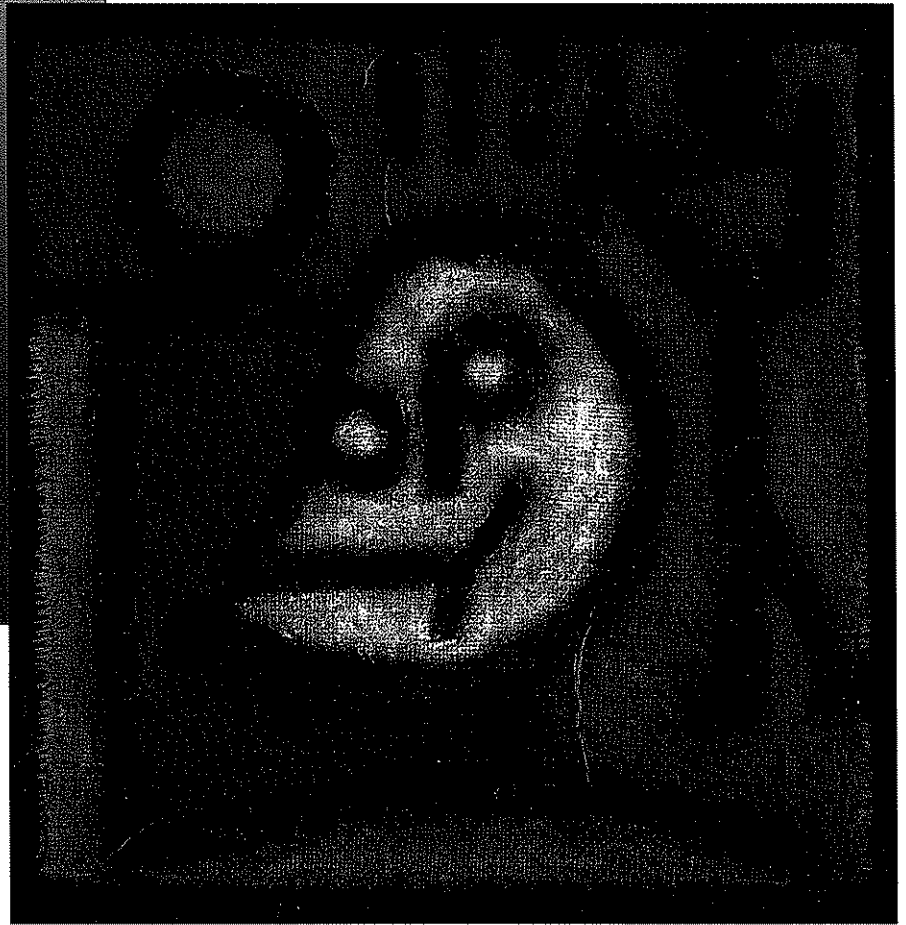# Risk, Environment & Modernity

Towards a New Ecology

edited by
Scott Lash, Bronislaw Szerszynski
& Brian Wynne

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EDITOR: Mike Featherstone, *University of Teesside*

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1996

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Preface

This book arose out of an international symposium – 'The Risk Society: Modernity and the Environment' – organised at Lancaster University in May 1992 by the Centre for the Study of Environmental Change (CSEC) and the Department of Sociology. The symposium was founded on a critical examination of the perspectives of Ulrich Beck and Anthony Giddens, focusing on modernity, risk and the cultural dimensions of contemporary environmental issues. It occurred at a time when dominant understandings of risk and environmental issues were undergoing what many at the symposium felt to be an unreflexive shift towards a highly globalised, scientised and universalistic idiom.

The Lancaster meeting brought together for the first time a range of European social theorists and scholars interested in these issues, not only as academic fare but also in terms of their profound importance to late-modern society, and to the turbulent debate over the meaning of European Union. The book is inspired by a shared conviction that more creative intellectual work is needed if we are to engage fully with the social, cultural and political dimensions of these issues, dimensions whose complexities are being obscured by the dominant modes of thought in policy and academic circles.

We are grateful to our authors for the work and commitment they have shown in responding to our editorial efforts to offer a more coherent framework of debate than would be offered by a simple collection of papers. We are also grateful to those many symposium participants from all parts of Europe whose ideas and contributions do not appear as chapters. Thanks are also due to Anne Stubbins for her highly effective organisational support, and to Robert Rojek at Sage for his continued interest and calm reassurance. The UK's Economic and Social Research Council provided funding for the symposium, as well as for CSEC's ongoing research programme on Science, Culture and the Environment. This and the continuing intellectual support of Robin Grove-White and other colleagues in CSEC, together with that of members of the Department of Sociology, and the Lancaster Cultural Change Network have played a crucial role in making this volume possible.

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ECOLOGICAL MODERNISATION AS CULTURAL POLITICS

Maarten A. Hajer

In his celebrated study of the US conservation movement around the turn of the century, Samuel Hays (1979) describes how the popular moral crusade for conservation of American wilderness paved the way for a group of experts that, under the veil of working for conservation, advanced their own particular programme. These 'apostles of efficiency' did not share the somewhat sentimental attitude towards wilderness that was typical of the predominantly urban movement for conservation. Above all, they were interested in applying new techniques of efficient resource management in introducing new forestry practices or in constructing and experimenting with the latest hydroelectric dams. For the American urbanites wilderness had a deeply symbolic meaning. Trees and mighty rivers were the icons of the alleged moral superiority of nature that stood in sharp contrast to the bitter reality of a rapidly industrialising society. For experts like Gifford Pinchot and his colleagues, in contrast, wilderness was a nuisance and nature was a resource: trees were merely crops and rivers were to be tamed and tapped. For the urbanites nature had to be preserved; for the experts nature had to be developed.

The story is instructive in several respects. Firstly, it shows that 'our' ecological 'problematique' most certainly is not new. The negative effects of industrialisation for nature have been thematised time and again over the last 150 years. Yet characteristically the public outcry focuses on specific 'emblems': issues of great symbolic potential that dominate environmental discourse. Examples of emblems are deforestation in the mid-nineteenth century, wilderness conservation (USA) and countryside protection (UK) at the turn of the century, soil erosion in the 1930s, urban smog in the 1950s, proliferation of chemicals in the early 1960s, resource depletion in the early 1970s, nuclear power in the late 1970s, acid rain in the early 1980s, followed by a set of global ecological issues like ozone depletion or the 'greenhouse effect' that dominate our consciousness right now. Given this sequence of issues it is better to refrain from speaking of today's predicament in terms of 'our ecological crisis' (which suggests it is time and space specific) and to speak of the *ecological dilemma* of industrial society instead.

