



Economics, Politics & Climate Change: Are the Sceptics Right?

Julian Hodge Institute of Applied Macroeconomics

Annual Lecture

Julian Hodge Bank Lecture, Cardiff, April 2008

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Colin Robinson worked for eleven years as a business economist, mainly in the oil industry, before being appointed in 1968 to the Chair of Economics at the University of Surrey, where he founded the Department of Economics and is now Emeritus Professor.

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Julian Hodge Institute of Applied Macroeconomics

In May 1999, Cardiff Business School and Julian Hodge Bank announced a major new initiative, the establishment of the Julian Hodge Institute of Applied Macroeconomics. The aim of the institute is to carry out research into the behaviour of the UK economy, and to study in particular its relationship with the other economies of Europe. This research has been given added urgency by the discussions on the future of the EU's draft constitution. The new institute has aimed to develop research relevant to this important debate.

The institute's director since it was founded has been Professor Patrick Minford, of Cardiff Business School, who is also the Economic Adviser to Julian Hodge Bank. The institute's staff of researchers are mainly based in the school. Recent research has included studies of whether the UK should join the euro and of the economic costs and benefits from UK membership of the European Union. Some other topics have been the UK's inflation and exchange rate behaviour and the relationship between growth and taxation. The institute also carries on the work of the Liverpool Research Group in Macroeconomics which Professor Minford founded and which has been based mainly in Cardiff for a number of years, producing forecasts and policy analysis of the UK and other major economies.

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Many people in this audience will believe that significant changes in the world's climate are already under way and that, in the medium to long term future, there will be further changes that will have catastrophic economic and social consequences if action is not taken in the near future to avert them. Virtually all the world's opinion leaders subscribe to that view. As one example of this 'doomsday view', take the comments of the UN Secretary-General, Ban Ki-moon who said of the scenarios in a report compiled by the Intergovernmental Panel on Climate Change (IPCC)² in November 2007, 'These scenes are as frightening as a science fiction movie. But they are even more terrifying, because they are real'³. Ban Ki-moon is talking about views of the future which cannot in any accepted sense be 'real': his comment shows that the inevitability of severe climate change is now so taken for granted that the future has become merged with the present.

1. The hypothesis and some broad issues

Put simply, the usual hypothesis about climate change is that emissions of carbon dioxide and other 'greenhouse gases', from the use of energy and from other human activities, will lead to a future trend towards warming of the earth and consequential damage to economic and social life.

There is general (though not universal) agreement that there has been some warming of the earth in the last hundred years or so, but it is relatively modest⁴. The IPCC puts the increase in global annual mean temperature at around 0.75 degrees centigrade over that period⁵. Future warming has become the main focus of concern: there is a wide range of estimates, varying from about 1 to over 6 degrees C⁶, comparing the end of the twentieth century with the end of the twentyfirst century.

¹ Some very helpful comments on a draft of this lecture were made by Sir Ian Byatt, Professor David Henderson, Dr Eileen Marshall, Sir Alan Peacock and by participants in a seminar at Cardiff Business School. None of them is, of course, responsible for the lecture's conclusions.

² A joint subsidiary of two United Nations bodies, the World Meteorological Association and the UN Environment Programme.

³ Secretary-General's address to the IPCC, 17 November 2007. The comment seems to refer partly to the IPCC's scenarios and partly to the Secretary-General's own observations of the apparent effects of climate change.

⁴ For a review for non-scientists of the problems involved in measuring temperatures and of assessing the scientific evidence see Nigel Lawson, *An Appeal to Reason: A Cool Look at Global Warming*, Duckworth Overlook, 2008.

⁵ IPCC, *Climate Change 2007, Summary for Policymakers*, page 2.

⁶ *Ibid*, page 7.

Obviously, I cannot provide a critique of the hypothesis from a climate science viewpoint⁷ but economists are in a position to comment on some of the underlying methodological issues, on the economic and social consequences of climate change and on possible policy responses and their effects. I begin by outlining the links in the chain that lead to the view that climate change will be damaging and make some initial comments on them.

1.1 A climate change trend?

Since the climate is always changing, the damaging change hypothesis is difficult to pin down, but I was careful to specify it as implying a *trend* towards global warming. I take it that those who support the hypothesis must think there is a such a trend. If we were merely in the upward phase of a *cycle*, caused by natural forces, presumably there would be much less cause for concern because, by definition, the direction of the cycle would reverse and global warming would be replaced by global cooling. Determining whether warming is a trend or just part of a cycle is extremely difficult, given the apparent very long time scale of climatic change, yet, from a policy point of view, the distinction between trend and cycle is clearly vital: if warming is to be replaced by cooling in the relatively near future, as part of the

same natural cycle, action now to curb warming might well have perverse effects. The amplitude and length of any cycle are also critical issues.

1.2 The link with greenhouse gases

There is scientific evidence that, other things equal, increasing emissions of carbon dioxide and other greenhouse gases will bring rising world temperatures. However, in the absence of complete scientific knowledge, the list of the 'other things' and their effects is long but incomplete. There is considerable controversy over the significance of man-made emissions, compared with all the other effects on temperature. Most climate scientists would, like most economists, readily admit that their models are gross simplifications and that large areas of ignorance remain. Working out what happens when other things are constant is therefore not easy and it seems that experience in the twentieth century must lead to some doubts about the exact causal link between emissions and warming: despite continuously rising emissions during the century, the warming occurred in two periods (1920-1940 and 1975-1998), with slight cooling in between the two periods and no clear trend in the last ten years or so.

⁷ For such a critique see Robert M. Carter et al, 'The Stern Review: A Dual Critique – Part 1 The Science', in *World Economics*, Vol 7 No 4, Oct-Dec 2006.

1.3 Economic and social consequences

Even if it could be established that there is a clear warming trend caused by greenhouse gas emissions, there are still important questions to be answered about the extent to which natural adaptation will deal with any economic and social consequences or whether, if action to combat the trend should be taken, what form it might take and what the costs might be compared with the benefits. Some economists, such as Sir Nicholas (now Lord) Stern, have attempted to answer these questions and to say what actions are required⁸. But, in the process, they have used some of the most heroic assumptions I have ever seen and tried to peer into the far distant future.

Bearing in mind these broad issues, in the rest of the lecture I will try to deal with a number of matters which seem important in deciding whether scepticism is justified about claims that damaging man-made climate change is in prospect. My purpose is not to say that there is no such prospect, but to argue that the sceptics should be taken seriously and that we should be careful not to plunge into large-scale, expensive, centrally run programmes to combat prospective climate change based on the assumption that we know more about the future than is possible. After making some rather critical comments about climate

alarmism in the first part of the lecture, at the end I will accentuate the positive and suggest how it might be best to face a very uncertain future prospect.

