

Science, Culture and the Environment - Phase 2

ESRC End of Award Report

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Summary of Research Results

1. SUMMARY OF RESEARCH RESULTS

This research programme has involved four free-standing, but inter-linked, studies of issues of contemporary environmental significance, and an over-arching project aimed at drawing out more general conclusions from the whole. The specific domains addressed were titled:

- A. Models and Environmental Policy Development;
- B. Data Bases and European Environmental Policy;
- C. Environmental Valuation - Methods and Negotiation Frameworks;
- D. Environmental Ethics and Sustainable development: A Relational Approach and
- E. Environmental Risk, Knowledge, and Uncertainty.

Studies A-D each had a research fellow, working in collaboration with one of the two principals (BW, RGW). Each study had an empirical focus, in a 'live' environmental policy domain, and used qualitative research methods (interviews, focus groups, ethnographic interaction, and in some cases participant observation). Study E provided a reflective space for the whole.

The overall objective was two-fold: to develop an increasingly fine-grained, but integrated, understanding of the dynamics and cultural 'architecture' of tensions and conflicts in the field of 'environmental' issues, with a view to enriching academic and policy world understanding of their dynamics in contemporary circumstances; and to foster the emergence of new patterns of relationship between academic social research and the knowledge needs of wider society, as encountered through environment and risk issues.

The programme's linked group of studies has constituted the second three-year phase (Phase 2) of the six-year ESRC GEC-funded 'Science, Culture and the Environment' programme at the Centre for the Study of Environmental Change (CSEC). Through the programme, CSEC has been developing a distinctive *sociology of knowledge*-based approach to issues now seen as of growing political and social significance in the UK and similar countries, including sustainable development/Agenda 21, the handling of *uncertainty* and *ignorance* in 'political' risk conflicts (e.g. Brent Spar, BSE, regulation of Genetically Modified plants and foods), public ambivalence towards scientific expertise, and new patterns of public engagement in 'deliberative' democracy in 'late modern' societies. The Phase 2 studies cross-fertilised, singly and collectively, with a range of other parallel CSEC projects, involving cross-disciplinary, and in a number of cases international or cross-cultural research collaborations, with philosophers, anthropologists, economists, political scientists, environmental modellers, and biologists, as well as continuing interactions with bodies as varied as the European Environment Agency, the Forestry Commission, the Department of Health, Greenpeace, World-Wide Fund for Nature, Lancashire County Council, Unilever, and English Nature.

Each one of the studies is argued to have made significant advances in the qualitative understanding of 'knowledge' issues and the dynamics of 'lay'-'expert' tensions in the respective specialist domain considered - including Climate and Integrated Assessment Modelling; European Environmental Classification and Data Base Development; Valuation Techniques in Environmental Economics; Cultural Dimensions

of 'Sustainable Development'; and Risk Assessment and Uncertainty. But integral to the programme overall have also been processes of continuing *shared* reflection on, and exploration of, issues of generic significance emerging from the individual studies. These have included: the under-acknowledged heuristic social character of apparently 'technical' tools such as formalised models or economic valuation techniques; the *mutual construction* of scientific knowledge and political order in particular institutional spheres; and the implications of procrustean representations of human moral and ethical experience in official regulatory frameworks. Promising progress has been made - through personal interactions with bodies such as the Royal Commission on Environmental Pollution, the Department of Health, the Health and Safety Executive, and, most recently, the Environment Agency - in elaborating the potential practical *policy* benefits of enhanced understanding of such matters, and their implications for institutional change. With colleagues from other universities, progress has also been made towards the possible integration of qualitative and quantitative methodological approaches to such matters.

The principals have been encountering growing recognition within a number of government departments and agencies, corporate bodies, and NGOs, of the relevance of the 'culturalist' analytical perspective developed within the programme, for the challenges they are facing, at a time of considerable social, political and cultural turbulence. This has led to an increasing number of associated 'applied' studies sponsored by bodies as different as English Nature, Greenpeace, Unilever, Going for Green, ESRC, and Business Partnership for the North West, on issues seen as of urgent concern to them.