Secondly, if we accept the thesis that environmental discourse is organised around changing emblems, we should investigate the repercussions of these subsequent orientations of the debate. After all, emblems mobilise bias in and out of environmental politics. They can be seen as specific discursive constructions or 'story lines' that dominate the perception of the nature of the ecological dilemma at a specific moment in time. Here the framing of the problem also governs the debate on necessary changes. In the case of the US conservation issue the prevailing story line framed the environmental threat as a case of 'big companies' that tried to destroy the American wilderness and rob 'the American people' of something that was constitutive of its national identity. This then paved the way for the state-controlled technocrats who established 'national parks', and seized control over rivers and pastures in the name of the common good. Hays's reinterpretation of the history of the conservation movement illuminates the often disregarded fact that technocrats subsequently used their brief to implement a comprehensive scheme of 'scientific resource management' in which wildlife and nature were largely made subordinate to their concern about achieving optimal yields, thus directly going against the original intentions of the popular movement. The word 'conservation' remained central, yet its institutional meaning changed radically. Ergo: ecological discourse is not about the environment alone. Indeed, the key question is about which social projects are furthered under the flag of environmental protection.

Thirdly, the story of the US conservation movement illustrates the complex nature of what is so often easily labelled the 'environmental movement'. Here the term 'movement' leads astray. Hays's narrative is in fact about not so much a movement as a bizarre coalition that comprised at least two rather distinct tendencies: a popular tendency that was morally motivated, and a technocratic tendency organised around a relatively confined group of experts, administrators and politicians. The important thing is that both had their own understanding of what the problem 'really' was and what sort of interventions could or should be considered as solutions. Nevertheless, together they constituted the social force behind the changes that were made. Hence, instead of speaking of a movement, we would be better to think in terms of 'coalitions'. And, as the above indicates, these coalitions are not necessarily based on shared interests, let alone shared goals, but much more on shared concepts and terms. We therefore call them 'discourse-coalitions' (see Hajer, 1995).

Fourthly, in environmental debates we can often identify implicit ideas about the appropriate role and relationship of nature, technology and society that structure implicit future scenarios. Hays sees a dialectical relation between the public outcry over the destruction of the American wilderness and the implicit critique of industrial society. Nature symbolised the unspoiled, the uncorrupted or the harmonious which was the mirror-image of the everyday reality of Chicago, Detroit or Baltimore at that

time. The popular movement wanted to save nature from the effects of industrialisation but did not address the practices of industrial society head on, focusing instead on the effects on nature. In the end it thus paved the way for a programme that focused on the application of new technologies and scientific management techniques to 'conserve nature'. Here the concern about the immorality of society was matched by a renewed appeal to forms of techno-scientific management that were very similar to those industrialistic practices that had motivated the moral outcry in the first place.

This chapter investigates some similar dynamics in contemporary environmental politics. It argues that environmental politics is now dominated by a discourse that might be labelled ecological modernisation. It presents an outline of this policy- or regulation-orientated programme and gives a brief account of its history. Subsequently the chapter presents three ideal-typical interpretations of what ecological modernisation is about. In the fourth section this chapter then discusses the social dynamics of ecological modernisation. Extrapolating from the developments in some countries where ecological modernisation is now put into action, it tries to ·grasp the socio-political tendencies in the environmental domain in the years to come.

What is Meant by Ecological Modernisation?

Ecological modernisation is a discourse that started to dominate environmental politics from about 1984 onwards.[1] Behind the text we can distinguish a complex social project. At its centre stands the politico-administrative response to the latest manifestation of the ecological dilemma. Global ecological threats such as ozone layer depletion and global warming are met by a regulatory approach that starts from the assumption that economic growth and the resolution of ecological problems can, in principle, be reconciled. In this sense, it constitutes a break with the past. In the 1970s environmental discourse comprised a wide spectrum of – often antagonistic – views. On one side there was a radical environmentalist tendency that thought that the 'ecological crisis' could be remedied only through radical social change. Its paradigmatic example was nuclear power. On the other side of the spectrum was a very pragmatic legal-administrative response. The 'Departments for the Environment', erected all over the Western world in the early 1970s, worked on the basis that pollution *as such* was not the problem; the real issue was to guarantee a certain environmental quality. Its paradigmatic example was the end-of-pipe solution. Where ecological damage was proven and shown to be socially unacceptable, 'pollution ceilings' were introduced and scrubbers and filters were installed as the appropriate solution. Moderate NGOs or liberal politicians would subsequently quarrel about the definition of the height of ceilings and whether 'enough' was

being done, but they shared with the state the conviction that ecological needs set clear limits to economic growth.

Ecological modernisation stands for a political project that breaks with both tendencies. On the one hand it recognises the structural character of the environmental problematic, while on the other ecological modernisation differs essentially from a radical green perspective. Radical greens or deep ecologists will argue that the 'ecological crisis' cannot be overcome unless society breaks away from industrial modernity. They might maintain that what is needed is a new 'place-bound' society with a high degree of self-sufficiency. This stands in contrast to ecological modernisation which starts from the conviction that the ecological crisis can be overcome by technical and procedural innovation. What is more, it makes the 'ecological deficiency' of industrial society into the driving force for a new round of industrial innovation. As before, society has to modernise itself out of the crisis. Remedying environmental damage is seen as a 'positive sum game': environmental damage is not an impediment for growth; quite the contrary, it is the new impetus for growth. In ecomodernist discourse environmental pollution is framed as a matter of inefficiency, and producing 'clean technologies' (clean cars, waste incinerators, new combustion processes) and 'environmentally sound' technical systems (traffic management, road pricing, cyclical product management, etc.), it is argued, will stimulate innovation in the methods of industrial production and distribution. In this sense ecological modernisation is orientated precisely towards those forces that Schumpeter once identified as producing the 'fundamental impulse that sets and keeps the capitalist engine in motion' (Schumpeter, 1961: 83).

The paradigmatic examples of ecological modernisation are Japan's response to its notorious air pollution problem in the 1970s, the 'pollution prevention pays' schemes introduced by the American company 3M, and the U-turn made by the German government after the discovery of acid rain or *Waldsterben* in the early 1980s. Ecological modernisation started to emerge in Western countries and international organisations around 1980. Around 1984 it was generally recognised as a promising policy alternative, and with the global endorsement of the Brundtland report *Our Common Future* and the general acceptance of Agenda 21 at the United Nations Conference of Environment and Development held at Rio de Janeiro in June 1992 this approach can now be said to be dominant in political debates on ecological affairs.