My starting point is to try to place the global climate change debate in a more general context.

2. The context

2.1 The conventional wisdom

The first context takes us back to the ideas of John Kenneth Galbraith who, in *The Affluent Society*⁹, coined the term 'conventional wisdom' which in a nice phrase he described as 'the name for the ideas which are esteemed at any time for their acceptability'. Galbraith went on to point out that, since exposition of the conventional wisdom 'has the approval of those to whom it is addressed', it is always in great demand and 'it follows that a very large part of our social comment – and nearly all that is well regarded – is devoted at any time to articulating the conventional wisdom'. The conventional wisdom is regarded as 'more or less identical with sound scholarship' and 'its position is virtually impregnable.'

Galbraith's notion of the conventional wisdom is a powerful one. The prevailing view that damaging climate change is in progress and

⁸ N.Stern, *The Economics of Climate Change*, HM Treasury, 2006. A recent modeling exercise, concentrating on macro economic effects of policies to combat climate change, is in the April 2008 *World Economic Outlook* of the International Monetary Fund.

⁹ John Kenneth Galbraith, *The Affluent Society*, Mentor Books, 1958. The quotations are from Chapter II.

will become worse in the future is clearly a major element in the conventional wisdom of the early twentyfirst century. It is an idea, in Galbraith's words, 'esteemed for its acceptability', and it 'has the approval of those to whom it is addressed'. Its exponents are regarded as 'sound scholars'. Leaders of the movement (for such it is) assure their followers and anyone who will listen that 'the science is settled', a dismissive phrase, intended to indicate that their view is beyond challenge.

As always, the conventional wisdom is spread and its pre-eminence is maintained, by 'intellectuals' most of whom, as Hayek pointed out, are essentially 'second hand dealers in ideas'¹⁰ rather than original thinkers. Prominent among today's second hand dealers are the numerous members of the media who provide comment on contemporary issues. Almost all embrace the view that immediate and drastic government action is required to offset damaging man-made climate change. Their general line is that it is obvious that such change is under way and that it is the duty of people (or, at least, other people) to change their life styles, particularly away from activities once thought liberating but now regarded as damaging, such as air and motor vehicle travel. The media tend to support the leaders of the movement, treating the arguments of the

relatively few dissenters as though they had little substance. The activities of the media therefore reinforce the position of this piece of conventional wisdom rendering it, in Galbraith's phrase, 'virtually impregnable'.

But does the damaging climate change hypothesis have the other characteristic implied by Galbraith's analysis of the conventional wisdom. Is it no more than the repetition of ideas that people want to hear and essentially empty of intellectual content? Or should we take it seriously? I will revert to that issue after discussing other contextual matters.

2.2 A religious movement?

My second context relates to the nature of the climate change movement. One major problem to which I have already alluded, faced by anyone who expresses any degree of scepticism about the damaging climate change hypothesis, is that the scientific establishment regards anyone who questions the consensus about climate change and its effects in much the same way as heretics are regarded by religious movements. Indeed, in many ways, upholders of the consensus view are a religious movement. As Sir Alan Peacock has argued, they have their own prophets and they readily denounce 'unbelievers'¹¹. Those prophets look far into the future, using not oracular powers as did

¹⁰ F.A.Hayek, 'The Intellectuals and Socialism', University of Chicago Law Review, Spring 1949.

¹¹ Alan Peacock, 'Climate Change and Human Freedom', in Colin Robinson (ed.) Climate Change and the Market Economy, Institute of Economic Affairs (forthcoming) 2008.

their forebears, but models which attempt to integrate scientific and economic variables; they see dreadful events which can only be averted if the present generation repents of the sins that are the root cause of these events; and they propose means of atonement. On their view of the world, scepticism is itself a sin. In an echo of earlier times, the climate change prophets have in recent years tried to silence counter views and suppress dissent. August members of the Royal Society, a body once noted for its cultivation of debate in science, are now leaders of the 'science is settled' camp: the only debate they consider to be legitimate is about choice among the different forms of the centralised action they believe is required to deal with the problems they foresee.

Moreover, the scientific establishment has a view of scientific progress which seems quite surprising in a historical context because it rests on the idea that any branch of science discovers a 'truth' which then remains untouched as it moves on to find other 'truths'. Surely this is not an accurate description of scientific progress over the years which constantly questions hypotheses and overturns them, often replacing them as they are discovered not to be the 'truth' after

all. In the words of the eminent psychologist George A Kelly,

'As a matter of fact, no confirmed prediction can be taken as evidence that one has struck bedrock truth. If one thinks of science as a simple digging operation by which solid bits of truth are uncovered, he is likely to be in for some disappointments.'¹²

But the 'science is settled' view in effect assumes that bedrock truth has been struck in the case of the science of climate change. It replaces genuine scientific enquiry and challenge by undue faith in the most recent hypotheses. Karl Popper would certainly have had something to say about this attitude to hypotheses in scientific inquiry.¹³

Finally, on the 'science is settled' issue, it is worth quoting some views that were expressed about prospective climate change in the 1970s, when climate change fears were a sub-plot in a world dominated by concern about an 'energy crisis'. The consensus then among climate scientists was the opposite of today's: global cooling was the perceived threat¹⁴, as an article in Newsweek at the time made clear.

¹² George A Kelly, 'Ontological acceleration', in B.Maher, *Clinical Psychology and Personality*, John Wiley, New York, 1969.

¹³ Karl Popper, *The Logic of Scientific Discovery*, Routledge and Kegan Paul, 1959.

¹⁴ See, for example, Colin Robinson, 'The Depletion of Energy Resources' in D.W.Pearce (ed.) *The Economics of Natural Resource Depletion*, Macmillan, 1975.

'The central fact is that after three quarters of a century of extraordinarily mild conditions, the earth's climate seems to be cooling down...Climatologists are pessimistic that political leaders will take any action to compensate for the climatic change, or even to allay its effects. They concede that some of the more spectacular solutions proposed such as melting the arctic ice cap by covering it with black soot...might create problems far greater than those they solve.'¹⁵

Some climate scientists will claim that they now know much more about the climate so we should not assume that the errors of present predictions will be on the scale of those associated with past predictions. That seems to me close to the 'bedrock truth' idea of scientific discoveries. I suspect that there is a vast amount more that they do not know and so it should be a matter of concern to those who now claim that 'the science is settled' in favour of global warming that the opposite view was generally held only thirty years ago. There still are adherents of the global cooling view whose papers have recently received more attention because of the failure of world temperatures to rise in recent years and because some recent studies have stressed the weight that should be attached to natural variations in climate¹⁶. As I understand them, many of

these studies argue that the effect on world temperature of man-made greenhouse gas emissions is very small compared with the effects of solar activity, which is the dominant influence, and that a cooling trend is in prospect.

