a positive part in the creation of new markets for energy efficient products, like more efficient cars.

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A second key to the future was the establishment of a clear strategy with appropriate incentives, which might include a mix of fiscal measures, pricing policies, taxation incentives and technical targets.

The establishment of such a strategy and such targets was important because they provided signals to industry and assuming that the strategy was sustained, a clear context for the substantial industrial investment that would be needed. Given a clarity in the definition of strategy, and an effective approach to public information, market opportunities could be created, both within the United Kingdom and internationally, so that the situation should not be looked on in industrial terms as wholly negative: it provided opportunities as well as constraints.

A different approach was needed however between developed and developing countries. Some of the measures listed, such for example as a massive expansion of nuclear energy generation, would not be practicable in the developing world. There was nonetheless great scope, through the provision of appropriate assistance, for a more energy-efficient growth pattern in the developing countries than they are currently pursuing, and it would be important to provide such assistance.

The world context

This brought the Seminar toward a consideration of the international field. It is clear that the greenhouse phenomenon is a truly global one, contributed to by the actions of all nations and affecting all regions of the globe. It is accordingly both essential and inevitable that the actions taken in response must be concerted internationally.

The nations of the world should not be grouped arbitrarily into two blocks: developed and developing (or "north" and "south"). They form a continuous spectrum in terms of their industrialization and economic strength. They display widely varying population pressures, which however constitute one of the most serious impediments to effective development, pose grave threats to environmental stability in many parts of the world, and could hamper the achievement of any strategies to stop climatic perturbation. Industrial growth is an imperative for developing countries, and in itself, by raising standards of living, provides the best hope of bringing about population stabilization. The developing countries are for the most part committed to paths of industrialization, and will not take kindly to being requested to adopt policies that inhibit it, especially in a circumstance where some 20 percent of the world's population is using over 100% of the safe dispersal capacity of the atmosphere! They are likely to look to the wealthy industrialized countries to take the measures that will release atmospheric capacity to disperse the carbon dioxide emitted from their growing commercial energy sector.

There is a major economic problem, at the world scale, because whereas a dear energy policy might be advantageous in promoting energy conservation in the developed countries, it would severely inhibit the process of industrialization and development in the third world.

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While these were intractable problems, it was clear that there would be a considerable need for assistance to the developing countries in order to establish patterns of activity which would be of global benefit. One area for such assistance lay in land use. It would be valuable to demonstrate that the sustainable use of forests, and stable systems of agroforestry are economically more beneficial to many tropical countries than the clear-felling of their forests, replacing them by impoverished pastures and erosion. Aid should also allow longer-term sustainable management patterns to be substituted for short-term destructive use of natural resources which could not readily be renewed. Debt for nature swaps could make a significant contribution in these circumstances.

Two other areas of action that might be considered involved adapting the global commercial system to favour the products derived from sustainable land-use policies in the third world, and assistance to help transfer sound modern technology (like, for example, the substitutes for chlorofluorocarbon that many countries have made clear at the recent London Conference they would like to introduce if they were helped to bear the costs of doing so).

Cooperation and coordination would also be vital between nations. One area for such cooperation lay in science. There is already a substantial international scientific research effort, which is cooperating in the use of satellite and other environmental data and the construction of models. The Intergovernmental Panel on Climatic Change is one component of that cooperation, and others are to be found within the International Council of Scientific Unions.

Another area for cooperation lies in the development of an international Convention, providing a framework for the coordinated action the world will require. Such a Framework Convention would be likely to include a commitment to cooperate in research, in the evaluation of results, in the construction and interpretation of models and in monitoring. It would be able to lay down a code of conduct at international level. It might include some provisions for international assistance. It would also contain commitments to discuss and eventually adopt protocols on particular areas of action like those agreed under the Montreal Protocol for reduction of chlorofluorocarbons (this protocol could equally well have been negotiated under a Convention on the regulation of human interference with the climate).

A third area for international action was institutional. There is already a substantial global institutional effort, in the United Nations and elsewhere, which needs to be made more coherent and effective.