Making Sense of Ecological Modernisation

How should we interpret ecological modernisation? Is it just rhetoric, 'greenspeak' devoid of any relationship with the 'material' reality of ongoing pollution and ecological destruction? Here we have to differentiate. The empirical evidence of the developments in environmental

policymaking and product-innovation in Germany and Japan, the experience of the Dutch 'environmental policy planning' approach, or the emergence of Clinton's and Gore's 'win-win' strategy in environmental and conservation issues (see for example Cockburn, 1993), shows that the least we can say is that ecological modernisation has produced a real change in *thinking* about nature and society and in the *conceptualisation* of environmental problems in the circles of government and industry. This is what I call the condition of discourse structuration. One of the core ideas of ecological modernisation, 'integrating ecological concerns into the first conceptualisation of products and policies', was an abstract notion in the early 1980s but is by now a reality in many industrial practices. Especially in OECD countries, ecomodernist concepts and story lines can now be seen to act as powerful structuring principles of administration and industrial decision-making from the global down to the local levels.[2] It has produced a new ethics, since straightforward exploitation of nature (without giving thought to the ecological consequences) is, more than ever before, seen as illegitimate.

Yet one should also assess the extent to which the discourse has produced non-discursive social effects (the condition of discourse institutionalisation). Here one has to define a way to assess social change. There seems to be a consensus that in terms of classical indicators (such as energy consumption, pollution levels) one cannot come to a straightforward conclusion. There have been marked successes in some realms (say, curbing SO_2 emissions), but mostly they have been cancelled out by other developments (such as rising NO_x levels). Likewise, where energy consumption has gone down one may legitimately wonder whether these changes are the result of the new discourse or whether the 'achievements' should be attributed to some other processes (such as economic restructuring). Hence in terms of *ecological* indicators it is difficult to come to an assessment.

The question that we focus on here is the sort of *social* change that ecological modernisation has produced, a question that is neglected only too often in social-scientific research on environmental matters. Is ecological modernisation 'mercantilism with a green twist'? Has it led to a new form of 'state-managerialism'? Does ecological modernisation produce a break with previous discourses on technology and nature, or is it precisely the extension of the established technology-led social project? Or should the 'ecological question' be understood as the successor of the 'social question', and ecological modernisation as the new manifestation of progressive politics in the era of the 'risk society'?

My approach here is to first sketch three different interpretations of ecological modernisation. They are ideal-typical interpretations in the sense that one will not find them in real life in this pure form. Almost inevitably all three of them draw on certain social-scientific notions. In this respect it is important to see them merely as heuristic devices that should help us define the challenges that the social dominance of the discourse of

ecological modernisation produces. Each ideal-type has its own structuring principles, its own historical narrative, its own definition of what the problem 'really' is and its own preferred socio-political arrangements.

Ecological Modernisation as Institutional Learning

The most widespread reading of the developments in environmental discourse interprets the course of events as a process of institutional learning and societal convergence. The structuring principle of the institutional learning interpretation of ecological modernisation is that nature is 'out of control'. The historical account is framed around the sudden recognition of nature's fragility and the subsequent quasi-religious wish to 'return' to a balanced relationship with nature. Retrospectively, *Limits to Growth* here appears as the historical starting point. *Limits to Growth* first argued that we cannot endlessly exploit nature. Of course, the report was based on false premises but now we can see that the Club of Rome had a point: we should take nature seriously. Global environmental problems like global warming or the diminishing ozone layer call for decisive political interventions.

Typically, the political conflict is also seen as a learning process. 'We owe the greens something', it is argued. The dyed-in-the-wool radicals of the 1970s had a point but failed to get it through. This was partly due to the rather unqualified nature of their *Totalkritik*. The new consensus on ecological modernisation is here attributed to a process of maturation of the environmental movement: after a radical phase the issue was taken off the streets and the movement became institutionalised as so many social movements before it. With the adoption of the discourse of ecological modernisation its protagonists now speak the proper language and have been integrated in the advisory boards where they fulfil a 'tremendously important' role showing how we can design new institutional forms to come to terms with environmental problems. Likewise, the new consensus around ecological modernisation has made it possible that the arguments of individual scientists that found themselves shouting in the dark during the 1970s are now channelled into the policymaking process.

The central assumption of this paradigm is that the dominant institutions indeed *can* learn and that their learning can produce meaningful change. Following that postulate the ecological crisis comes to be seen as a primarily *conceptual* problem. Essentially, environmental degradation is seen as an 'externality' problem, and 'integration' is the conceptual solution: as economists we have too long regarded nature as a 'sink' or as a free good; as (national) politicians we have not paid enough attention to the repercussions of collective action and have failed to devise the political arrangements that could deal with 'our' global crisis. Likewise, scientists have for too long sought to understand nature in a reductionist way; what we need now is an integrated perspective. Time and again nature was defined 'outside' society, but further degradation can be prevented if we

integrate nature into our conceptual apparatus. Fortunately, the sciences provide us with the tools needed: systems theory and the science of ecology show us the way. This understanding of the ecological crisis is supported by what the institutional learning perspective sees as the 'key problems' – collective action problems like the greenhouse effect, acid rain or the diminishing ozone layer. Basically, the institutional learning perspective would define ecological modernisation as the perception of nature as a new and essential subsystem and the integration of ecological rationality as a key variable in social decision-making. The hardware can be kept but the software should be changed.

The preferred socio-political arrangements in essence follow its reading of the history of ecological modernisation and its definition of the problem. Its historical narrative illustrates the strength of pluralist social arrangements. After all, ecological modernisation is the historical product of the critical interplay of opposing social forces. The fact that the World Bank has now adopted an ecomodernist stand is the best example of the radical power of rational argument: even the big institutions will change if arguments are phrased convincingly and correspond with the scientific evidence available. The institutional learning perspective would insist that we have to consider which alterations in scale and organisation we have to make to the existing institutional arrangements to improve 'communication' and make ecological concerns an 'integral part' of their thinking. On the one hand, that implies changes on the level of the firm and the nation state (that is, the stimulation of so-called 'autopoetic' or self-organising effects – for instance mineral or energy accounting in the firm, or the 'greening' of GNP and taxes on the national level). On the other hand, the need for integration finds its political translation in an increased demand for coordination which results in a preference for 'centralisation' of decision-making. Global ecological problems have to be brought under political jurisdiction so what we need, above all, are new forms of global management. On the local level, ecological modernisation implies that the scenarios that have been devised to further the ecologisation of society have to be protected against the – inevitable – attacks from particular interest groups. Hence the possibilities for essentially selfish NIMBY (Not In My Back Yard) protests might have to be restricted.

The sciences should in this perspective search for the conceptual apparatus that can facilitate instrumental control over nature and minimise social disturbances. They should, first and foremost, devise a language that makes ecological decision-making possible. What is required is a specific set of social, economic and scientific concepts that make environmental issues calculable and facilitate rational social choice. Hence the natural sciences are called upon to determine 'critical loads' of how much (pollution) nature can take, and should devise 'optimal exploitation rates', as well as come up with ratings of ecological value to assist drawing up of development plans. Engineering sciences are called upon to devise the technological equipment necessary to achieve the necessary ecological

quality standards respecting existing social patterns. In a similar vein, the social sciences' role in solving the puzzle of ecologisation is to come up with ideas of how behavioural patterns might be changed and to help understand how 'anti-ecological' cultural patterns might be modified.