2.3 Past apocalyptic forecasts

My final context is based on the observation that supporters of the doomsday view about climate change are usually so bound up in their own predictions of doom that they fail to recognise something very important – that they are part of the apocalyptic forecast genre, which again has religious roots. Apocalyptic forecasting, of which predictions of the dire consequences of climate change are one example, has a long history, which can be traced back at least to the Old Testament prophets¹⁷. The New Testament, of course, provides the somewhat more recent and more specific source document for the genre, in the Revelation of St John chapter 6, where the four horsemen represent the forces of man's destruction and where, following catastrophic events,

'...the kings of the earth, and the great men, and the rich men, and the chief captains, and the mighty men, and every bondman, and every free man, hid themselves in the dens and in the rocks of the mountains'.¹⁸

¹⁵ Newsweek, 28 April 1975. Julian Morris pointed out the Newsweek article to me.

¹⁶ An excellent source of information about such studies is Benny Peiser's electronic network CCNet.

¹⁷ Colin Robinson, *The Technology of Forecasting or the Forecasting of Technology*, Surrey Papers in Economics, 1972.

¹⁸ Revelation, chapter 6, verse 15, King James (Authorised) version.



Although the events, foretold in Revelation, which caused everyone to hide are particularly disastrous - the sun turns black, the moon is like blood and the stars fall to earth - subsequent history is littered with forecasts which are recognisable as belonging to same apocalyptic category in that dreadful events are foreseen unless people repent from some sin. As already explained, latter-day prophets of doom can be seen in a quasi-religious context in which they provoke feelings of guilt and then propose means of atonement. A characteristic sin is supposed lack of concern for future generations. So, for example, a recurring theme in the twentieth century was the claim that people were exploiting the earth's resources at a destructive rate which would leave insufficient for future generations: atonement was by acknowledging the error of their ways and adopting policies, such as reducing rates of depletion, which would leave more for their successors. The prevailing concern now is essentially that people are using up too much of the earth's environmental resources. Both views belong to an ecocentric tradition which stresses the value of the 'natural' environment and regards most human activities as damaging. I will come back to these views.

As each apocalyptic forecast emerges, there is a tendency to regard it as unique, with little recognition that it belongs to a general class of predictions. But the prevalence of such

forecasts in the past suggests that, regardless of the precise nature of the expected source of doom, there are underlying reasons why, periodically, such forecasts emerge. Rather than being aberrations, they are evidently part of the normal course of events. The explanations are probably quite simple. First, as regards the supply side, the prophet of doom is a member of a profession which, as well as any money income it may earn, enjoys psychic income from the effect of its prophecies on its audience: individual prophets may or may not be clothed in sackcloth and ashes but they enjoy supplying mental discomfort to their listeners or readers.

Second, and probably more important, the apocalyptic forecast is a natural reaction to the pervading state of uncertainty which creates both anxiety and a demand for predictions. At any point in time, any intelligent person can see numerous problems to which solutions have not yet appeared. That is so for the rather obvious reason that human ingenuity can, by definition, only be directed at solving problems after they have been perceived as such. Consequently, an abundance of unsolved problems is the norm. It is not difficult to find issues about which to be anxious - either that no solution is possible or that, if it is possible, it will not appear in time. But the presence of unsolved problems is not, in itself, particular cause for concern. In

the words of Dennis Gabor, 'The problems of fifty years hence will not have to be solved by our present-day technology but by that which we shall possess in twenty or thirty years' time'¹⁹

Seen in this context, one way of regarding the apocalyptic forecast is as part of the process by which unsolved problems are indeed solved. By raising awareness of an issue, the forecaster sets in motion forces that produce solutions. On this view, the apocalyptic forecaster – whether St John or, at a lower level, Sir Nicholas (now Lord) Stern – is an unwitting part of the great machine that stimulates human ingenuity into producing the advances in knowledge and its application that deal with the problems that always confront us. I shall return to that argument.

To summarise, the doomsday view of climate change should be placed within several contexts. First, it has become part of the conventional wisdom so that it is constantly reinforced by repetition. Second, it appears to be similar to a religious faith, which thinks it has uncovered a truth which should not be questioned and which therefore tries to suppress dissent. Finally, the view belongs to a general class of apocalyptic forecasts which appear periodically primarily because problems naturally precede solutions.

Of course, none of these observations about contexts should, on its own, lead us to believe that the doomsday view is incorrect. But I think they should make reasonable people enquire further about the extent to which it can be supported.

3. Centralised action and apocalyptic forecasts

Another characteristic of the apocalyptic forecast is that, as well as being a forecast, it always contains a call to action. It comes in two parts. Part one is the 'conditional' forecast – what would happen on unchanged policy. Part two is the plan – what should be done to avoid the dire consequences which the forecast has revealed. The latter-day apocalyptic forecaster, when turning to the plan, almost invariably recommends centralised solutions carried out by governments and international organisations. It would be unusual, if not unprecedented, for someone, having seen the apocalypse, to recommend leaving solution of the foreseen problems entirely to decentralised market forces. He or she will be too impatient and too distrustful of market processes to be willing to permit decentralised forces to work out ways of dealing with the perceived problem. Recommendations are usually for some direct government intervention in the market, though the use of 'market instruments' (see below) may also be

¹⁹ Dennis Gabor, *Inventing the Future*, Secker and Warburg, 1963.

recommended. In either case the recommendation will be for national government or international action so that someone is seen to be doing something.

But there is a serious problem with the view that centralised action, via governments and international organisations, is required to avoid the apocalypse. This form of action suffers from the same inherent problems as does central planning which, it is now almost universally acknowledged has, wherever it has been tried, failed. Briefly, there are two reasons. First, the information required for it to work – which is information about the future – cannot be gathered by centralised authorities. Information is not available off the shelf, to be collected together in Whitehall or similar locations, because it is essentially decentralised and much of it is tacit. The production and dissemination of information are primarily market phenomena and the suppression of markets, which is the inevitable consequence of centralised action, also suppresses the information that planners would need if they were to operate successfully.

The second problem is that, even if the information were available, the incentives to deal with problems are lacking. There is no Whitehall counterpart to the powerful self-interest motives to solve problems that exist in markets. On the contrary, the pursuit

of self-interest by people in organisations that have a monopoly of policy-making is most unlikely to be to the public benefit. Public choice theory – which is largely concerned with government as it is - has shown the dangers of assuming, as much mainstream economic theory does, that politicians and bureaucrats, domestic and international, are wise, far-sighted and disinterested and will simply identify and then pursue the 'public good'²⁰.

