

Liberal Democracy and the Globalization of Environmental Risks

David Goldblatt, Ph. D*

Table of Contents

- I. Introduction
- II. Environmental degradation and the limits to liberal democratic politics
- III. The globalization of environmental problems
- IV. Ozone depletion
- V. Global warming
- VI. Democratic conclusions

I. Introduction

Across the world societies are currently experiencing and looking forward to historically unprecedented levels of environmental degradation that pose dangers to human health, ecosystem survival and increasingly threaten economic development and social stability. This is because the toxicity and complexity of pollution has increased and the sheer volume of people, degradation, like demographic expansion, is a cumulative phenomena. We are all facing the toxic pay-back for the North's industrial revolutions - both capitalist and socialist. We are all beginning to reap the consequences of the explosive pace of industrialization and population increase in the South. Not all states or societies are affected equally, similarly or in proportion to the environmental degradation that they are collectively responsible for. Nor do all social groups in all societies experience similar environmental threats

* Professor of Sociology, The Open University, United Kingdom

or accord a similar priority to curtailing environmental degradation. None the less, no polity, democratic or otherwise, has been left untouched by these epochal transformations. In this paper I focus on the impact of these shifts on liberal democratic states.

In Section II I examine the implications of environmental degradation for democratic politics within nation-states. I argue that liberal democracy's capacity to respond to environmental degradation is limited and that its existing representative and parliamentary institutions do not allow for effective democratic control over environmental policy matters. . . Because of the causal origins of environmental degradation, states are forced to try and regulate areas of social life that have previously been ignored. Causally, environmental degradation is immensely complex - its origins can be traced to economic, demographic, political and cultural factors. For example, cars are too cheap to drive, too many people are driving them, politicians will not make it more expensive for them. In any case, we all love the car, don't we? In general, we seem capable of generating immense new technologies without stopping to consider their likely environmental consequences. States, democratic or otherwise, are called upon by the exigencies of environmental degradation to try and regulate the previously unpoliticized and apparently benign dynamic of technological change.

The political impact of environmental degradation is also complicated by its spatial character. Environmental degradation, actual and possible, is becoming increasingly globalized in its origins and consequences; knitting together states and societies in complex webs of mutual interdependence and international regulation and interaction. As such, it is not only the representative character of liberal democratic states that is problematized by environmental degradation, but also their territorial form as autonomous or sovereign nation-states. In Section III I review the concept of the globalization of environmental problems. This will allow us to determine the transformation of the conditions of liberal democracy that global environmental problems in particular, rather than environmental problems in general, set in motion. Finally, I examine the democratic challenges these changes pose for liberal democratic states.

In Sections IV and V I examine two case studies of serious global environmental problems : ozone depletion and global warming. I review the character and causes of environmental degradation, the threats they pose, and the ways in which states have tried internationally and domestically to respond to these problems. I ask how the political peculiarities of environmental degradation in general, and global environmental degradation in particular, affect or prevent the nature of democratic responses to these issues. In Section VI I ask whether, on balance, global environmental degradation is undermining the legitimacy and efficacy of liberal democratic states. Against this I examine the argument that new democratic practices, locally, nationally and globally are emerging which both preserve the democratic credentials of liberal democratic states and generate new spaces for democratic politics.

II. Environmental degradation and the limits to liberal democratic politics

In the 1950s environmental issues formed a small and insignificant part of public debate and political agendas in liberal democratic societies. On the margins the worst excesses of air pollution became the subject of legislation and regulation, land and species conservation legislation began to develop and the creation of national parks got underway. However, these hardly constituted the mainstream of politics. By the 1980s and 1990s, although environmental issues had not displaced more traditional concerns, they had acquired an enduring place on the political agendas of liberal democracies. It has been impossible for governments to avoid engagement with global warming, ozone depletion, acid rain and toxic waste issues. Nearly all liberal democratic states now possess a larger and more stringent body of environmental legislation; they have acquired permanent, environmental ministries and environmental protection agencies (Weale, 1992). While the fortunes of Green parties vary - from successes in Germany to the enduring irrelevance of the British Greens - and the power, income and membership of environmental pressure groups

fluctuate, there has been a secular rise in their importance, their impact on main-stream parties of both left and right (all of whom must now profess, at least, to be environmentally concerned), their incorporation into the policy process and a shift in the terms and character of political debate (Robinson, 1992). None of this appears problematic for liberal democratic politics. Indeed, it is an example of democracy at work. A combination of protest, persuasion and electoral success has dragged environmental issues and interests into the political arena. However, a series of arguments also exists which suggests that the nature of environmental degradation and the rise of environmental politics pose a range of problems for liberal democracies.

1. Invisibility, uncertainty and the long term

Three physical characteristics of environmental degradation set particular constraints upon environmental politics: the invisibility of pollution; the uncertainty of its impacts; and the enduring and cumulative character of its consequences. Some of the consequences of environmental degradation may be visible to the naked eye and to the uncritical observer - dead fish in a river are difficult to miss. But, many of the physical and biochemical processes which generate environmental problems are socially invisible. No one can see heavy metals leaching into the soil from a waste dump, no one can sense radioactive isotopes in the atmosphere. More often than not, the occurrence of environmental degradation and its physical and biological causes can only be revealed by specialized technologies, scientific discourse and rigorous analysis. Having established the existence of some form of environmental degradation it remains open as to the extent of environmental change, its social origins and its significance for human health or ecosystem stability. Even then the answers suggested by scientific and sociological research are highly contestable. What is pollution?, what causes pollution?, what will its consequences be, for whom and when? are questions necessarily suspended in an open-ended debate.

In almost no other area of public is the accuracy of scientific argument more

keenly debated and its epistemological status so critically examined. The complexities and uncertainties of environmental science, and the range of differing opinion on almost every issue demonstrate with great clarity what philosophers of science have been arguing for some time. Science as a practice does not generate clear, unassailable descriptions of the world or accurate predictions about the future. Yet the outcome of these scientific debates will have enormous environmental, economic and political implications. Therefore, access to scientific knowledge, the skills to engage with the technical debate, the resources to fund and interpret research and disseminate argument have all become critical sources of political power. If you cannot demonstrate that a factory is producing pollutants, or that those pollutants are finding their way into people's bodies, and once in those bodies have toxic effects, then it is almost impossible to successfully argue for the environmental control of that factory. If someone makes that claim and you can mobilize research which disproves it or throws doubt upon its findings, then the case for control is fatally weakened. Science becomes a powerful political tool and the scientific community plays an important role in environmental politics (see Haas, 1990; Beck, 1992; Rowlands, 1994).