In all, in this interpretation ecological modernisation appears as a moderate social project. It assumes that the existing political institutions can internalise ecological concerns or can at least give birth to new supranational forms of management that can deal with the relevant issues. Hence it is a sign of the strength and scope of ecological modernisation that the World Bank has become the manager of the Green Fund – it assumes that national governments can rethink their sectoral policies and that the network of corporatist interest groups can be altered in such a way that it becomes sensitive to ecological matters.

Ecological Modernisation as a Technocratic Project

The interpretation of ecological modernisation as a technocratic project holds that the ecological crisis requires more than social learning by existing social organisations. Its structuring principle is that not nature but technology[3] is out of control. In this context it draws upon the dichotomies dominant–peripheral and material–symbolic. It holds that ecological modernisation is propelled by an elite of policymakers, experts and scientists that imposes its definition of problems and solutions on the debate. An empirical example is the UN Brundtland Report. It is a 'nice try' but, as the Rio Conference and its aftermath show so dramatically, it falters because it is only able to generate global support by going along with the main institutional interests of national and international elites as expressed by nation states, global managerial organisations like the World Bank or the IMF, and the various industrial interests that hide behind these actors. Hence ecological modernisation is a case of 'real problems' and 'false solutions'. The material–symbolic dichotomy surfaces in the conviction that there is a deeper reality behind all the window dressing. Behind the official 'rhetoric' of ecological modernisation one can discern the silhouette of technocracy in a new disguise that stands in the way of implementing 'real solutions' for what are very 'real problems'.

Its historical narrative starts with the emergence of the 'counterculture' in the 1960s. The environmental movement is essentially seen as an offspring of that broader wave of social criticism. Environmentalism was driven by a critique of the social institutions that produced environmental degradation. Important icons are the culture of consumerism that forces people to live according to the dictum 'I shop, therefore I am', or nuclear power that would not only create a demand for more energy consumption but would also enhance the tendency towards further centralisation of power in society. Certainly, *Limits to Growth* is also seen as a milestone, but not for the environmental movement. Yet what *Limits to Growth* was for social elites and governments, so were *Small Is Beautiful* and *Blueprint*

for Survival for the counterculture. While in *Limits* the environmentally sound alternative was largely left implicit, the latter publications showed the way towards a truly sustainable society. In this world there would be no place for the 'big government', 'big industry' or 'big science' that, incidently, dominated the Club of Rome that published *Limits to Growth*.

The technocracy critique also has a different interpretation of the significance of the environmental movement of the 1970s. The social movements of the 1970s were not ineffective 'interest groups' that shouted loud but achieved little because they did not know the nitty-gritty of lobbying and strategic action. Quite the contrary, they were embryonic examples of new alternative democratic and ecologically benign social structures and lifestyles (Cohen, 1985). In this movement one found not only 'young well-educated middle class radicals' as some analysts would have it. It also included many scientists who were disturbed by the centralist culture that penetrated the realm of scientific inquiry but who did not necessarily share the radical political agenda of some of the activists. Likewise, it attracted many housewives and farmers who again had their own motives for participating and their own understandings of what the problem 'really' was (see the by now classic article by Offe (1985)). Many a social critic looked upon the environmental movements as one of the forerunners of a new non-technocratic society. Yet rather than learn from these movements 'the state' repressed the alternative movement, either by brute force on the squares of the cities and near nuclear power plants or by 'repressive tolerance', inviting the movements to participate in its judicial inquiries where their political message was inevitably lost in the strait-jackets of legalism (see for example Wynne, 1982). Consequently, in this perspective the emergence of ecological modernisation is not seen as product of the 'maturation' of the social movements. Ecological modernisation is much more the repressive answer to radical environmental discourse than its product. Now the ecological issue has been 'taken up by the apparatuses of power, it becomes a pretext and a means for tightening their grip on daily life and the social environment' (Gorz, 1993: 57). In this context it is not seen as a coincidence that nuclear power is conspicuously absent in the main text of the Brundtland Report. The debate has shifted from this politically explosive issue to global ecological issues that after all suggest that 'our common future' is at stake, thus obliterating old dichotomies and social alternatives.

In this perspective the ecological crisis is basically depicted as an *institutional* problem. The technocracy critique fiercely challenges the assumption that the dominant institutions can learn. How can it be that we try to resolve the ecological crisis drawing on precisely those institutional principles that brought the mess about in the first place: efficiency, technological innovation, techno-scientific management, procedural integration and coordinated management? Who believes that growth can solve the problems caused by growth? Incidently, which institutional learning processes followed the Green Revolution? Is sustainable development not

the next 'top-down' model destined to bring evil while in name it intends to do good?

This interpretation would also point at the 'structural' aspects of the problem that are left unaddressed in the discourse of ecological modernis-ation. What ecological modernisation fails to address are those immanent features of capitalism that make waste, instability and insecurity inherent aspects of capitalist development. Surely ecological modernisation will not end the 'leapfrog' movement of capitalist innovation whereby production equipments, generations of workers or geographical areas are 'written off' periodically? In this perspective the fact that the World Bank is now in charge of the Green Fund is not seen as a sign of strength of the 'ecological turn' but precisely as evidence of the fact that ecological modernisation is really about the further advancement of technocracy. Clearly, eco-software will not save the planet if capitalist expansionism remains the name of the game.

This interpretation opens the black box of society and argues that the emergence of ecological modernisation was to be seen in the context of the increasing domination of humanity by technology, where technology refers not merely to technical 'artefacts' or machines but to social techniques as well. Consequently, the *real* problem at issue is how to stop the 'growth machine'. Only then can one set about trying to remedy the very real environmental problems.

The technocracy critique argues that the sciences have in fact to a large degree been incorporated in this technocratic project. The institutional history of the discipline of systems ecology is used as a case in point (see Kwa, 1987). As historians of science have shown, it was a paradigm on its way out that during the 1960s suddenly got new institutional momentum as NASA engineers and politicians showed an interest in the science that could be integrated in the context of a wider cybernetic perspective. Likewise, the consequence of the prevailing institutional framework is that engineers develop only those technologies that enhance control over nature and society rather than achieve ecological effects while making society more humane. The social sciences are similarly implicated and are called upon as 'social engineers' who only work to help achieve precon-ceived policy goals. Alternatively, new institutional arrangements in academia and 'science for policy' should be developed. 'Counterexperts' should be able to illuminate the 'technocratic bias' in the official scientific reports. Likewise, more attention, credit and space should be given to those engineers who have been working on 'soft energy paths' that would show the viability of decentralised alternatives. Finally, the social sciences should not work on puzzle-solving activities like changing individual consumer patterns but on the analysis of the immanent forces that keep the juggernaut running towards the apocalypse, so that it might be possible to steer it, or preferably to stop and dismantle it.