It was suggested that this institutional machinery might include the following components:

- a) a new role for the United Nations Security Council, which could be required periodically to review major environmental issues of global concern, which undoubtedly do increasingly threaten the peace and stability of nations;

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- b) a coherent role for the UN Agencies Coordinating Committee (ACC) which does bring the major UN agencies together, under the aegis of the UN Environment Programme, but at the present time lacks the power to force the conjunction of plans or the adjustment of budgets to mutually agreed ends;
- c) a revitalized UN Environment Programme, potentially as the lead agency for the UN in these matters (although it will always be hard for UNEP to undertake the leadership of political discussions in New York when it is based in Nairobi);
- d) an enduring role for the international scientific effort, for example by prolonging the Intergovernmental Panel on Climatic Change as a committee with a defined role in the UN system.

A further international institutional measure that could be considered is the establishment of a fund for environmental problems, to be disbursed via the multilateral development banks, including the World Bank. Such banks could enter into commercial agreements for the rental of areas for sustainable management, payments being made when monitoring showed that the agreed policies were in fact being carried out.

Finally, it was suggested that there was a role in the institutional machinery for non-governmental organizations. Much of international science has been coordinated through the non-governmental machinery of ICSU. The International Union for Conservation of Nature and Natural Resources linked in membership 62 States, 130 government agencies and over 300 non-governmental organisations including all the major conservation bodies in the world, and this could provide a valuable forum for stimulating action which reinforced that agreed by Governments.

Conclusions

The Seminar demonstrated a virtually universal acceptance of the need to treat human perturbation of the climate, through the release of greenhouse gases, as a real threat to many socially important actions.

It was concluded that it was right to evaluate policies that could lead to the limitation of the impacts of this phenomenon, and its ultimate stabilization, in the most cost effective fashion, and this should be done in parallel with science that would improve understanding of the phenomenon and especially give a better basis for the regional assessment of its impacts.

It was agreed that there were real opportunities in this area for the United Kingdom, in partnership with scientists and policy-makers in other countries. In particular, the United Kingdom could contribute significantly to science, it could develop its own energy policies and other domestic activities so as to be ahead of the problem, on the basis that prevention was commonly better and cheaper than cure. It could contribute through helping to form public opinion and to create new demands and markets for products that would improve energy efficiency and reduce greenhouse gas emission. It could contribute in international policies, through aid, debt management, and the development of an

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appropriate Framework Convention. Above all, it could contribute, with other like-minded nations, in promoting the development of an international institutional machinery that worked.

Martin W. Holdgate
1 May 1989
2663c

RESPONSES WITHIN THE INTERNATIONAL FRAMEWORK

Notes for the Prime Minister's seminar on Global Climate Change, 26 April 1989

by Crispin Tickell

1. Introduction: 3 broad issues

- the global problem, with particular reference to non-industrial countries
- the idea of international agreements to cope with global warming
- the institutional aspect

2. The global problem

- artificial contrast between so called developed and so called developing countries: rather notion of a spectrum
 - industrial at one end who have created most of the problem
 - poor at the other
 - those in between - eg India, China, Brazil - and the problems of the future
- 3 main sources of greenhouse gas worldwide: the particular contribution of those from the poor and middle parts of the spectrum:
 - change of land use
 - CO₂: deforestation
 - methane: cleared land, paddy fields, ruminants etc
 - nitrous oxide: fertilizer and biomass burning
 - energy policy
 - CO₂: fossil fuel consumption and fuel wood
 - nitrous oxide: biomass burning
 - industrial policy: now little but more in the future
 - CFCs etc
- in all cases the driving force of population pressure of people, and the animals and plants associated with them: resource/population balance in many countries out of control: bleak prospects for sustainable economic growth
- so far most non industrial countries have not wanted to hear about problems of global warming. But report of the Brundtland Commission on Environment and Development may prove a turning point: need now to bring out:
 - likely global consequences, and still more important likely national consequences - and interest - in each case
 - some acceptance of the principle of equity (as in provisions of the Montreal Protocol over CFCs)

- practical measures of help

underline the fact that all remediable measures are desirable for good reasons other than the threat of global warming