Liberal democracies are unfamiliar with the politicization of these kinds of debate. Their capacity to deal with them may not simply be a case of learning new skills, there may be structural obstacles to making these debates and this form of power democratically accountable. Practically - given a politics dominated by definitions and technical decisions - can representative institutions function as effective or legitimate organs of decision making? The accuracy of scientific argument is not easily debated in the context of parliaments where neither expertise nor time is readily available. While the outcome of these debates is intensely political, the dividing lines between different positions does not sit meaningfully with the lines of representation in most liberal democratic political systems. Differences of opinion and interpretation are most likely to occur between producers and consumers of environmentally problematic products, or between experts and the public - class, regional or denominational based parties hardly align with these cleavages. In any case, the majoritarian principles of representative institutions do not combine easily with the character of scientific

disagreements. A vote in the House of Commons simply cannot determine the rightness of an environmental or toxicological argument. Normatively, it can be argued that access to and control over scientific knowledge is so asymmetrically distributed between state and civil society, producers and consumers, experts and publics that the determination of environmental public policy is systematically skewed towards the interests of polluters rather than the public.

The uncertainty of environmental change combines with its temporal character to introduce further problems for liberal democratic politics (Pearce, 1990; Jacobs, 1991). It has become clear that the impact of pollution outlasts its initial moment of creation. Nuclear wastes will be with us for some time to come. Similarly it is well established that the impact of pollution is cumulative. Weakened ecosystems become less and less able to endure similar levels of pollution. Pollutants build up in concentration in the atmosphere, in the seas or in human bodies unable to excrete them. More recently, chaotic models of biological systems as well as observations of environmental change have suggested that cumulative change can give way to sudden, unexpected and extensive change - the progress of the ozone hole discussed in Section IV demonstrates this. What are the implications of enduring environmental degradation and the possibility of sudden and enormous change for liberal democratic polities?

One way of looking at this is to argue that the future course of environmental degradation will fall on a spectrum of outcomes ranging from the catastrophic to no change or danger at all - the pessimistic and the optimistic scenarios. In turn we can take up a response on a spectrum ranging from caution and pre-emptive action to business as usual where we make no changes. If the pessimistic predications on global warming are correct - and they may not be - we are looking at a pretty bumpy ride in the twenty-first century: increasing average global temperatures, major changes in climatic patterns, rising sea levels, shrinking polar ice caps, major coastal flooding, population movements and social turmoil in some places, desertification in others. These outcomes are not certain, but they pose a significant set of risks. There is, therefore, a case for pre-emptive caution in environmental policy making: big change now before we are forced to face

catastrophic consequences. This in turn rests on the idea that the interests of future generations, those that will actually have to live through such a situation, must be included in the calculations of contemporary decision makers. If we did not know which generation we were going to be born into would we accept as legitimate a political system that discounts the future and passes risks on through the generation? Many environmentalists say we should not accept such a system as legitimate (Barry, 1991). However, liberal democracies may have difficulty in incorporating this demand. Electoral competition and electoral cycles mean that democratic politics is rarely able to generate policies which look forward further than the next election. In the absence of a solid society-wide consensus on the inclusion of future generations' interests in policy making, liberal democracies provide few representative democracy who is going to represent the interests of those that have no vote?

Alternatively, political communities may choose to ignore the risk, continue with business as usual and opt to deal with environmental problems if and when they show up. If that is the outcome of a democratic decision-making process then the cautious will just have to lump it, and if the pessimistic predictions are wrong then all well and good. However, if the pessimistic predictions are right we will be in trouble. Many environmentalists argue that the only adequate response to this threat is, wholesale transformation of industrialized economies; affecting energy production, transport, agriculture, a shift to renewable resources and a generalized reduction in unnecessary consumption. Is it possible for liberal democracies to radically transform patterns of consumption and investment? Is it possible to divert sufficient capital into investments whose pay-off - if it comes at all - will only come 40 or 50 years hence? The question is whether the decision-making process in liberal democracies makes a cautious choice politically feasible or does the character of liberal democracy actually preclude some outcomes? It is taken for granted that democracies should institutionally preclude their own dissolution and the emergence of authoritarianism. Beyond this, their legitimacy has rested on the idea that they make space possible for a variety of different political projects to be pursued subject only to popular support and constitutional propriety. The risk of environmental

catastrophe and the political options it presents us with may sharply challenge this aspect of liberal democratic politics.

III. The globalization of environmental problems

1. What is environmental globalization?

There are three forms of environmental globalization - transboundary pollution, environmental interdependence, and the degradation of the environmental commons. Clearly, pollution and environmental degradation are neither impeded by nor acknowledge the existence and impermeability of any political and territorial jurisdiction - acid rain, a form of transboundary pollution, is a good example. Sulphur dioxides, generated in one place from the exhaust fumes of motor vehicles and the emissions from coal - and oil - based electricity plants, pass upwards into the atmosphere, are converted to sulphuric acids by their interaction with water in the atmosphere and then, as clouds and rain, are transported from their point of origin to wherever wind and climate take them. In the case of acid rain in Western Europe there are multiple national sites of pollution production and a multiplicity of destinations. Sweden, for example, receives acid depositions from Western and Eastern Europe, from its direct Scandinavian neighbours as well as Germany, the UK and the Baltic states. Thus, transboundary atmospheric pollution problems are often regional in their geographical form. It is only when they become inter - regional or transcontinental in their extent that we can consider them to be a form of globalization.

The separation of the place of creation of degradation and the impact of that degradation can be conceptualized as environmental interdependence. These kinds of interconnections are primarily biological in their form, although derived from social processes. A chain of causal, physical effects is set in motion in one place, transported physically to another place (e.g. acid rain through the air on the wind) or has its impact elsewhere through a long and complex chain of physio - chemical interactions (e.g. greenhouse emissions leading to altered climatic patterns).