The preferred socio-political arrangements of this technocracy critique are those that can correct the prevailing bias towards hierarchisation and

centralisation. Its initiatives to further a more democratic social choice centre on 'civil society' rather than on the state. Social movements and local initiatives need protection and attention. New political institutions that would facilitate this correction are the introduction of 'right-to-know' schemes (in Europe), the widespread use of referendums, and, above all, the decentralisation of decision-making and the right to self-determination. Here the differences with the institutional learning perspective come out clearly. The fight to circumvent local NIMBY protests through centralis- ation and 'increased procedural efficiency', indeed the mere construction of complaints as 'NIMBY' protests, are now seen as illustrations of the tendency to take away democratic rights under the veil of environmental care. Here NIMBY protests are recognised as a building stone for an anti- technocratic coalition. After all, protests that are initially motivated by self-interest often lead to a increased awareness of the ecological problem- atique. Hence NIMBYs may become NIABYs (Not In Anybody's Back Yard) (see Schwarz and Thompson, 1990).

In all, ecological modernisation as a technocratic project is a critical interpretation that extends Habermas's argument of modernisation as the 'colonisation of the lifeworld' to include Galtung's concern over the colonisation of the future. With the demise of the radical environmental movement its hope is set on the 'triggering effect' of a few ecological disasters.

Ecological Modernisation as Cultural Politics

The interpretation of ecological modernisation as cultural politics takes the contextualisation of the practices of ecological modernisation one step further. Here one is reminded of Mary Douglas's classic definition of pollution as 'matter out of place'. Her point was that debates on pollution are essentially to be understood as debates on the preferred social order. In the definition of certain aspects of reality as pollution, in defining 'nature', or in defining certain installations as solutions, one seeks to either maintain or change the social order. So the cultural politics perspective asks why certain aspects of reality are now singled out as 'our common problems' and wonders what sort of society is being created in the name of protecting 'nature'.

Ecological modernisation here appears as a set of claims about what the problem 'really' is. The cultural politics approach argues that some of the main political issues are hidden in these discursive constructs and it seeks to illuminate the feeble basis on which the choice for one particular scenario of development is presently made. The structuring principle in this third interpretation is that there is no coherent ecological crisis, but only story lines problematising various aspects of a changing physical and social reality. Ecological modernisation is understood as the routinisation of a new set of story lines (images, causal understandings, priorities, etc.) that provides the cognitive maps and incentives for social action. In so doing ecological modernisation 'freezes' or excludes some aspects of reality

while manipulating others. Of course, reductions are inevitable for any effort to create meaningful political action in a complex society. The point is that one should be aware that this coherence is necessarily an artificial one and that the creation of discursive realities are in fact moments at which cultural politics is being made. Whether or not the actors *themselves* are aware of this is not the point. Implicitly, metaphors, categorisations, or definition of solutions always structure reality, making certain framings of reality seem plausible and closing off certain possible future scenarios while making other scenarios 'thinkable'.

To be sure, in this third interpretation there is no implicit assumption of a grand cultural design. Quite the contrary, environmental discourse is made up of 'historically constituted sets of claims' (John Forester) uttered by a variety of actors. Yet in interaction these claims 'somehow' produce new social orders. Foucault speaks in this respect of the 'polymorphous interweaving of correlations'. The analytical aim of this approach is, firstly, to reconstruct the social construction of the reductions, exclusions and choices. Secondly, it tries to come to a historical and cultural understand- ing of these dispositions. Hence it tries to reconstruct the social forces behind ecomodernist discourse, for instance by studying discourse- coalitions. Subsequently, this approach tries to facilitate the discussion on the various probabilities, possibilities and, above all, on the various alternative scenarios for development that could be constructed.

The historical narrative of this third perspective takes up the themes touched upon at the beginning of this chapter. It emphasises that the ecological problem is not new. It observes that the ecological dilemma of industrial society is almost constantly under discussion, be it through different emblems. What these discussions are about, it argues, are in fact the social relationships between nature, society and technology. For that reason this perspective calls attention to the 'secondary discursive reality' of environmental politics: there is a layer of mediating principles that determines our understanding of ecological problems and implicitly directs our discussion on social change. Hence it would investigate what image of nature, technology and society can be recognised in the 'story lines' that dominated environmental discourse at the time of *Limits to Growth*, or during the confrontation between the state and radical social movements in the 1970s, or in the consensual story lines that dominate ecological modernisation in the 1990s. What is the cultural meaning of the biospheric orientation that is central to present-day environmental discourse? In this respect it argues that ecological modernisation is based on objectivist, physicalist and realist assumptions, all of which are highly arbitrary. Story lines on global warming, biodiversity or the ozone layer suggest the presence of the threat of biological extinction and assert that these problems should be taken as the absolute basis for an ecological modern- isation of society. But do these story lines really have the same meaning and implications for all regions? Are they as relevant for the farmers of the Himalaya as for the sunbathers of the coasts of Australia? Should we not

understand the global environmental story lines as the product of 'global-ised local definitions', as intellectuals from the South have suggested, since the problems have mainly been caused by the North while the solutions apparently have to come mainly from the South (Shiva, 1993)?

Rather than suggesting that there is an unequivocal (set of) ecological problem(s) the third interpretation would argue that there are only implicit future scenarios. The point here is not to doubt whether environmental change occurs. Neither would this social constructivism lead to a position in which each account is equally true or plausible. The point is primarily anti-objectivist and criticises the uncritical acceptance of certain scientific constructs as the starting point of politics. Bird (1987: 256) summarised this position most succinctly, writing that

> scientific paradigms are socio-historical constructs – not given by the character of nature, but created out of social experience, cultural values, and political-economic structures. . . . the actual objects of inquiry, the formulation of questions and definitions, and the mythic structures of scientific theories are social constructs. Every aspect of scientific theory and practice expresses socio-political interests, cultural themes and metaphors, personal interactions, and professional negotiations for the power to name the world.

Here it departs from the more traditional understandings of social action that are implicit in the previous two interpretations. To suggest that the developments in environmental discourse between the publication of *Limits* in 1972 and Rio in 1992 should be interpreted as a process of social learning does not appreciate the cultural bias of the process nor the contingency of the present definitions. But the technocracy critique has omissions too: its proponents might also reject the naive notion of social learning, but their differentiation between the material and the symbolic indicates that they too work with a naturalist understanding of what the problems 'really' are.