- On each point above:
 - the consequences: inadequacy of existing models but likely
 - rainfall pattern changes
 - eventual sea level rise
 - environmental refugees as conditions deteriorate (wars over water and productive land)
 - spread of new diseases and pathogens
 - principle of equity: great difficulties in working out implications of polluter-pays principle, but example by the industrial countries - as the main polluters - the best precept:
 - discouragement of greenhouse gas production in industrial countries by whatever means
 - fiscal so that energy sources are taxed according to their greenhouse gas effect (Dutch precedent)
 - reforestation in industrial countries
 - practical measures of help to non industrial countries: this will require money, but costs not unmanageable: that is what aid programmes are for
 - land use
 - forest: conservation and harvesting: improvement of organic soils: agro-forestry: selection of trees and plants for semi arid conditions to halt soil erosion and reduce desertification
 - helping nature to adjust to rapidly changing conditions (forest migration, balance of C3 and C4 plants)
 - debt-for-nature swaps
 - changes in economic policy to eliminate wrong headed subsidies etc
 - energy policy
 - conservation: much room for it everywhere
 - small scale energy generating systems: hydro, solar, alternative renewable
 - better use of fuel wood (improved stoves) and growing and harvesting appropriate species of trees

critical issue the price of energy: otherwise India and China will use their coal: dilemma that

- in industrial countries prices must rise to reflect true costs
- elsewhere prices must fall to discourage use of indigenous coal and fuel wood

obvious danger of the market-distorting effects

- industrial policy: need to leapfrog such technologies as CFCs: tighter environmental guidelines on aid, and tighter control over export of noxious technologies

3. International Agreements

- avoid excessive ambition at the start: fate of the Law of the Sea: do not devalue process by trying to drag governments into obligations they would not respect
- advantage of loose framework convention: last year Britain co-sponsored the resolution passed unanimously by the UN General Assembly which involved action to "identify possible strengthening of relevant legal instruments with a bearing on climate, and to consider elements for inclusion in a possible future Convention". Detailed perhaps over ambitious work already in progress, notably by the Canadians
- within the framework a two pronged approach
 - guidelines or voluntary code to cover the most difficult areas
 - energy uses: conservative, efficiency, supply, pricing, research etc
 - major experiments with climatic effect: iceberg diversion, hurricane dispersal, artificial rain making etc
 - actions with likely climatic effect: river diversion (the Ob), melting of ice shelf, deforestation
 - specific agreements in specific areas as they arise: eg the 1987 Montreal Protocol on CFCs, and the 1977 Convention banning environmental weapons: in the future bring in CO₂, methane, nitrous oxide and other greenhouse gases

As work proceeds and experience - with international acceptance - grows, move items from the voluntary to the obligatory part of the convention

4. The International Aspect

- a look at what already exists
 - WMO
 - UNEP (1973): although endowed with coordinating functions among Specialized Agencies and other UN associated bodies with environmental responsibilities, it has no means of performing them, and is chronically under funded: its location in Nairobi is another handicap
 - World Climate Programme (1979)
 - Inter Governmental Panel on Climate (1988) with three working groups
 - science (United Kingdom)
 - impact (Soviet Union)
 - national and international responses (United States)
- a big and growing international debate on the global warming issue
 - Brundtland Commission
 - General Assembly 1987 and 1988, and more in the future
 - Stratospheric ozone aspect: the Vienna Treaty, Montreal Protocol, London conference, and Helsinki meeting to revise Montreal Protocol
 - The Hague conference and declaration of 24 countries

- Multiplicity of official and unofficial conferences
 - climate change (the Netherlands November 1989)
 - world energy (Canada September 1989)
 - World Climate Conference (Switzerland June 1990)
 - World Environment Conference (probably Brazil 1992)

In addition work among the super powers

- the United States: strong on the science but still debating political implications
 - the Soviet Union: much interest and many ideas
- problem of how best to cope in the future in the knowledge that what now exists is not satisfactory: four point proposal:
 - i) build up the technical bodies and make the most of them (while recognizing their limitations)
 - WMO: more financial support
 - UNEP: also more support and consider whether to promote to status of a Specialized Agency
 - World Climate Programme: again more support
 - Inter Governmental Panel on Climate Change: a useful body whose report next year should provide the scientific basis for policy making: its present mandate will come to an end but see below
 - ii) give top level political impulse by seizing the Security Council of environmental issues from time to time (quote Article 34: "The Security Council may investigate any dispute or any situation which might lead to international friction or give rise to a dispute in order to determine whether the continuance of the dispute or situation is likely to endanger the maintenance of international peace and security"): advantages of using the Security Council
 - avoid the hideous complexities of trying to create something new
 - keep matters under control through powers of the Five Permanent Members
 - bring in three of the largest landowners (United States, Soviet Union and China)
 - some would be unhappy (eg India, Canada, Brazil) but onus would be on them to suggest something else. In any case no-one can prevent Security Council which can determine its own mandate within the Charter
 - iii) Security Council cannot give day to day direction: idea of setting up under its authority (and with the endorsement of the General Assembly) an Inter Governmental Commission as a successor to the Inter Governmental Panel on Climate Change
 - precedent for such a Commission is: the Baruch Commission of 1946 which was set up to manage the then new problems of nuclear energy: although it ultimately failed because of Soviet withdrawal, its result was the International Atomic Energy Authority
 - its functions might be to tackle the problems and consider what might go into a framework convention: also
 - revision of UNEP: promote to Specialized Agency with new mandate