We can add to this sense of social and political interconnectedness best captured by conceiving of globalization as the stretching and deepening of social relations. Consider the global politics and implications of population expansion. All environmental problems have a demographic dimension, for all other things being equal, more people means more pollution and resource consumption. Almost all contemporary population growth is occurring in the South. The environmental consequences of this are primarily located in the actual states experiencing rapid demographic change. However, there is a tendency for the consequences of those changes to spill over into the politics of other nations. Rapid demographic growth is a key factor in explaining the increasing immiseration of sub-Saharan Africa and the processes of desertification and soil decline. This has already spilled over into the growing economic problems of the region and its mounting international debts. In the future the demographic and environmental squeeze on the South may contribute towards political instability and migration, both of which will affect a widening pool of other nations, internationally and domestically.

While environmental degradation can be wrought upon highly localized and purely national environmental resources and ecosystems, it can also affect shared resources and ecosystems. Indeed, the entire planet can be viewed as a single interrelated ecosystem. The environmental commons, thus described, are those elements of the environment that are simultaneously used, experienced and shared by more than one state and under the effective jurisdiction or sovereignty of no one - the application of a singular national political authority or a singular private property owner is impossible. The atmosphere is the best example of this type of commons. It is a resource, essential for life, that immerses and exceeds every state and society. It is inconceivable that any one can effectively own the atmosphere and no one can be excluded from its usage, yet the consequences of any single action can have impacts of a highly unpredictable and volatile nature all over the planet. The American predilection for the motor car and profligate energy use entails a very large release of greenhouse gases into the atmosphere and a significant contribution to global warming. Thus we can establish a complex chain of causation between US transport and energy policy, the changing agricultural fortunes of

Bangladesh or sub-Saharan Africa and their internal politics. Decision on public expenditure on sea defences and desertification measures are tied to and dependent upon decisions made elsewhere about road building and energy efficiency. Politics is in effect stretched. As we already know this kind of intersection between two sets of domestic political forces and social change is nothing new. However, what distinguishes contemporary problems of the environmental commons and makes the application of the idea of globalization useful is that it alerts us to both the depths to which such interrelations reach inside national polities and the increasing number of separate national polities and policy areas drawn into the expanding web of stretched relationship - the deepening of spatially separate social processes or the increasing intensity of global and regional interactions.

2. Globalization of the environment and the transformation of liberal democratic politics

Environmental problems and their spatial organization are closely interconnected with the causal forces at work in their creation and the attempts to modulate them. Thus there is a fourth sense in which we can connect environmental matters with the ideas of globalization. This does not derive from the material extent, organization or form of environmental degradation and change but from the spatial characteristics of the social institutions that both generate environmental degradation and attempt to control or limit it. The origins and consequences of global and regional environmental problems intersect with global and regional economic, political and cultural institutions and processes. An example of each shows how the idea of globalization can be usefully brought to bear on the phenomena.

In the case of economics it can be argued that the steady diffusion of industrial mechanisms of production from North to South - a form of globalization - has led to a massive increase in the total capacity of the global economy to generate environmental pollutants and threaten global commons like the seas and atmosphere. In political terms it is clear enough that a range of institution and treaties have been established over the last 20 years which encompass a very large number of

countries, place significant limits on domestic political and economic practices and lock previously national centres of politics and administration, like departments or ministries of the environment, into global and regional networks of agenda building, policy formation and policy implementation. The recognition and estimation of environmental degradation is clearly linked to an expanding international network of scientists (or epistemic communities) and pressure groups whose arguments and analyses spread rapidly over the globe influencing purely domestic debates and environmental perspectives, as well as helping to forge a broader global or international consensus on the character, consequences and appropriate responses to shared environmental problems. To the extent that environmental degradation is caused by the intensification of global economic processes, recognized by transnational scientific or epistemic communities and controlled or modulated by international regimes or organizations, or regulated by international law, we can confidently talk of an increasing *globalization of environmental affairs*.

What are the likely impacts, normative and practical, of these processes of environmental globalization on liberal democratic polities? In what sense has there been a transformation in the conditions of liberal democratic politics? Liberal democracies are territorial democracies. It is assumed that citizens in a demarcated territory constitute a shared political community of fate. They elect national governments who are responsive to the electorate's interests and capable of delivering on their electoral promises. In theory national government is the only political institution that has the sovereign right to legitimately rule within a delimited territory and the actual political autonomy and capacity to do so. The globalization of environmental problems throws all of these assumptions into the air. First, the existence of the global commons and its collective ecological decline has generated an environmental community of fate far bigger than any single nation - state. This point is enforced by the existence of transboundary pollution and environmental interdependence. Thus both the rightful scope of the democratic political community and the extent of reciprocal obligations, responsibilities, and right can no longer be located exclusively at the level of a nation alone. Second, even if we restrict

ourselves to national political communities, the geographical scope of ecosystems and environmental degradation easily evades the sovereign reach of the largest nation - state. No state has the autonomous capacity to control the quality of its atmosphere or to prevent pollution arriving on the wind. Third, the sovereign legal entitlement to rule in a given domain has been compromised by the web of commitments, treaties and international legal obligations that states have acceded to. Fourth, the capacity of a polity to pursue an autonomous public policy is constrained by its necessary involvement in international environmental regimes where it must bargain with other states. However, in the one domain where a meaningful political community of environmental fate can be represented - international institutions - democratic accountability is particularly difficult to achieve. I shall explore these problems below in connection with the international response to ozone depletion and global warming.

IV. Ozone depletion

1. Ozone chemistry : the basics

Ozone is a bluish gas with a sharp and pungent odour. Its name is derived from the Greek for smell. Chemically it is a particular form of oxygen, made up of three oxygen atoms. Most ozone is concentrated in the mid - ranges of the stratosphere about 20-35 km above the earth's surface - the ozone layer - where concentrations rise a hundred-fold. The key environmental role of the ozone layer is its capacity to absorb ultraviolet (UV) light from the sun and prevent it reaching the earth's surface where it can cause considerable damage. At one time the science was hotly contested, but today it is thought that increasing levels of UV radiation are connected to increasing rates of human skin cancer, cataracts and immune system disorders. UV radiation also appears to have a widespread and dangerous impact upon aquatic life and terrestrial plant life.