Whereas the previous two interpretations in fact shared a clear idea of the ecological problem, and both had their own idea about a possible remedial strategy (respectively conceptual or institutional change, and more coordination or more decentralisation), the third interpretation holds that there can be no recourse to an 'objective' truth. It suggests that the ecological crisis is first and foremost a discursive reality which is the outcome of intricate social processes. It is aware of the ambivalences of environmental discourse and would, in the first instance, not try to get 'behind' the metaphors of ecological discourse. It would try to encircle them to be able to challenge them scientifically, and to enhance conscious-ness of the contingency of knowledge about ecological matters. What is more, it would investigate the cultural consequences of prevailing story lines and would seek to find out which social forces propel this ecomodern-ist discourse-coalition. Once the implicit future scenarios have been exposed, they might lead to a more reflective attitude towards certain environmental constructs and perhaps even to the formulation of alterna-tive scenarios, the socio-political consequences of which would present a

more attractive, more fair, or more responsible package. Hence the central concern of this third interpretation is with *cognitive reflectivity, argumen-tation* and *negotiated social choice*.

The role of academia follows from this commitment to choice and open debate. They have to help to open the black boxes of society, technology and nature. The cultural politics perspective would resist the suggestion that nature can be understood and managed by framing it in a new 'ecological' language, as for instance by giving priority to economics and systems ecology, on the basis that a pure language does not exist. Its aim would rather be to pit different languages and knowledges (for example expert knowledge versus lay knowledge) against one another to get to a higher understanding of what ecological problems could be about. Here it would assume that this interplay would lead to the recognition of the wide diversity of perspectives.

A more radical consequence of the cultural politics perspective for science would be that the ecological crisis would, potentially, be put upside down: the debate would no longer be on the protection of nature but would focus on the choice of what sort of nature and society we want. After all, once the deconstruction of, say, the biospheric discourse has exposed its naturalist and realist assumptions, the debate might take a different turn. If people have become aware of the political and economic motivations behind biospheric discourse,[4] and have come to grips with the backgrounds of their own naturalism,[5] they might become intrigued by the 'myriad ways in which we make, unmake, and remake "nature" and "human nature" ' (Bennett, 1993: 256). If technology is no longer seen as inherently problematic but also as a potential force to reconstitute the social relationships between nature, technology and society according to one's own needs and preferences, the debate might lose its simplistic modern/anti-modern format and a debate on the re-creation of society might result. The consequence would, of course, be that the debate would no longer necessarily focus on environmental matters: the re-creation of society might often focus more explicitly on the conceptualisation of technologies, on the conditions of application of certain techniques, and on the preferred 'socialisation of nature' (rather than the mere protection of nature as it is – see the next section).

The preferred socio-political arrangements of this third interpretation follow from this analysis and focus on facilitating the discussion of implicit future scenarios. It should be emphasised that in terms of concrete ideas of how this might be organised this perspective is still searching. The most conventional suggestions follow the tracks of the republican tradition, emphasising the need for explicit choice, defence and argument, for the (re)legitimation and/or rejection of certain interventions. Like the technocracy critics it would like to bring society back in. Here we should locate the idea of a 'Societal Inquiry' which would give citizens the right of initiative – for example to re-examine the policy towards acid rain that failed to bring about results.[6] The suggestion is that this initiative would be

qualitatively different from the new democratic forms that were introduced as part of the technocracy critique. A societal inquiry does not assume a clearly defined subject matter: the point of the exercise is precisely to explore and expose the contradictions, the reductions and exclusions and to bring into the discussion the implicit understandings of technology, nature and society as well as the implicit future scenarios. Subsequently the societal inquiry would try to create the basis for focused rhetorics, for defence and argument, for relegitimation and/or rejection, and for the reorientation of political action in the light of social debate. This would also hold true for the procedures of 'symbolic law'. The idea here is that the law should no longer be seen as a conclusive statement of dos and don'ts. It would rather have to be a set of normative arguments the meaning and consequences of which should constantly be rethought in the context of concrete cases. The role of government would thus be one of defending the operationalisation it has given to the normative commitments that were the outcomes of societal debates (although one may wonder whether these suggestions are not again based on a traditional understanding of politics).

A more radical version of the cultural politics perspective would break with the traditional understanding of politics as a centralised process. It would take the very process of the creation of discursive realities as its object. Rather than seek to develop arrangements that allow to 'get behind' the metaphors it would explore how new perspectives on society can be created. The issue would not be to 'free' the natural human identity that now suffocates under the hegemony of technological applications; its aim would rather be to explore the unintended potentials of new technologies to create new identities and facilitate the awareness of affinities between various distinct identities.[7]

In all, ecological modernisation as cultural politics starts off by opening up the three black boxes of society, technology and nature and seeks to illuminate the principal openness of ecological discourse. Indeed, it would go so far as to inquire what the meaning could be of the present *ecologisation* of the risks of modernisation.

The Social Dynamics of Ecological Modernisation

In sociological theory the ecological crisis is interpreted as the confrontation of industrial society with its own latent side-effects. Zygmunt Bauman speaks about post-modernity as 'modernity coming of age'. We are, says Bauman, now able to see modernity as a 'project'. We have acquired the ability to reflect on what brought us the unprecedented wealth and we now see the (ecological) risks and dangers that we have created in the process of modernisation (see Bauman, 1991). The theory of reflexive modernisation as proposed by Ulrich Beck suggests that it is the unintentional self-dissolution or self-endangerment which he calls 'reflexivity'

which has produced the ecological crisis. Reflexivity here relates to modernity as a social formation that constantly and immanently *undercuts* itself (see Beck et al., 1994; Beck, this volume). He distinguishes this 'reflexivity' from 'reflection', which relates to the knowledge we may have of the social processes taking place. Beck holds that as the modernisation of society unfolds, agents increasingly acquire the ability to reflect on the social conditions of their existence. Yet whether or not the self-endangerment of society leads to reflection remains an empirical question.

The question is of course to what extent this reflection can be shown to be present in the present discourse on ecological modernisation. Furthermore, we should assess what forms of reflexivity we can discern in the project of ecological modernisation. Which processes of deinstitutionalisation and reinstitutionalisation take place in the context of the process of ecological modernisation? Which social projects are furthered under the flag of environmental protection? Actors might now broadly share the concepts and terms of ecological modernisation but which implicit future scenarios can we discern?

It is instructive in this respect to have a look at the regulatory efforts of some of the countries that are internationally seen as the most advanced examples of ecological modernisation, such as Germany, or The Netherlands with its comprehensive policy planning approach.[8] In these Western European countries we now see a broad societal coalition working on the institutionalisation of ecomodernist ideas. By and large this institutionalisation is based on the premises of the institutional learning interpretation of ecological modernisation that was sketched above. Yet the social dynamics of ecological modernisation come out to be not as predictable as that ideal-type might suggest. We can in fact observe at least four distinct lines of development.