By contrast, the market system is essentially a massive problem-solving mechanism which offers a continuous referendum on choices. Markets may appear to operate slowly and 'imperfectly' but they do so surely. Competitive markets are powerful adaptive systems which contain strong incentives to solve the problems of the day, whether trivial or apparently serious. Unfortunately, the essence of the market's functions is often clouded by the mechanistic neo-classical models used by many economists which concentrate on end-states of markets rather than the processes by which they adjust to change.

One of the great insights in economics is Hayek's – that competition is a process of discovery, quite different from stylised textbook models of competition which show the states of markets once competition has been exhausted. That insight is the key to

²⁰ For example, Gordon Tullock, Arthur Seldon and Gordon Brady, *Government: Whose Obedient Servant?* Institute of Economic Affairs, 2000.

understanding the problem-solving power of markets²¹. Competitive markets provide the information and the incentives which spark the discovery process in which human ingenuity is exercised to deal with economic, social and technological problems. Marketplace incentives, operating mainly through price signals, induce entrepreneurs to seek out and then exploit market opportunities so as to make profits. Sometimes, entrepreneurial action may result in no more than the discovery of a slightly cheaper way of making a product or a slightly more efficient method of organising a firm. At other times, it may result in a major invention and its subsequent exploitation with global consequences. On a Hayekian view, the apocalyptic forecaster/planner who believes he or she can see a long way into the future and has the answer to the world's problems, substituting for and surpassing the problem-solving capabilities of markets, has been misled into the 'pretence of knowledge'²², if not into a 'fatal conceit'²³.

Of course, no one can be sure that there will always be an economic or technological fix for every conceivable problem that ever arises. But past history, including the failure of predicted catastrophes to materialise, suggests that market systems can act effectively to deal even with predicted global disasters. One particularly apposite example,

because it is the most recent and the one which bears similarities to the concerns of today, is the 'energy crisis' of the 1970s when there was a consensus that rapid depletion of energy resources (especially crude oil), allied with the exploitation of monopoly power by the Organisation of Petroleum Exporting Countries (OPEC), would result in ever-rising energy prices. 'The days of cheap energy are gone for ever' was the slogan of many commentators, unwise enough to think they could see 'for ever' into the future. There was near-universal agreement that only centralised action by governments and international bodies could avoid a major world energy crisis. In the event, despite the almost total absence of the government and international action that had been deemed so important, energy markets adjusted to the 'crisis' so that, within ten years, the world was (by the mid 1980s) awash with oil and OPEC was meeting to try to prop up crude oil prices. Instead of crude oil prices tripling in real terms by the end of the century, as had been the consensus of forecasts in 1980, they began to decline almost as soon as the forecasts were made and halved by the end of the century. Even today, despite recent increases in crude prices, they are still only slightly higher in real terms than in 1980²⁴. One of the interesting questions in the climate change debate,

²¹ F.A.Hayek, 'The Meaning of Competition', in *Individualism and Economic Order*, George Routledge, 1948.

²² F.A.Hayek, 'The Pretence of Knowledge', Nobel Prize lecture, 1974.

²³ F.A.Hayek, *The Fatal Conceit*, 1988.

²⁴ BP's Annual Statistical Review of Energy shows a series of crude oil prices back to the early days of oil exploration and discovery in the second half of the nineteenth century.

which I will come to later, is the extent to which we can rely on market forces to deal with any emerging problems associated with climate change.

4. Modelling and uncertainty: the example of the Stern Review

At the root of most attempts to forecast climate change and its effects are models which combine climatic factors with economic variables. The British 2006 Stern review of climate change is a notable example, including detailed modelling in a long and detailed report which looks ahead a very long way. Different time horizons are used in different places but they are all very distant. The review explains,

‘The analysis of climate change requires, by its nature, that we look out over 50, 100, 200 years and more.’
(Executive Summary p x)

It joins the Intergovernmental Panel on Climate Change (IPCC), some of whose scenarios it uses, in taking a very long term view. Quite properly, in various places the review expresses due caution about interpreting the results of modelling so far ahead which requires ‘caution and humility’, though by the time conclusions are drawn such reservations seem to fade.

Looking ahead for long periods is often supposed to be virtuous. Both markets and governments are sometimes criticised

because they have short time horizons and do not pay sufficient regard to the interests of future generations - as the Stern review argues, their implicit discount rates are too high. I return to the discount rate issue later. But there are good reasons why individuals and organisations do not habitually peer many years into the future and act on what they think they see. It is because, in practice, it is not possible to see far into the future and make enough sense of it to act usefully on the results. Inability, not unwillingness to look into the far distant future is the issue. Consequently people and organisations take limited views of the future, taking what action they can to anticipate future events but also adapting as they go along, using rules-of-thumb and other simple decision rules to muddle through in the presence of uncertainty. With decentralised decision-making in markets, there are many views of the future and the forecasting problem is ‘solved’ imperfectly through different forecasts, rules of thumb and adaptation. Those who are broadly right are more likely to make profits than those who are wrong.

In the climate change case, the danger is that, given our very limited ability to foresee changes in climate, technology, the economy and society, long term views are more misleading than helpful. Human myopia cannot be overcome simply by well-meaning attempts to build models that purport to peer decades and centuries ahead. Action taken

now, in anticipation of supposed long run trends, may concentrate on the wrong issues and make matters worse rather than better. As explained earlier, centralised action, which constitutes a large part of Stern's recommendations, risks major mistakes. Such action, by governments or international organisations, concentrates on consensus views (which have frequently been wrong in the past), creating information monopolies and suppressing dissenting opinions. It suffers from essentially the same problems as now discredited central planning.

Information monopoly has become a particular problem in the case of climate change. As David Henderson has pointed out, governments have allowed the Intergovernmental Panel on Climate Change to become a near-monopoly as regards information and views about climate change²⁵. He has argued that the processes of the IPCC are flawed in various ways, but in particular because its work is biased since those involved in its work are all 'true believers' that urgent action to tackle global climate change is required. The scenarios published by the IPCC, which look forward almost a century, have certainly become very influential in forming and reinforcing the prevailing consensus about climate change.

In addition to the time horizon, there are underlying problems related to this kind of

modelling. Modelling is a valuable tool in economics because it forces the conceptual structures of models and their parameters to be made clear. Moreover, as professional forecasters know, in principle it permits learning from experience in the sense that a post-mortem on a forecast (which, except by chance, will be incorrect) will reveal whether structure or assumptions were at fault²⁶.

But when the system that is being modelled is poorly understood and the intention is to make predictions over a very long period ahead (so that huge unforeseeable changes which affect model structures are likely) there is a clear danger that formal modelling will mislead. In the climate change case, the Stern review, for example, uses some models that purport to 'integrate' climate models with models of economic and social linkages to climate change. Integrating two poorly understood systems and making projections for long periods ahead, far outside the range of previous experience, moves the 'forecasts' into unknown territory, surrounded by massive uncertainty. Moreover, the danger is that, because the models appear to be able to quantify the future, the results will be given far more weight than is their due. Where these modelling exercises are discussed²⁷, the Stern review acknowledges the uncertainties around its results. But caution seems to evaporate as the review goes on.