Very little ozone is naturally produced on the earth's surface. Rather, stratospheric ozone is the product of a complex series of chemical reactions in the earth's atmosphere. The whole ensemble of reactions exist in a state of dynamic equilibrium in which other gases in the stratosphere act as catalysts of the reaction that breaks ozone down. Catalysts speed up chemical reactions but are not consumed themselves in the process. Thus every catalytic molecule can take part in the destruction of hundreds of thousands of ozone molecules before it is destroyed. These catalytic trace gases are naturally occurring and contain either hydrogen, nitrogen and chlorine, like nitrogen oxides and methane. In fact, the chemistry of stratospheric ozone consists of hundreds of interrelated reactions and reaction cycles. None the less, even at low levels of ozone concentration the absorptive capacity of the ozone layer has been sufficient to keep UV levels on the earth's surface within tolerable limits.

2. CFCs : origins and consequences

This is where CFCs of chlorofluorocarbons enter the picture. CFCs are carbon - based molecules in which one or more of the atoms binding onto the carbon is a halide, i.e. chlorine or fluorine (Benedick, 1991; Miller, 1995; Pason, 1993; Rowlands, 1994). They were first patented in 1928 by Du Pont and General Motors who had been seeking a replacement for the highly volatile materials previously used in refrigeration. The chemical and physical properties of CFCs made them ideally suited to this and many other industrial uses. They are extremely stable, inert, reasonably easy to produce and non - toxic. CFCs came to be used in not only refrigeration but in air conditioning systems, as industrial solvents, as the propellant for aerosols, for blowing foam and use in fire extinguishes.

Global production of CFCs doubled every five years through to the 1970s. Nearly half of global production was in the USA and half of that was Du Pont alone. One or two significant producers were located in the UK, France, Germany, Italy and Japan with a smattering of smaller plants in the USSR, Greece and Spain. Over 50 per cent of output was consumed in aerosols. It was only in the early

1970s that these chemicals were first thought to be environmentally problematic. In a seminal paper by Rowland and Molina, the authors argued that very long-lived CFC molecules must, after use or disposal, find their way up into the stratosphere. Here they would release some of their fluorine and chlorine atoms which would act as very effective catalysts in the breakdown of ozone thus diminishing ozone concentrations. This in turn would increase the volume of dangerous UV light reaching the earth's surface, which would normally be absorbed by ozone breakdown reactions (Rowland and Molina, 1974). This triggered a series of national and international debated and political struggles over the production and use of CFCs.

Although significant early action was taken by the environmentally precautionary governments of Sweden, Norway and the Netherlands the political focus was in the USA, which was the biggest producer and consumer of CFCs. On one side the US environmental movement, concerned scientists and the Natural Resources Defence Council called for an immediate ban. Du Pont, the company with the biggest stake in their retention, argued that the scientific evidence was no more than hypothesis at the stage and should evidence be forthcoming they would cease production. It is important to note that at this stage the empirical evidence for levels of overall ozone depletion was lacking and no one had predicted or located the existence of ozone holes - areas of the stratosphere where ozone levels were peculiarly low. A turbulent and highly publicized conflict resulted in a US ban on CFC use for all except essential products. Moreover, US and Scandinavian pressure led to the first international meeting on ozone depletion, convened by the UNEP (United Nations Environment Programme) in Washington in 1977. This set up a permanent monitoring body, the CCOL (Coordinating Committee on the Ozone Layer), which acted as the international co-ordinator and clearing house of ozone chemistry and ozone depletion research for the next eight years.

3. From Vienna to Montreal

Progress remained slow for the following decade as the science remained uncertain and the lobbying powers of US and European CFC producers coalesced in the

powerful Alliance for Responsible CFC Policy. In 1981, at the behest of the Swedish government, the UNEP called a further international convention on the ozone layer with a view to creating an international regulatory regime that would limit CFC use and production across the world. Meeting in 1982 and 1984 no agreement was possible between supporters of CFC control (small producer and consumer states with strong environmental movements like Sweden and the Netherlands) and opponents (large producer and consumer states). British, German, French and Japanese delegations were staffed, in part, by industrial representatives whose views dominated on technical and scientific committees. The leverage and presence of environmental non-governmental organizations was minimal and under Ronald Reagan's anti-environmentalist presidency the power of the EPA (US Environmental Protection Agency) to lead US negotiating positions was much diminished. A framework convention was signed in Vienna in 1985 only committing the parties to further research and action to identify the scale of the problem. What turned events around, primarily, was a decisive shift in the scientific debate.

Data on stratospheric concentrations of ozone had been recorded for a number of years by the British Antarctic Survey based at Halley Bay. In 1985 they released data which unequivocally demonstrated the existence of a seasonal ozone hole over the Antarctic ice sheets. While industrial representatives continued to dispute the evidence the balance of power began to shift away from the producers. The debate centred around two technical committees established by the UNEP after the Vienna convention. Meeting through 1985 and 1986 national governments began to adopt a different attitude to the CFC industry, environmental NGOs became more politically effective and the US delegation took a significant leading role in pushing negotiations forward. A split began to develop between US and European producers, with Du Pont accepting the case for controls on the growth of CFC production and investing heavily in CFC substitutes. Environmental NGOs and European Green parties also began to mount strong and very effective domestic campaigns against CFC use in key producer states like Britain and Germany. Thus by the time the Montreal convention had begun, in late 1987, a very significant weight of opinion had formed behind the creation of a much more stringent international regime that would combine

binding legal commitments to action, processes of verification and timetables for implementation. Intensive negotiation produced the Montreal Protocol which required signatories to cut production of the five main CFCs by 50 per cent from 1986 production levels by the year 2000. In addition tight trade restrictions were placed on signatories preventing CFC imports. Further large cuts in production were planned for the early 1990s and a periodic reviews and updating procedure of the protocol established.

4. Montreal and London conventions : democratic implications

The Hally Bay observations stimulated and informed a NASA led scientific project through 1986 and 1987. The original Hally Bay observations were confirmed and plausible mechanism for ozone depletion outlined. Previous work on ozone chemistry had been predominantly one-dimensional assuming an equivalence of conditions across the earth's surface, but results indicated a particularly intense level of Antarctic ozone depletion. Simply put, in the winter months a stable vortex of rotating air forms over the South Pole which keeps air trapped in the region. Within the vortex stratospheric temperatures are extremely low and encourage the formation of ice in the form of polar stratospheric crystals. These provide a surface on which catalytic ozone depletion is speeded even further while the vortex ensures that ozone-rich air from more temperate regions cannot flow in and replenish lost ozone. Thus ozone levels fall precipitously.