- consideration of coordinated approach to discouragement of greenhouse gas production (look at proposal for carbon tax, phasing out of subsidies, problem of those who refuse to participate)
- iv) consider not only bringing the environmental dimension more effectively into all the activities of the international financial institutions, but also setting up a special Environment Facility or Fund in the World Bank with similar facilities or Funds in the regional development banks
- if a four pronged approach of this kind is acceptable, it will be necessary to act fast to avoid other less desirable initiatives occupying the international agenda
 - begin with the United States and the Soviet Union: consult the UN Secretary-General who has already showed positive interest
 - then talk to the Chinese and members of the European Community
 - next consult the Canadians, Scandinavians and other environmentally conscious countries
 - go public
 - at follow up to Hague conference
 - in major speech by the Prime Minister
 - at the UNEP Governing Council
 - at the next Economic Summit
 - at the Commonwealth Heads of Government meeting

5. My Conclusions

- more generally recognize that science is full of surprises: things do not necessarily happen in linear or gradual fashion: we cannot be certain what will happen next: yet presumption is now good enough, and measures proposed could all be justified on grounds other than likely global warming
- politics is also full of surprises: again leaps and jumps can be necessary: it is now time for such in coping with a problem which could be as big as that of the discovery of nuclear energy.

CF

Global Climate
Seminar / Lunch
26 April

DM's letter of
13 April enclosing
agenda, etc went
to these people
on att'd list.

Sue 14/4

LIST OF GUESTS ATTENDING THE GLOBAL CLIMATE SEMINAR ON
WEDNESDAY, 26 APRIL 1989

Speakers

Professor Tom Wigley	Director, Climate Research Unit, University of East Anglia
Dr. Ken Currie	Head, Energy Technology Support Unit
Sir Crispin Tickell	United Kingdom Permanent Representative to the United Nations
Dr. Martin Holdgate	Director, International Union for the Conservation of Nature

Attendees

The Lord Marshall of Goring	Chairman, Central Electricity Generating Board
Mr. David Cope	UK Centre for Economic and Environmental Development
Dr. David Drewry	Director, British Antarctic Survey
Professor Ian Fells	Professor of Energy Conversion, The University of Newcastle upon Tyne
Dr. Tony Fish	Director, Shell UK Sittingbourne Research Centre
Sir James Goldsmith	Industrialist
Mr. Arnold Grayson	Forestry Commission
Dr. John Houghton	Director General, Meteorological Office
Professor Brian Hoskins	Professor of Meteorology, University of Reading
Mr. Gerald Leach	International Institute for the Environment and Development
Professor James Lovelock	Independent Scientist
Sir John Mason	Programme Director, Centre for Environmental Technology Imperial College of Science and Technology
Mr. Michael Oppenheimer	US Environmental Defense Fund
Professor Martin Parry	Atmospheric Impacts Research Group Coordinator, The University of Birmingham
Mr. Robin Paul	CBI

Professor David Pearce	Department of Economics, University College, London
Sir George Porter	President, The Royal Society
Professor C.R.W. Spedding	Professor of Agricultural Systems, University of Reading
Dr. Fred Taylor	Department of Atmospheric, Oceanic and Planetary Physics, University of Oxford
Sir Francis Tombs	Chairman Advisory Council on Science and Technology
Professor M.H. Unsworth	Professor of Environmental Physics University of Nottingham
Dr. Bob Watson	NASA
Dr. John Woods	Director, Marine Sciences, Natural Environment Research Council
Professor Sir Richard Norman	Chief Scientific Adviser, Ministry of Defence
Professor J.L. Knill	Chairman, Natural Environment Research Council
Professor E.W.J. Mitchell	Chairman, Science & Engineering Research Council
Mr. John Fairclough	Chief Scientific Adviser, Cabinet Office
Dr. D.W.F. Shannon	Chief Scientist, Ministry of Agriculture, Fisheries and Food
Dr. David Fisk	Chief Scientist, Department of the Environment