²⁵ In a number of papers. See, for example, David Henderson, 'Governments and Climate Change: Questioning a Consensus', in Colin Robinson (ed.) *Climate Change and the Market Economy*, op cit.

²⁶ Colin Robinson, *Business Forecasting: An Economic Approach*, Nelson, 1970.

²⁷ For example, Chapter 6

Towards the end we can observe examples of a common phenomenon against which forecasters have to try to guard – that, because of the amount of effort they have put into their predictions, they begin to believe in their own results, no matter how shaky the foundations. Hence, on page 450 we read.

‘This Review has made a compelling case for action – on both mitigation and adaptation – demonstrating that the global economic costs of business as usual paths are likely to far outweigh the costs of taking action to reduce the risks.’

And, by page 572, there are ‘clear and strong conclusions’ about the dangers of government inaction which could lead to

‘...risks of major disruption to economic and social activity, on a scale similar to those associated with the great wars and the economic depression of the first half of the 20th century’

It is simply implausible to believe that the models that Stern uses can reveal sufficient about the future for any reasonable person to draw such firm conclusions. Because the models relate to systems about which there is considerable ignorance and because they go so far ahead, it seems most unwise to suggest that they can indicate so certain a long term future.

5. Markets and global environmental problems

Heroic attempts to quantify changes in climate and their effects centuries ahead give a false impression that such quantification can be helpful and suggest that the outlook is more certain than it is. Nevertheless, one should beware of jumping from the deficiencies of the Stern Review and its ilk to the conclusion that future climate change is not and cannot be a problem. It is conceivable that man-made climate change is occurring and that in the future it will cause difficulties unless preparations are made to offset or adapt to its effects. This is a separate issue that ought to be examined.

5.1 Differences in principle between resource depletion and global environmental issues

In principle, there are reasons why global environmental problems might be more difficult to solve via markets than the apparently similar resource depletion problems that have in the past caused alarm but which markets have dealt with so adequately. A significant difference in the case of resource depletion is that there are price signals that encourage changes in the depletion rate in the ‘right’ direction, as I have explained they did at the time of the ‘energy crisis’ in the 1970s and early 1980s. For reasons discussed by Harold Hotelling in

a seminal paper in the 1930s²⁸, changes in price expectations and discount rates tend to determine depletion rates (assuming technology and resource deposits to be given). For example, if there is a perception of increasing scarcity of a resource, future prices are expected to be higher relative to costs than previously anticipated, and there are two effects that increase the life of remaining resources. First, resource owners cut current production, holding back resources to reap the higher profits they expect from selling at increased future prices: as they reduce supply, current prices increase. Second, this increase in current prices induces consumers to reduce their demand. It was such effects that turned the oil 'scarcity' of the 1970s to the oil 'surplus' of the 1980s. But these benign market effects depend on the presence of appropriate market institutions, and in particular on there being reasonably clearly-defined and enforced property rights.

5.2 Property rights and market 'failure'

In general, provided property rights are clear and are enforced, as they are or can be for many environmental assets, owners will defend their rights against potential polluters as they would against other intruders and markets will work reasonably well. But where property rights do not exist or are difficult to

establish, as with the global environment which is not owned by anyone, is difficult to 'enclose' and so has no one to defend it, a case can be made for collective action. The argument is that there will be a 'global commons' problem. Just as common land may be over-grazed because it has no owner, use of the environment will appear to be free as far as a polluter is concerned. Consequently, it is argued, there will be an external cost that is not fully taken into account by the market and a tendency to overuse the environment as a sink for wastes. The natural environment has 'public good' characteristics in that people cannot be excluded from using it and so no charge can be made for that use. For such reasons, the Stern Review describes climate change as the result of the 'greatest market failure the world has ever seen'²⁹.

The specific case for collective action is that individuals and organisations that burn fossil fuels have little incentive to reduce the emissions of carbon dioxide that ensue because they bear merely the private costs of their actions (the price of the fuel and associated costs): these private costs are less than the full social costs of those actions, including the adverse impact on world climate. Hence, the argument goes, the external costs should be incorporated directly or indirectly by government, acting on behalf not only of those of us alive now but future generations.

²⁸ Harold Hotelling, 'The Economics of Exhaustible Resources', *Journal of Political Economy*, 39(2), 1931.

²⁹ Stern, *op cit*, Introduction, page viii.

6. Concern for future generations

The question of concern for future generations is worth further discussion. The resource depletion case will again illustrate the issues. Throughout the twentieth century there was periodic concern about natural resource depletion. Since there is apparently a finite stock of oil, coal, natural gas, uranium, the metals etc, should we be using those stocks or should they be conserved for future generations? It is a difficult question. First, which future generation are we concerned about? Is it those living late in the twentyfirst century or, for example, those living in and around the year 3000? The actions we might want to take would be quite different depending which future generation is our prime concern. Second, what would we actually do? Usually it is assumed that some stocks should be held back for people living in the future. That is not a straightforward strategy, first because the amount that is set aside depends on how distant are the generations about which we are concerned, but second because keeping back resources for future generations is not necessarily doing them a favour.

Think what would have happened if, two hundred and fifty years ago, at the beginnings of the 'industrial revolution' in Britain, some central planners had decided that they ought to conserve Britain coal reserves for the benefit of people living in the early twentyfirst century. We would have very

large amounts of coal now but, since we would have foregone all the investment and technological advance associated with the extraction of millions of tonnes of coal, in material terms we would be much worse off than we actually are.

Looking at the matter from the perspective of the present day, when considering what we should forego for the benefit of future generations, we should think about relative levels of prosperity as between ourselves and future generations. The history of recent centuries is of a strong economic growth trend which, if continued, will mean that looking ahead no farther than the last quarter of the twentyfirst century, our successors will be very much more prosperous than we are. Economic growth at a rate as low as 2 per cent per annum would quadruple income levels compared with now.

The prescription of the proponents of the doomsday view of climate change that we should invest heavily now to reduce the prospects of damaging climate change in the future parallels the view that, two hundred and fifty years ago, people then alive should have invested in coal reserves in the ground for our benefit. In effect, the proposal is that relatively poor people now should reduce their incomes to benefit people in the future who are likely to be very much richer. In those terms, their 'remedies' look much less appealing than when they say we must act for the benefit of future generations.