This evidence began to emerge soon after the Montreal meeting. It broke the stranglehold of the global chemical industries' scepticism and the willingness of governments to support them in international negotiations. By mid 1988 Du Pont was supporting a global phase-out of CFCs and it was joined by the European chemical industry in late 1988. By this time Du Pont had sunk over \$40 million into the development of CFC substitutes. The UNEP re-convened international negotiation on updating Montreal. It was only at this point that developing nations began to be involved in the negotiations in any substantive way. By the late 1980s CFC production was beginning to expand in the South. China, India and other

large southern states had to be incorporated because their potential CFC use was huge. However, these states feared that a CFC phase-out would leave their chemical and refrigeration industries dependent on Western corporations who controlled the CFC substitutes. The London Revision to the Montreal Protocol, signed in 1990, provided for a complete phase-out of CFC production by the year 2000 as well as more stringent controls on other ozone depleting chemicals. It provided for a permanent secretariat and the development of monitoring and non-compliance procedures. Its most innovative features were a commitment to North-South technology transfer in CFC replacements and a financial instrument that would fund those transfers.

Ozone depletion is a clear example of the degradation of the global commons (although with an uneven geography of origins and consequences). It is a problem that exceeds the effective reach of any single state and generates an environmental community of fate that cuts across state borders. It has its roots in an earlier failure to predict the environmental consequences of a seemingly benign technology, consequences that seemed to suddenly shift towards the catastrophic. It is also worth noting that those areas most at risk from ozone depletion were Northern Europe and Australasia. However, CFC reduction, despite the continuing and unpredictable threat of ozone depletion, is a success story. Liberal democratic governments who were the main players in most of the international negotiations were able, in response to both scientific argument and considerable popular pressure, to co-ordinate national policies through an international regime for phasing out the production of CFCs. In so doing they were both responsive to the interests of current and future generations and able to circumvent the problems of national governments in a globalized political environment. The early stages of the struggle indicate the privileged position of producers and governments over consumers and publics in the creation, use and dissemination of scientific argument. Though as the NASA research shows when the evidence becomes more incontrovertible, industry's own commitment to the 'truth' of science acts against it. Du Pont was forced by its own rhetoric to abandon CFC production. The financial and technology transfer elements of the London convention show that it is possible for the interests

of weaker states in the South to have some purchase in international institutions - for a global ban on production can be broken by the weakest link in the chain. However, these successes may not be repeatable. Only a very small number of chemicals, products, technologies, companies and jobs were at stake in only a few countries. The resource transfers required were small scale and thus the distribution of environmental and economic 'bads' were quite minimal. The science, for all its complexity, was focused enough that consensus was possible. None of these factors apply to the case of global warming considered in the next section.

V. Global warming

1. Global warming : the basics

Global warming and the enhanced greenhouse effect are often used interchangeably (Legget, 1990; Nilsson and Pitt, 1994; Rowlands, 1994; Young, 1994). In this paper I use the greenhouse effect to refer to the physio-chemical processes by which the atmosphere retains heat and keeps the earth appreciably warmer than it would otherwise be. I use global warming to refer to the climatic consequences of transformations in the gaseous composition of the atmosphere produced by human action. The idea that the earth's atmosphere acted like the panes of glass in a greenhouse - letting sunlight in but not letting as much out, thereby heating the interior - was first proposed by Fourier in the early nineteenth century. The actual interaction of sunlight with the earth's surface and atmosphere is very complex, but the basic principles are simple. Sunlight that reaches the earth is a mixture of many different wavelengths, visible, infra-red and ultraviolet. Some of that light is reflected back out into space immediately, some is absorbed by the earth's surface and oceans and some is reflected back but in the form of infra-red light - this light and the energy it carries is trapped by gases in the earth's atmosphere and warms the planet. In the late nineteenth century the Swedish meteorologist Arrhenius argued that the burning of fossil fuels released an increasing level of carbon dioxide into the earth's atmosphere. Carbon dioxide is the most important

gaseous element of the greenhouse effect. Over time the accumulation of carbon dioxide in the atmosphere should lead to more heat being trapped and an overall rise in the ambient temperature of the atmosphere and the earth's surface. Moreover, it was obvious enough that should temperatures rise, then the earth's climate, patterns of cloud formation, rain fall, wind and sea currents would all change as well.

Despite the scientific pedigree of the argument it raised no political or environmental alarms for another 70 years. Indeed climatologists were arguing in the 1960s that the natural variations in the earth's climate due to the changing nature of the earth's orbit round the sun were more likely causes of major climatic change. None the less, concern amongst climatologists and international environmental organizations began to mount. The prospect of global warming was mooted at the first major UN sponsored international environmental conference at Stockholm in 1972 and was echoed, with greater scientific data, at the first world climate conference in 1979.

2. The road to Rio : global warming in the 1980s

Through the early 1980s scientific research demonstrated that the correlation between changing global temperatures in the past and atmospheric concentrations of carbon dioxide was closely linked. Energy researchers demonstrated not only that the rate of fossil fuel use was climbing but levels of carbon dioxide in the atmosphere had been on an exponential path since the end of the Second World War. They were approaching levels of atmospheric concentration that were quite off the scale of recent geological experience. These debates coalesced at a series of specialist seminars amongst increasingly politicized climatologists and atmospheric scientists and government agencies organized under the auspices of the UNEP in 1987. The growing body of evidence and a recognition of the profundity of ecological and social change that might be on the cards coincided with a series of more contingent meteorological and political events. 1987 and 1988 proved to be exceptionally hot years with seemingly freak weather patterns. Green parties in

Europe and environmental NGOs in the UK and the USA were nearing a peak of influence and support while the increasingly successful Montreal Protocol on CFCs suggested a model of international political and scientific co-operation.