There can be no doubt about the fact that the main *direct* effect of ecological modernisation is the *rationalisation of ecology*, through the conceptual and institutional amendment of existing bureaucratic structures and the creation of new ones, be it by the state or by new ecocorporatist associations. There seem to be good grounds to argue that there are certain parallels between the history of the US conservation movement in the Progressive Era and the development of the discourse-coalition of ecological modernisation. What started in the late 1960s and early 1970s as a concern about the lack of care for nature seems, over the years, to have given way to a coalition of forces that produces social effects that are at odds with the original intentions of the environmental movement. This tendency towards rationalisation is well known and is in fact implicitly described in the discussion in the previous section, while its dynamics have been analysed elsewhere (Fischer, 1990; Paehlke and Torgerson, 1990; Hajer, 1995).

One should observe, however, that the attempt to rationalise ecological issues according to the prescriptions of the institutional learning paradigm

does *not necessarily* produce a rationalisation of ecology. It may also produce a critical form of cultural politics. Take for instance the effects of the national political commitment to sustainable development on policy-makers at the local level. They are confronted with the need to translate 'sustainable development' into new planning procedures, conservation strategies, etc. By directive they are ordered to make sustainable develop-ment their new 'cognitive map'. Yet here they are confronted with all sorts of interpretative difficulties. After all, sustainable development is merely a 'story line' that generated its global support precisely because of its ambivalence. So what happens in actual practice? Policymakers are left to themselves when it comes to the operationalisation of the notion of sustainable development. Here they have a great freedom. They can either make a few aesthetic alterations but basically continue with business as usual, or they can use sustainable development as a crowbar to break with previous commitments. In that case institutional learning produces cultural politics and opens the possibility for a more broadly defined reflection on the sort of problem the ecological crisis 'really' is.

Another interesting development in this respect are the quarrels that are beginning to erupt over the first ecomodernist practices, most notably the waste recycling programme. Whereas waste-reduction programmes have so far not proved to be successful, waste-recycling schemes are threatened precisely because of their success. This causes similar difficulties in Germany, The Netherlands and Austria. The unexpected quantity of materials (glass, plastics, metals) that consumers manage to bring together for recycling now exceeds the capacity of the recycling facilities. On the one hand this causes a renewed resistance of industrial firms to the waste-recycling schemes. On the other hand it is a case where the pragmatic solutions themselves produce the evidence that waste might require more fundamental changes, thus – potentially – enhancing the reflection on the meaning and consequence of the 'ecological crisis'.

A second tendency we can discern is the *technicisation of ecology*. Perhaps the most significant development is taking place behind the scenes in the leading ecomodernist countries – the striking but little discussed reorientation that has taken place in the strategic planning of big multi-national firms such as Siemens, DASA and BMW. They are central in the ecomodernist discourse-coalition. They strive towards a set of clearly defined ecoindustrial innovations, they have a new idea of what the relevant actors are, and they carefully work towards a set of new institutional arrangements. They too can be seen using the threats of potential ecological disaster or climate catastrophes as a crowbar, but this time it is used to fulfil the promise of 'intelligent' traffic systems, 'smart' highways, 'intelligent' energy savings technologies, renewable energies, and socially engineered behavioural changes. NGOs like Greenpeace, trade unions and politicians can, albeit for varying reasons, all be seen to help push ecological modernisation in this direction. Similar developments are well under way in the United States, where the 'Big Three' car

producers work together with firms like IBM, AT&T and the Federal government on multi-billion dollar plans to create this new 'intelligent' transport system. What this in fact amounts to is the amendment and extension of existing large technical systems, a tendency which will prove to be extremely powerful.

From the perspective of the technocracy critique the danger of this technicisation of ecology is that ecological modernisation short-circuits a superficial understanding of some emblematic ecological problems with a new technological commitment. Essentially, microelectronic technologies are presented as the solution for the 'juggernaut effect'. The cultural politics perspective observes that the discussion on alternative future scenarios is thus strangled in a double way: both the debates on informa-tion technology and on the ecological crisis are shifted aside to make way for 'efficient' and 'positive sum game' solutions.

Other examples of this tendency towards the technicisation of ecology are not difficult to find. Compared to the 1970s the ecomodernist policy-discourse has also caused a huge shift in the conceptualisation of environ-mental problems by the NGOs. The shift in thinking about strategic solutions is of such an extent that an NGO like Greenpeace that once started off opposing nuclear tests, and is well known for its protection of endangered species, could recently announce its backing of the develop-ment of a 'green car' as well as its own plan to construct a tunnel under the Öresund, creating a rail link between Sweden and Denmark. The idea behind this latter initiative is to provide a readily available solution as an alternative to the longstanding plans of the Danish and Swedish govern-ments to build a bridge for car traffic. Similarly, efforts are now being made in Japan to apply the latest freezing techniques to conserve species that are threatened with extinction, and, as a final example, German social scientists have found that in the debate on biotechnology ecology is now used as a justification for continued development in this area. Unlike in the early days, when biotechnology was still proposed as the 'Eighth day of the Creation', it is now constructed as an 'ecologically benign' technology because it would require radically less resources (see Lau et al., 1993).

This technicisation of ecology receives its social strength of course not primarily from its beneficial effects in terms of ecological improvements. The technicisation of ecology is the translation of a social and moral issue into a market issue. It is based on the conviction that ecology is, potentially, a new – and huge – market which is to be created and, subsequently, to be conquered. Traditionally, sociologists would perhaps argue that this tendency is based on a great faith in the capacity to control side-effects in advance. Yet it is questionable whether that belief really was constitutive of this tendency in the first place.

A third line of development that ecological modernisation has produced is the tendency towards the *ecologisation of the social*. This tendency is not so much part of ecological modernisation as a response to it. Ecological modernisation is a strategy that believes in further rationalisation, and in

creating and maintaining the society-wide coalitions to 'fight' environmental degradation. Despite all the critique that one might advance of the Brundtland process, the fact remains that this was conceived as an essentially social-democratic and Western European project. Brundtland was in fact the third Western European social-democratic leader to head a UN commission on global integration (after the Brandt Commission on development and the Palme Commission on disarmament) (Ekins, 1992: chapter 2). The principle of international solidarity, and the social-democratic belief in modernist productionist solutions, therefore always figured prominently.

Inherent in the positive sum game format is the commitment to conceptualise solutions within the existing social system. That means going along with the further integration of world markets, and trying to *add* the social or, more recently, the ecological dimension. Hence *add* a 'social chapter' to the Maastricht Treaty, *add* an ecological paragraph to GATT, *add* the Green Fund to the World Bank. The contradictions that are inherent in this integrative thinking now clearly also produce their reactive counterparts. And here the alliance with the 'big institutions' and existing discourses of power backfires.