Economists like to pose these questions in terms of discount rates. At what rate should the future be discounted? Some, like Stern, think that the social time preference rate should be close to zero to reflect concern for future generations. That way, lie enormous problems. For the reason just given, there seems little reason to weight intergenerational transfers in favour of the wealthy. And, if it is argued that climate change projects in particular should benefit from a specially low discount rate, all kinds of distortions are likely to appear. A hidden effect, which may or may not be an unintended consequence, is that trying to incorporate in the economy a discount rate that is much lower than firms actually use can only be done by a considerable expansion of the government sector which would either have to carry out the necessary projects itself or raise funds in taxation to subsidise the private sector to do so³⁰.

7. The policy response

What policy response would be appropriate, given all the uncertainties about future climate change and its effects?

7.1 Picking winners

One response would be direct action by

governments to promote energy sources or technologies that promise to reduce carbon emissions. The two main candidates are nuclear fission power and 'renewable' forms of energy (those that do not diminish a capital stock), such as wind, solar, wave, hydro power and biofuels, though there are also hopes for 'clean coal' technologies and for technologies that would capture and store carbon.

In recent years, many governments in developed countries have been wary of permitting nuclear investment, partly because of the long history of over-optimistic cost forecasts for nuclear power³¹, but principally because of the potential adverse effects associated with nuclear fuel use and storage that have made nuclear power unpopular with electorates. In the face of climate change fears, however, there are signs of a revival of interest in nuclear generation, in Britain as elsewhere.

Renewable sources are already being promoted heavily. The British government, for example, is providing large subsidies for wind power in the hope of reaching a target of 10 per cent of electricity generated from renewables by 2010, with an 'aspiration' of 20 per cent by 2020³². The European Commission is setting even more ambitious

³⁰ For a discussion of the discount rate issue in climate modeling see Ian Byatt, 'Weighing the Present against the Future' in Robinson, *Climate Change and the Market Economy*, op cit.

³¹ Colin Robinson and Eileen Marshall, 'Can a New Nuclear Programme be Justified', *Economic Affairs* June 2006.

³² These various targets and measures to try to achieve them are set out in DTI, *Our Energy Future – Creating a Low Carbon Economy*, Cm 5761, 2003; DTI, *The Energy Challenge*, July 2006; and Department for Business, Enterprise and Regulatory Reform, *Energy White Paper*, May 2007. See also David Simpson, 'The Economics and Politics of Wind Power', in C. Robinson (ed), *Regulating Utilities and Promoting Competition*, Edward Elgar, 2006.

targets that would involve member states increasing the share of renewables in their energy (not electricity) supplies to 20 per cent by 2020. Another form of direct government action, but on the demand rather than the supply side, is to try to persuade consumers to use less energy by subsidising home insulation and other means of “conservation”. All manner of restrictions on people’s freedom to choose fuels and technologies are now being imposed, with five year ‘carbon budgets’ in the background (under a proposed new Climate Change Act), in an attempt to influence consumers to change their ways in directions the government thinks desirable. Every effort is being made, for example, to make owners of ‘gas guzzling’ cars feel guilty and to tax them heavily.

The problem with direct promotional action for particular fuels, with subsidised energy conservation and with regulation to enforce behaviour is that such measures do not address the basic property rights issue that is at the root of the apparent climate change problem. Instead, it involves government in the difficult process of ‘picking winners’, whether that ‘winner’ is nuclear power, or renewable energy or energy conservation or some apparently promising technology. Past attempts at picking winners have been notoriously unsuccessful³³, not just because

of specific failings of particular Ministers but for much deeper reasons of principle involving inherent information failures and the influence of pressure groups. Some of the climate change ‘winners’ that have been picked are already being seen as ‘losers’ – for example biofuels, where there are serious doubts whether certain biofuels will actually result in net carbon-saving compared with the alternatives. Unintended consequences are also appearing, as again in the case of biofuels, where government support seems to have resulted in rising food prices because of the increased demand for land to grow these crops. Nuclear power is another ‘winner’ that may not be all that it seems: an accident anywhere could cause such an adverse reaction that there might be widespread shutdowns or derating of operating reactors.

Analyses of climate change policy which urge direct action by governments are silent on these issues of principle about the ability of government to take successful direct action to promote particular energy sources. They ignore the economic analysis of government action, exemplified in ‘public choice’ theory³⁴, and the Hayekian view of competitive markets.

The Hayekian critique of government action, as explained earlier, emphasises the role of markets as discovery processes which

³³ For example, David Myddelton, *They Meant Well...* IEA Hobart Paper 160, 2007.

³⁴ As developed principally by James Buchanan and Gordon Tullock, though the public choice approach has its roots in the work of David Hume and Adam Smith. See Alan Peacock, *Public Choice in Analytical and Historical Perspective*, CUP, 1992.

produce information and embody powerful incentives to solve incipient problems which governments cannot match. It is complemented by the public choice critique which suggests that the chances are low that governments will improve welfare by attempts to pick winners. Governments are not disinterested servants of the public good. They are complex organisations, where self-interest is likely to play a major part in decision-making, and they are, for example, susceptible to the influence of pressure groups (unmentioned and apparently unrecognised in the Stern Review) which are likely to be very influential in pushing their own interests when governments are known to be searching for technologies to support. As explained earlier, governments face the most serious problem of central planners – that they cannot gather the information they need, which is essentially decentralised and would have been produced by markets had it not been suppressed by government intervention. Into the vacuum come pressure groups that supply information that supports their causes and ‘blinds with science’. Consequently government policies, far from being pursued in the ‘public interest’ are frequently significantly biased in favour of pressure groups.

7.2 Using economic instruments

If we rule out direct action by governments, for the reasons just suggested, we are left with an approach which is more appealing to mainstream economists because it addresses the property rights problem. That is to apply standard microeconomic theory by introducing some general ‘economic’ or ‘market’ instrument that will take into account the externality and will then allow the market to adjust without being constrained by the views of the government about which energy sources are most acceptable and how much energy should be conserved³⁵.

One such instrument would be a ‘carbon tax’ – a tax on fuel that varies according to the carbon emissions produced when the fuel is burned - which would attempt to move the price of carbon-emitting activities closer to what they ‘should’ be. Another instrument would be a carbon trading scheme under which permits to emit specified amounts of carbon are allocated (preferably by auction³⁶) and trading of those permits encourages efficiency in reducing emissions: such a scheme would allow a price of carbon to emerge. Carbon trading is favoured in the Stern Review and there were experiments with such schemes before one was introduced by the European Union in January 2005³⁷.

³⁵ Eileen C Marshall, ‘Energy Regulation and Competition after the White Paper’ in C. Robinson (ed) *Governments, Competition and Utility Regulation*, Edward Elgar, 2005.

³⁶ Allocation other than by auction invites lobbying, as in the case of the allocation of North Sea exploration and production licenses of which few have been auctioned.