Given the complexity and uncertainty of the scientific debate the UNEP and WMO (World Meteorological Organization) took the initiative and established the IPCC (Inter-governmental Panel on Climate Change). This consisted of a global network of leading institutes and individuals in climatology, oceanography and the atmospheric sciences. It was divided into three working groups which were to investigate, assess and synthesize the evidence and arguments on the origins and character of the greenhouse effect, the potential risks and implications of global warming and policies and proposals for dealing with those risks.

The results of the IPCC's research were contested on every count but the strongest area of research, on which most consensus was achieved, was on the origins and existence of global warming. Temperature records suggest that a process of global warming is occurring. Estimates of the likely rate of change vary, but suggest something around 0.5° C per decade for the next 40 or 50 years. This, of course, is an average global temperature, some areas would experience much sharper rises, others less or none at all. Given the rate and scale of change the cause is unlikely to be due to slower natural forces or cycles. The greenhouse effect is the only plausible explanation available. Concurrent with global warming there has been a steady build-up of greenhouse gases in the earth's atmosphere. With only 15 per cent of the world's population, the West contributes about 80 per cent of global greenhouse emissions (OECD, 1993). This consists of carbon dioxide (CO_2) produced by burning fossil fuels for electricity production, industrial uses and transport - primarily motor vehicles - and the burning of rainforests. The decline in rainforests also diminishes the earth's capacity to absorb CO_2 for plant photosynthesis. Other contributors to the greenhouse effect include sulphur and nitrous dioxide which also cause acid rain, and methane - primarily released by decomposing waste and agriculture. Of all environmental problems uncertainty of impacts is, perhaps, greatest with global warming. Changes are likely to shift climate patterns, rainfall

levels, and wind directions all of which interact with each other in complex and unpredictable ways. Increasing temperatures may melt the polar ice caps leading to rising sea levels and coastal flooding or a diversion of the main ocean currents. With an increase in area the sea may have an increased capacity to absorb carbon dioxide, slowing global warming - we still do not know.

As a consequence, to date there has only been limited political agreement on what measures should be taken, or whether measures should be taken at all, on the basis of the IPCC's work during 1989 and 1990. Preparatory discussions leading up to the Second World Climate Conference descended into arguments around the podium at Sundsvall in 1990. However, political paralysis was less to do with scientific disagreements and everything to do with the enormous differences between states depending on their economic interests and the perceived environmental risks. The Gulf oil states were implacable opponents of all restrictions and commitments to reduce emissions, not far behind came the USA. India and China were both cautious about restrictions, leading developing country pressure for the West to raise its environmental commitments and make financial transfers available to the South in return for reducing or controlling emissions. The Association of Small Island States - those islands, mainly in the Pacific and Caribbean most immediately and perilously threatened by rising sea levels - pushed hardest for some kind of agreement. Indeed such were the differences that the climate conference's only important decision was to establish negotiations for creating an international convention on climate under the spines of the General Assembly of the UN. These negotiations finally generated a Convention on Climate Change that was signed at the 1992 UN Conference on Environment and Development (UNCED) in Rio de Janeiro.

The Framework Convention, as it is known, was signed by 155 states. If nothing else it established a permanent international secretariat for monitoring and disseminating research on global warming and provided for a regular series of Conferences of the Parties at which more substantive regulation could be established. It established the basic principle that the northern states needed to reduce their

greenhouse emissions, though it only committed them to stabilization of existing emissions by 2000. It also established the principle that the control of emissions in the South would be tied to financial transfers from the North. However, given that the IPCC's conservative estimates suggested that to merely stabilize the current rate of change an immediate 60 per cent reduction in greenhouse emissions is required and that increase of economic growth, electricity production, car use and thus greenhouse emissions is exponential in the industrializing areas of the South - the practical response was, at best, minimalist.

3. Beyond Rio : global warming and democratic politics

Since the 1992 conference in Rio de Janeiro the scientific debate on global warming has hardened. The most recent IPCC reports confirm and entrench earlier arguments and even the most recalcitrant of opponents - particularly the scientific lobby funded by the oil and motor industries in the USA - has been forced to tone down their scepticism. Political responses, however, have remained muted. Industrialization and growing emissions have proceeded apace in the South. In the North, attempts to stabilize emissions have been achieved or almost achieved as much by the run down in economic activity of the early 1990s as concerted government measures. Comprehensive proposals like carbon taxes have been defeated at both the national and European levels. US energy taxes have remained alarmingly low and the global electricity industry remains committed to increasing outputs rather than energy conservation. Everywhere attempts to control levels of car use are failing. Progress at an international level has been little better. In 1995 the parties to the Framework Convention met in Berlin in an attempt to firm up the commitments to emission stabilization and reduction. This resulted in over a week of procedural disputes before any new agreements could be established. The Berlin Mandate established a commitment by the parties to negotiate real reductions in emissions by 1997, based on agreement that current commitments were woefully inadequate.

What are the democratic implications of these events at the level of the nation - state and the international state system? Global warming presents politics with nearly

all of the problems outlined in Sections II and III. The existence and likely course of global warming has only been revealed by scientific work, the results of which are highly contested. Global warming presents us with a future in which there may be very considerable environmental 'bads': the process of economic growth becomes more problematic; established patterns of consumption and investment in the North require a radical change; and the South will only be able to achieve economic development without very damaging environmental consequences if it is able to pursue a mode of development radically different to that which the North took and with access to northern capital and technology. It is the global environmental problem par excellence, no state or group of states can resolve it alone, it effects almost everyone, everywhere.

So far, at the national level, no liberal democratic state has been able to commit itself to much more than stabilizing emissions. This suggests that there are structural problems associated with taking the 'cautious' policy option and including the interests of future generations. No mainstream political party has been electorally successful, or thinks it can be electorally successful, if it argues for the kinds of measures cuts in emissions would require. These are infinitely more complex and politically significant than the regulation or abolition of a single chemical, technology or industrial sector. They include, for example, increases in energy taxes and major measures to control car use which would impact on every economic sector and group of the population. At the international level, the question of democracy is problematized by the issue of efficacy. In international institutions where states are the key representatives and consensus is required for decisions to be taken the divergence of state's interests is so great (high and low energy users, creators and potential victims of global warming, states that have reached their peak energy use and those that are rapidly growing) that significant policy measures have been impossible to achieve. The absence of representatives of environmental and future interests makes such measures even less likely to achieve. The incapacity of institutions to generate effective policy programmes is unlikely to do much for their democratic legitimacy or institutional entrenchment.