Here I would point to the important role of the ecological issue in what various others have called the new regionalism, the new localism, the new tribalism or the 'politics of place'. Those concerned about environmental degradation can rejoice in great interest from the circles of the German new right, which is pasting together a 'place'-orientated ideology. Here the economic and political uncertainties are interpreted as being the product of globalism. This is then subsequently used to recreate a new national sense of order based on a renewed appreciation of 'place' versus 'space'.

In this discourse the national environment becomes the basis for a new national identity, and care for the environment is put forward as an argument to try to regain an allegedly natural social ecology:

> Ecology opens our eyes and shows that nations are not simply human complexes, based on shared language, attitudes, culture and history. Their evolution and their inexchangable identity is also to be understood as the product of the soil from which these complexes grew, the space in which that happened and with which they are connected.[9]

Environmental problems are here seen as the product of a global political project in which a diffuse array of various 'insensitive' actors including the EC bureaucracy, multinational industries and democratic politicians participate. In this context the 'problem' of asylum seekers is drawn into the ecological debate. On the one hand they do not share concern for the regional environment (they do not 'feel' it); on the other hand it is argued that they are extra mouths to feed and people to house, which will require an increase in industrial production and hence cause more environmental destruction (see Jahn and Wehling, 1991, 1993). As Jahn and Wehling have shown for Germany, this new ecologisation of the social should not be seen as a clearly defined ideology that is confined to the new right. It is

much more an 'argumentative formula' that can be found much more widely (see also Eder, this volume). Indeed, it is a formula that can be found in mainstream politics in other countries too.

The fourth line of development is the *socialisation of ecology*. Here the debate on the ecological crisis is simply recognised as being one of the few remaining places where modernity can still be reflected upon. It is in the context of environmental problems that we can discuss the new problems concerning social justice, democracy, responsibility, the preferred relation of man and nature, the role of technology in society, or indeed, what it means to be human. This gives ecological discourse a great political importance. In a way it is completely irrelevant whether emblematic problems like global warming constitute the dangers that some people argue they present. Global warming should simply be seen as one of the few possible issues in the context of which one can now legitimately raise the issue of a 'No' to further growth. Here the philosophical imperative of responsibility can be introduced in centre-stage political decision-making through a plea for a 'No regrets' scenario on global warming targets for low energy consumption.

At the same time, the socialisation of ecology perspective would hold that the 'ecological crisis' is by no means unique. Here it elaborates on the cultural politics perspective. Indeed, there is much to be said for the integration of the debates on new technologies that are generally kept separate. If one would break with the conception that nature should be understood as something 'out there', and with the idea that nature stands for the 'authentic', the pure and the good, one might create the possibility of a more vibrant sort of debate. If technology is no longer simply seen as what threatens 'nature' (and hence society) but is also seen as something which creates, at least potentially, new opportunities and new social arrangements, one might be willing to go along and take one more step and discuss the introduction of *in vitro* fertilisation, experiments on embryos or man–animal transplants as essentially ecological issues. This socialisation perspective reflects on 'nature in the age of its technical reproducibility' as the eloquent German philosopher Gernot Böhme (1992) has put it. Rather than mourn over the end of nature we might start to think about what kind of nature we really want. The struggle to protect nature 'as it is' often brings barbed wire into the prairie while the ever more frequent attempts to bring back 'nature as it was' lead to the most bizarre engineering exercises. So rather than leave modernist commitments as they are, it seeks to save Enlightenment thought from the attempts to interpret the ecological crisis as the basis for a further centralisation of power (as in the prevailing global discourses) and from the attempts to use the ecological crisis as the basis for a new intolerant regionalism.

This challenges the boundaries of what is normally understood to be the subject-matter of ecological discourse. That is precisely the point. Ecology would here become the keyword under which society discusses the issues of 'life politics' (Giddens) in a way that allows for a rethinking of existing

social arrangements. The rhetorical strength of the ecological crisis would be used to reflect on the nature of modernity.

Conclusion

It will be clear that the four lines of the development sketched above are by no means equal in strength. The rationalisation and technicisation of ecology are well under way while the popular critique drifts more and more in the direction of the ecologisation of the social. The issue really seems to be how to improve the strength of the fourth perspective. Yet how would one increase the reflective awareness of the possibilities of ecological modernisation? How would we arrive at a position where reflection means more than awareness of the 'ecological crisis' alone? How would we get it to include awareness of the necessary openness of the definition of problems and solutions and, finally, how would we achieve an increased awareness of the fact that ecological modernisation should be based on a debate on the recreation of the relationships between nature, technology and society?

It should be said at the outset that there can be no naive idea about the possibilities of bringing about this discussion on 'the nature we really want'. The sociology of technology literature has given us ample evidence of how large technical systems have their own logic of development. Nevertheless, the critical task now is to devise the discursive stages where these patterns can be discussed and democratically renegotiated. In the context of the prevailing tendencies towards a rationalisation and technicisation of ecology, and in an awareness of the dangers of a ecologisation of the social, one should seriously reflect on the need to reinvent democracy. As Bauman (1991: 276) writes:

> What is left outside the confines of rational discourse is the very issue that stands a chance of making the discourse rational and perhaps even practically effective: the *political* issue of democratic control over technology and expertise, their purposes and their desirable limits – the issue of politics as self-management and collectively made choices.

Exploring the ambivalences of ecological modernisation and trying to come to institutional forms that could accommodate the increase of cognitive reflectivity, argumentation and negotiated social choice seems one of the key issues that could reconstitute the basis and meaning of environmental politics.

Notes

1. For a more elaborate analysis of ecological modernisation, see von Prittwitz, 1993; Hajer 1995.

2. This interpretation is now more widely supported. See for example Weale, 1992; Spaargaren and Mol, 1992; von Prittwitz, 1993; Harvey, 1993; Liefferink et al., 1993; Healey and Shaw, 1993; Teubner, 1994.

3. Whereby technology is conceptualised in the Schelskyan sense of the term – that is, including both technology as artefacts and 'social technologies'. See Schelsky, 1965.

4. See the various contributions in Sachs, 1992, and Sachs, 1993.

5. For this aspect compare the discussions in Harvey, 1993, and in Beck, 1995.

6. For an elaborate discussion of these ideas and others, see Hajer, 1995: chapter 6; also Zillessen et al., 1993.

7. The best examples of this can be found in Haraway, 1991; and Bennett and Chaloupka, 1993.

8. For a discussion of the development in environmental policy in these countries, see Weale, 1992.

9. Professor W.G. Haverbeck, quoted in Maegerle, 1993: 6.

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