³⁷ C.C. Nicholson, ‘Emissions Trading: A Market Instrument for Our Times’, in *Governments, Competition and Utility Regulation*, op cit.

Using market instruments, such as carbon taxes or carbon trading, should reduce the potential for government failure, as compared with direct government action. However, so far governments seem unwilling to rely on market instruments and instead insist on trying to pick some winners as well. For example, both the British government and the EU authorities are setting targets for 'winners' (such as renewables) as well as using carbon trading. The whole point of carbon trading is that it should put a price on carbon, thus leaving producers and consumers free to decide what fuels should be used and avoiding the need for further government intervention to determine fuel choices. There should be no need, for instance, for governments to decide whether or not there should be nuclear power programmes.

7.3 A case for collective action?

To summarise, there is a theoretical case for collective action (which could include action by governments and international organisations or voluntary action) where there appear to be particularly damaging environmental effects that cannot be reduced by the allocation of property rights. Anthropogenic global climate change may be an example. We do not know whether it will occur and, if it does, whether it will be

damaging. But, to guard against possible damaging climate change, we could take counter action by pricing carbon, either by taxing it or by establishing carbon trading schemes.

At this point, mainstream economic theory has no more to say. But we should have qualms about stopping analysis at this point. I understand the view of economists who make the case for 'market instruments', particularly if their case is that, once such instruments are established, direct action by governments is both unnecessary and undesirable. Nevertheless, we should recognise that there is an element of misrepresentation in the term 'market' instrument. Carbon taxes and carbon trading could just as well be labelled 'interventionist' instruments. In one case, the government sets a price and lets the quantity of carbon adjust: in the other case, it sets a quantity and lets the price of carbon adjust. I am reminded of Ely Devons' definition of government as 'the art of taking decisions in a state of relative ignorance'³⁸. Whether it is setting prices or quantities, a government is acting in ignorance of what the price or the quantity 'should' be. Real-world governments invariably fail both in their diagnoses and their prescriptions and their actions result in unintended consequences.

³⁸ Ely Devons, 'Economists and the Public', Lloyds Bank Review, July 1965.

The problem of ignorance is compounded in the climate change case. If there is to be centralised action to combat climate change it should be international – otherwise, activities will migrate to areas where control of emissions is relatively lax (thus possibly increasing world emissions if, for example, there are inherent reasons why energy is used less efficiently in those areas). But, at the international level, the ignorance problem is maximised because the ‘centre’ where decisions are being made is even farther away from where the information resides than is ‘Whitehall’. Moreover, international co-operative action is frequently undermined because of the incentives participants have to ‘cheat’, letting others bear the burden of adjustment whilst they participate as free riders. It is perhaps significant that the one example we have of a major carbon trading scheme - the European Emissions Trading Scheme - has been subject to such severe government failure that it may now be difficult to rescue it from the discredit in which it stands.

As far as government action is concerned, even if it relates only to the introduction of ‘market’ instruments, there is a multitude of possible problems. Given that it is setting taxes or allowable amounts of pollution in a state of ignorance, how confident can we be that the net effect of action will be welfare-improving? Then there is the question of whether, if governments act, there will be a significant encroachment on people’s

freedom (in effect, an external cost of government action).

To sharpen discussion, take the neglected question of whether, even if there is genuine evidence of damaging climate change, governments can be trusted to act effectively. Or will they give priority to appearing to be doing something, as they did in the energy ‘crises’ of the 1970s? There is a great deal of political posturing going on at present about climate change policy. In the EU, for example, summits and other gatherings result in grand declarations about targets for big cuts in carbon emissions in the very distant future. Nevertheless, at the same time, member country leaders are undermining the targets they set collectively by lobbying to make sure that their countries or industries within their countries are treated as ‘special cases’ that do not have to meet the targets. The case for collective action hinges on the idea that, in the absence of clear property rights, the market will not work well because there will be numerous free riders. But most EU governments are at present ‘cheating’ and trying to obtain a free ride by letting their fellow member states bear the costs of any carbon reductions. The same is true of the numerous international gatherings where politicians consider successors to the Kyoto agreement.

Political leaders clearly want to gather the electoral benefits of being seen to be ‘green’ without actually imposing on their electorates

the costs of doing so. It is tempting to set very long term targets – such as reducing greenhouse gas emissions by 60 per cent by 2050 (or possibly 80 per cent, as some would like), supported by five year carbon reduction targets, as the British government has done. But these targets go far beyond any horizon in which present-day politicians are interested and should, I think, be treated with great suspicion. In general, if there is to be an improvement in the market outcome resulting from government action, the government in question needs to be far-sighted, wise, able to identify the ‘public interest’ and willing to pursue it. It is not, I think, unduly cynical to question whether either governments in representative political systems or international bureaucracies have such characteristics.

7.4 Can markets deal with the climate change problem?

By contrast, well-functioning markets with appropriate institutions tend to produce benign reactions to emerging problems. Even though the vast majority of intellectuals think only of centralised action, there are great benefits in market responses, which permit gradual and flexible adjustment to perceived problems, which tend to act in the right direction (if not always as quickly as idealists might wish) and which avoid the restrictions on freedom which are one of the principal

external costs of government action. They are genuine ‘automatic stabilisers’ which work whether central authorities will them to or not.

Even apparently massive problems – such as those foreseen in energy markets in the 1970s and early 1980s – tend to yield to market forces. Most mainstream economists assume that appropriate market institutions do not exist in the climate change case because of the property rights problem I mentioned earlier, but that view can be questioned. Even in cases where goods appear to be ‘public’, it may be that the degree of ‘publicness’ is exaggerated. An example is the case of energy security which is often characterised as a public good but which, in practice, is largely incorporated in markets because consumers and producers are very conscious of security and therefore regard it as a characteristic of an energy good or service for which they are willing to pay. Energy markets will therefore, through the interactions of consumers and producers, provide security.³⁹

One can argue along similar lines about the natural environment. It appears to be a public good for the reasons I have mentioned, but what if there is general concern that it is becoming over-used? It is not necessarily irrational for people to contribute to the provision of ‘public goods’, even though they

³⁹ Colin Robinson, ‘The Economics of Energy Security: Is Import Dependence a Problem?’, *Competition and Regulation in Network Industries*, Vol 8 No 4, 2007.

know they are supporting free riders, if the provision is regarded as sufficiently important. In Anthony de Jasay's words, '...if the public good is valuable enough, it is potentially rational for non-altruists to contribute to it'⁴⁰. They are concerned that otherwise the public good will not be provided.