VI. Democratic conclusions

Drawing up a balance sheet that registers the impact of global environmental problems on democratic politics requires us to look at two different but interconnected sets of questions. The first set of questions looks at the impact at the level of individual nation-states. We need to ask, how effective have liberal democratic states been in generating solutions to environmental problems in general and global environmental problems in particular? To what extent are the successes and failures of this enterprise related to either the national or territorial character of these states or the democratic or representative qualities of these states? Have the conditions of politics been transformed so greatly that their democratic status is in question? As a coda to these questions we might also ask whether authoritarian polities have proved any more successful than democratic ones in dealing with these problems. The second set of questions looks at the international institutions that have emerged in response to the national-territorial limitations of nation-states - democratic or otherwise. We need to ask whether international environmental institutions have been more successful in generating environmental solutions than national institutions. Moreover, where they have done so, has that success been bought at the cost of centralizing power and circumventing democratic procedures? I deal with these two sets of questions in the following sections.

1. Liberal democratic nation-states : environmental efficacy and territorial limitations.

In Section II I asked whether the liberal democratic component of liberal democratic nation-states generated problems in dealing with environmental degradation, for example, dealing with uncertainty. I argued that liberal democracies have structurally determined difficulties in generating and implementing suitable policy programmes. When faced with global problems that pose immense environmental risks two difficulties stand out. First, there are problems of the long term. Environmental degradation, whether states respond to it or not, implies a complex distribution

of costs and benefits within and between generations. In representative systems there are few immediate requirements to take into account the interests of future generations. The electoral cycle of parliamentary government reinforces environmental problems means that those who do seek to represent the interests of future generations are constantly undercut by electoral competition from those representing the interests of the present generation. Second, whether states respond to environmental problems now, never, or some time in the future, the scale and scope of those problems means that there will be very substantial costs and benefits to be politically apportioned. While the precise dimensions of a sustainable response to global warming are not finalized, we can be certain that it will entail a comprehensive restructuring of agriculture, energy and transport sectors, as well as aggregate patterns of production and consumption with significant changes in taxation, public expenditure and employment. Such a policy programme would create a significant number of short-term losers, while the main beneficiaries of such a transition would be absent. It is not clear at all whether liberal democracies will be capable of creating or sustaining the kinds of political support required to put this level of inter-generational distribution into action.

In Section III I looked at the ways in which the national component of liberal democratic nation-states made effective resolutions to environmental problems even more difficult. The existence of transboundary pollution, environmental interdependencies and the degradation of the global commons have meant that there are many environmental communities of fate who demographically and territorially encompass and cut across national political communities. As a consequence the legitimacy and efficacy of national liberal democratic states is directly challenged. Their efficacy is challenged because it is clear that the actions of individual states will rarely be sufficient to protect the environmental interests of their own citizens. Their legitimacy is challenged, for if the election of a national government cannot deliver on basic environmental security, then why vote?

For all of these deficits there are credits on the democratic balance sheet. First, liberal democracies have been sufficiently open to new currents of public concern that the wave of environmental degradation, and increasing concern over that

degradation, has been channelled into new government machinery, legislation and funding for environmental protection. Second, liberal democracies have provided the organizational space for Green parties and a host of activist, informational, research and campaigning bodies to emerge and for some pressure to be placed on the environmental programmes of conventional political parties. In turn, this has forced a reassessment of the boundaries of previously depoliticized arenas - like technological development and medical research - opening them to democratic debate.

Perhaps the decisive entry on the balance sheet is not against the account of liberal democracy, but against the performance of authoritarian regimes. While both environmental legislation and environmental movements have emerged under authoritarian regimes of both left and right, it is incontrovertible that they have proved much more hostile territory for environmentalists. While the case for environmental protection and the interests of future generations is difficult to implement under liberal democratic polities, it is doubly difficult when environmental information is impossible to obtain, where no electoral pressure can be brought to bear on politicians, where the rule of law, environmental and other, is systematically bypassed and where environmental movements are harassed, controlled, censored or eradicated. In that regard, liberal democracies commend our attention for being the least worst environmental option.

2. International environmental institutions : environmental efficacy and democratic legitimacy

In response to the evident territorial and political limitations of the nation - state - be it liberal democratic or authoritarian - Section III argued that a plethora of international institutions have been created to provide collective solutions to environmental threats. Sections IV and V examined two in particular - the array of ozone and CFC related protocols and the emerging cluster of institutions and regulations monitoring and governing global warming. Again, we need to ask whether these institutions can practically deal with environmental problems. Second, we need to ask whether they do so on a democratic basis. Normatively, if not practically,

it is one thing to hand political power from national to international institutions. It is another to pass that power from democratic nation - states to undemocratic and unaccountable international institutions. At the very least we need to be clear about the trade - off involved.

As far as practicality and efficacy goes the history of ozone depletion and CFC regulation lies on the positive side of the balance sheet. The successive negotiations and protocols of the 1980s and 1990s enabled a common international framework for negotiations to emerge and aided the establishment of a scientific consensus in the face of uncertainty. On the basis of this it proved politically possible to transform the production and consumption of CFCs, first in the West and then through new financial mechanisms in the South. However, the speed of negotiations when measured against the pace of environmental degradation looks alarmingly sluggish and the relative simplicity of the politics of ozone depletion (few producers, possible substitutes, many non - essential uses) are unlikely to be replicated in other situations.

The case of global warming illustrated some of the reasons why international environmental institutions have so far been unable to provide solutions to global environmental problems. In some ways these are the same problems encountered by nation - states. Agreement on the scope and scale of the environmental threat has been difficult to achieve. Similarly, there has been profound disagreement on who has been responsible for creating the problem and the extent to which past contributions to global warming should be included in future calculations of redress. The implications of global warming in terms of both environmental costs and the costs of transforming large economic sectors like energy, agriculture and transport are so large that agreement on the distribution of those costs becomes complex and difficult. Different states and different economic sectors within those states have radically different interests which are not at the moment amenable to negotiation. Even where agreement on costs and risks has been possible, the international institutions have neither the moral weight nor practical executive power to force compromises, extract significant concessions from participants or take independent action. On all these counts nation - states retain an effective veto through inaction and indecision should they choose to. No mechanism exists for

forcing recalcitrant states into line.

The democratic status of these international institutions is debatable. Policy discussion and negotiations are invariably arcane and under-reported. Hidden within the vortex of international negotiations national governments are rarely under significant domestic pressure from political parties or environmental campaigns. The space for environmental NGOs within these institutions though opening out is still small. No meaningful mechanisms exist through which the opinions of national publics or the entire global community of environmental fate can be registered or tested.

Faced by both the impending threats of catastrophic environmental degradation and the intractable political problems of conducting an enlightened environmental policy in a democratic polity - be it national or international - some have speculated that environmental sustainability might require the creation of benign ecological dictatorships. Authoritarian polities and authoritarian international institutions would be able to force through the necessary but unpalatable changes required to bring national and international economic activity within the pale of environmental sustainability. This argument is raised more often by opponents of the environmental argument than by its supporters. None the less, if environmentalist cannot win, nationally or internationally, under democratic auspices, is there a case for 'ecofascism'? It seems to me difficult to imagine the sociological composition of an authoritarian environmentalist coalition, all the usual supporters of authoritarianism - like the military, landowners, big business, state bureaucracies, etc. - would make extraordinary bedfellows for contemporary environmental coalitions. In any case, authoritarianism, however ecologically benign, is a form of regime deeply unsuited to tackling environmental questions. While it may be capable of enforcing unpalatable social and economic change it is unlikely to be able to deal with the uncertainties of environmental policy. This requires that institutions and elites remain reflexive, critical and sceptical, open to examination and argument. There is not, and cannot be any monopoly of truth on assessing environmental threats and responding to them. The less one consults and the more one silences opposing voices, the more likely it is that bad decision will be made, defended and entrenched. In terms of environmental degradation, such inflexibility becomes increasingly costly. I see

no reason to trust in the benevolence or wisdom of democratic politicians on these questions, I see even less reason to entrust authoritarians of any hue.

It is clear that the territorial dimension of contemporary liberal democracy makes any kind of national response inadequate - democratic or not. Global and regional environmental problems require global and regional institutions and legal frameworks to resolve or mitigate them. Some from within the liberal and realist traditions would argue that nation-states should cede a minimum of sovereign authority to them, using them predominantly as frameworks in which bargaining between national interests can be made more rational. I would argue that such a programme would make precautionary politics at a global level impossible to implement, and that it is no longer normatively justifiable for states - who have no autonomous capacity to meet these problems - to hang on to the fiction of sovereignty that precludes them from actively tackling these threats.

In terms of this paper, global environmental problems require a cosmopolitan model of geo-governance to resolve them. Beyond the territorial dimension of democratic responses there is a need both nationally and internationally for more democracy and more substantive democracy. First, because the weight of numbers of those threatened by - rather than profiting from - environmental degradation can only overcome the massive economic and political capital of environmentally problematic interests through electoral and participatory measures. Second - and somewhat at odds to the first argument - because cutting the Gordian knot of environmental politics - persuading the powerful and the wealthy to trade both for the interests of the future and the poor - cannot be achieved on the basis of a politics of interests alone (Habermas, 1991; Goldblatt, 1996). At some point the politics of moral choice must intervene. The only possible context for making such a transformation is one in which political decision making is grounded in wide - ranging, open discussion in which all points of view are recognized in which all interests are given equal standing and in which the inequitable distribution of other forms of power is laid to one side. Such a polity would indeed be democratic, radically democratic. Whether it would still be liberal democratic, what its institutional form would be and whether it can be created at a national or an international level are other matters entirely.

References

Barry, B.

1991. "Justice between Generations." in *Liberty and Justice: Essays in Political Theory* 2. Oxford: Oxford University Press.

Beck, U.

1992. *Risk Society: Towards a New Modernity*. London: Sage.
1995. *Ecological Politics in an Age of Risk*. Cambridge: Polity Press.

Benedick, R.

1991. *Ozone Diplomacy: New Directions in Safeguarding the Planet*. Cambridge, Mass.: Harvard University Press.

Doherty, B. and M. de Geus (eds.).

1996. *Democracy and Green Political Thought*. London: Routledge.

Goldblatt, D.

1996. *Social Theory and the Environment*. Cambridge: Polity Press.

Hass, E.

1990. *When Knowledge is Power*. Berkeley: University of California Press.

Habermas, J.

1991. "What Does Socialism Mean Today?" in Blackburn, R. (ed.). *After the Fall*. London: Verso.

Jacobs, M.

1991. *The Green Economy*. London: Pluto.

Legger, J. (ed.).

1990. *Global Warming: The Greenpeace Report*. Oxford: Oxford University Press.

Miller, M.

1995. *The Third World in Global Environmental Politics*. Milton Keynes: Open University.

Nilsson, S. and D. Pitt.

1994. *Protecting the Atmosphere: The Climate Change Convention and Its Context*. London: Earthscan.

OECD.

1993. *The State of the Environment*. Paris : Organization for Economic Co-operation and Development.

Parson, E.

1993. "Protecting the Ozone Layer." in Hass, P. et al. (eds.). *Institutions for the Earth : Sources of Effective International Environmental Protection*. Cambridge, Mass. : MIT Press.

Pearce, D.

1990. *Blueprint for a Green Economy*. London : Earthscan.

Robinson, M.

1992. *The Greening of British party Politics*. Manchester : Manchester University Press.

Rowland, F. and M. Molina.

1994. "Stratospheric Sink for Chlorofluoromethanes : Chlorine Atom-Catalyzed Destruction of Ozone." *Nature* 249.

Rowlands, I.

1994. *The International Politics of Atmospheric Change*. Manchester : Manchester University Press.

Vogler, J.

1995. *The Global Commons : A Regime Analysis*. London : Wiley.

Wagner, P.

1996. *Environmental Activism and World Civic Politics*. New York : State University of New York Press.

Weale, A.

1992. *The New Politics of Pollution*. Manchester : Manchester University Press.

Yearley, S.

1996. *Sociology, Environmentalism, Globalization*. London : Sage.

Young, O.

1994. *International Governance : Protecting the Environment in a Stateless Society*. Ithaca : Cornell University Press.