If there is sufficient concern about over-use of the environment, the effect will be as if it were owned. Actions by individuals are characterised not so much by narrow self-interest (in the self-centred sense) but by broader interests which include concern for family, friends and descendants. Let us assume that a large part of the population is very concerned about the world in which their children and grandchildren will grow up. This seems to me a reasonable assumption, though different from what is implicitly assumed by many people who work in the climate change field who often display a rather elitist and patronising attitude to their fellow citizens, as though concern for future generations were purely their own preserve and must be forced on to the *hoi polloi*.

In circumstances where there is widespread concern by individuals for future generations, one would expect that both consumers and producers (the latter both spontaneously and as a reaction to the views of consumers) would act in ways they perceive would protect their successors. If, rightly or wrongly, a significant part of the population is

concerned that there will be damaging climate change in the future unless something is done, it will demand and will be supplied goods and services that are deemed 'green' (in the sense of reducing greenhouse emissions). Market forces will thus tend to correct any emerging climate change problem. The 'perpetual referendum' which constitutes the market - which means that people are voting every day by expressing their preferences - will produce votes for 'green' outcomes which producers, in their own self-interest, 'not from benevolence'⁴¹, will satisfy.

Already, we can see such reactions all around us. A surprising amount of marketing now revolves around 'green' claims from suppliers of goods and services that they are reducing their 'carbon footprints'. No doubt some claims are false and others are exaggerated, but the important thing is that actions to mitigate climate change and its effects are now regarded as potentially profitable. Consequently, a market reaction in favour of 'green' goods and services is under way. It may be 'imperfect' and halting but, if you regard the pursuit of profit as a more certain mechanism for getting things done than action through the political process, this market reaction is to be welcomed. As I indicated earlier, forecasts of adverse effects from climate change may, provided they are not too exaggerated, have the beneficial

⁴⁰ Anthony de Jasay, 'Public goods theory' in Peter J. Boettke (ed.) *The Elgar Companion to Austrian Economics*, Edward Elgar, 1994.

⁴¹ Adam Smith, *The Wealth of Nations*, Book 1, Chapter 11

effect of stimulating decentralised action through markets.

This decentralised action will promote the discovery, through the exercise of human ingenuity, of means of adjusting to the prospect of adverse climate change. Adjustment to that prospect can, in principle, take two main forms. First, it can stimulate actions that make such change less likely. Second, it can promote adaptation to any change that still occurs. Obviously, we cannot see now the details of the adjustment process since those details are yet to be discovered. We can, however, anticipate that the 'greening' of consumer preferences will, so long as it is the prevailing tendency, lead to declining greenhouse gas emissions per unit of output, switching of fuel choices away from high carbon-emitting sources and the related investments in buildings, plant, equipment and vehicles that will provide the greener products and services. These effects of voluntary action are very much the same as those sought by proponents of centralised action. But they seem to me to have a surer prospect of success since they rely on the superior information and more clearcut incentives that markets generally provide, compared with political and bureaucratic processes.

Of course, would-be centralisers, including almost all those who carry out research in the climate change field, do not like the idea that market forces could be left to cope with

the climate change 'problem'. They distrust their fellow citizens and, like all pressure groups (and they are one now) would like to see their own views implemented through the medium of government. They characterise the market forces route as a 'do-nothing' approach. It is certainly not that. It relies on the reactions of millions of people and it seems to me perfectly possible that the decentralised market forces I have described, which result from the expression of people's preferences, are capable of overcoming the major obstacle to adjustment away from any global environmental issues that may be emerging - the absence of property rights in that global environmental (the global commons problem). The absence of an owner of the global environment will cease to be a serious problem if a large body of people in effect become substitute owners and therefore guardians of the natural environment.

8. Conclusions: the apocalypse and practical policy

In practical policy terms, once the apocalyptic forecast is seen in context and the likely failures of government action are recognised, the case for urgent, centralised action against climate change seems much less convincing than the conventional wisdom of the day would have it. One does not have to be a 'climate change denier' to

see that a degree of scepticism about the present consensus might be in order. In that sense, I think that the sceptics are right. Most likely, now – as in the past – many analysts have become carried away by the results of their models, which purport to look into a far distant future, and have convinced themselves that they must embark on a crusade to enlighten others. Dissent must be discouraged and indeed, in a mild version of the Inquisition, the views of anyone who questions the conventional wisdom should be disregarded and, if possible, suppressed. In such a climate, we need scepticism even if it brings condemnation by the top echelons of the Royal Society.

On a cooler view of climate change, a more constructive approach would be to recognise the huge uncertainties that exist and to seek flexible means of dealing with the problems that may arise. Direct promotion by governments of particular ways of ‘solving’ the perceived problems is unlikely to succeed and is only too likely to have unfortunate side-effects, including constraints on individual freedom. Market instruments, such as carbon trading systems or carbon taxes are preferable to direct government action, but they involve significant intervention without the knowledge on which to base that action. I doubt whether they can be justified

at present when we can see a spontaneous market reaction in favour of ‘green’ products and services. The call for centralised action is much more about the appearance of being busy than about useful action against climate change. It runs the risks of major errors, even in the direction of policy, and one should remember that centralised action is always difficult to change, even marginally, let alone reverse if circumstances require.

Economists who propose reliance on markets to deal with natural resource and environmental problems are sometimes accused of being Panglossian⁴². But remember what is the alternative. I suspect the true descendants of Dr Pangloss are those who have faith in very long term forecasts of climate change and its effects and who think that, in the face of recent experience and examples they can see all round them, centralised action is the answer. In practice, if damaging man-made climate change is in prospect, the only real hope of avoiding the damage is probably through market responses: the chances of effective action by governments and international bodies seem to me very low.

A big advantage of relying on markets is their flexibility and adaptability. Views about global warming will change. It may appear a more serious issue than now, in which case

⁴⁰ Anthony de Jasay, ‘Public goods theory’ in Peter J.Boettke (ed.) *The Elgar Companion to Austrian Economics*, Edward Elgar, 1994.

⁴¹ Adam Smith, *The Wealth of Nations*, Book 1, Chapter 11

⁴² Dr Pangloss is a character in Voltaire’s *Candide* who is excessively optimistic.



markets will enhance the profitability of 'greenery', so reacting in the 'right' direction. Or it may seem less serious, so that 'greenery' starts to go out of fashion and the market again reacts in the right direction. Can we be so confident that the big programmes now being urged by the climate change alarmists would show a similar degree of adaptability to changing circumstances? They are all too likely to set

communities on courses which are very difficult to change as the views of climate scientists change. The late Arthur Seldon once said that, given all the pressures there are for government to expand and all the adverse effects of such expansion, when considering policy we should 'take a risk on under-government'⁴³. Those were wise words and, in my view, directly applicable to the present debate about climate change policy.

⁴³ Arthur Seldon, *The Dilemma of Democracy*, Institute of Economic Affairs, 1998, Introduction

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