A large number of publications - journal articles, books and book chapters, invited conference papers, etc - have already appeared, and two books, integrating the findings as a whole, are now planned. Reflecting the work on the two Phases of the programme since 1991, the principals and their colleagues attracted a 5* grading in the 1996 Research Assessment Exercise.

A new MA, 'Environment, Culture, and Society', based on the programme, will be launched in October 1998, and further CSEC post-graduate programmes are now being planned.

Full Report of Research Activities and Results

2. FULL REPORT OF RESEARCH ACTIVITIES AND RESULTS

Context and Background

'Science, Culture and the Environment: Phase 2' is the second (1994-1997) half of a six-year research programme led by the principal grant-holders (RGW and BW). Some introductory comments on its provenance may be useful for a full evaluation of any achievements claimed below.

The principals' initial 'Science, Culture and the Environment' programme proposal crystallised in 1989-90 out of a developing intellectual chemistry between BW and RGW, whose different, but nevertheless highly complementary, experiences over a number of years in respectively the academic research and national environmental policy worlds had led to a shared sense of the significance of *environment* and *risk* issues in contemporary culture - and subsequently to an urgent shared concern to begin exploring the character and implications of possible inadequacies in the structures of 'knowledge', natural and social scientific, commanding dominant intellectual authority in the associated policy and research domains. This led them to propose, in 1990, the initial multi-pronged 'Science, Culture and the Environment' programme, which was successful in attracting an initial three-year (1991-1994) grant of £518k from ESRC's then-new Global Environmental Change (GEC) programme.

By the end of this first three years, the work flowing from 'Science, Culture and the Environment: Phase 1' appeared to have confirmed the promise of the principals' intuitions about the field. After due consideration, ESRC's independent anonymous reviewers evaluated the outputs, apparently unanimously, as 'Outstanding'; and the principals and their key associates attracted a 5* grading, as key contributors to Lancaster's 1996 RAE Sociology unit, directly on the strength of the work (a summary of which is attached as Annex B). Equally significantly, the programme had come to constitute an indispensable initial 'spine' for the rapid emergence of the Centre for the Study of Environmental Change (with RGW and BW as respectively Director and Research Director), as a fresh institutional presence on the European environmental research scene. A proliferating range of cross-disciplinary collaborations were generated, involving colleagues within Lancaster and other UK universities, as well as in continental Europe and North America; a range of talented younger researchers were drawn in, several of them progressively more mature and independent partners in the Centre's deepening trajectories of development; a growing number of further, and well-diversified, research grants were attracted, from UK, EU and US sources; a number of articles, reports, books and book chapters were published; and interactive research relationships with 'outside' bodies (in government, industry, NGOs, and the scientific community) began to crystallise.

From 1994 onwards, with the continuing 'spine' of the follow-up 'Phase 2' ESRC GEC programme grant (£550k over three years), these developments gained further momentum. Thus by the end of 1997, from a standing start in 1991 (two principals and a secretary), CSEC had reached a highly interactive staff of 20, and, reflecting growing academic recognition, had attracted research grants totalling cumulatively more than £2.5 million. Moreover, in ESRC's 1997 independent (and highly positive) review of the

GEC programme as a whole, *Interim Assessment of the ESRC Global Environmental Change Programme* (by Dr S. Rayner, for the ESRC's Research Evaluation Committee), CSEC's distinctive structure and modus operandi were urged as models for emulation elsewhere in the UK.

This preamble is important to an understanding of the purposes and any possible accomplishments of 'Science, Culture and the Environment: Phase 2' outlined in the present report. From the outset, since their initial (1990) proposals to ESRC, the principals have seen themselves not only as conducting social scientific research *strictu sensu*, but also as establishing foundations *through* such research for a fresh intellectual synthesis, with potential implications for evolving patterns of relationship between the academic and policy worlds, appropriate to new patterns of challenge confronting societies as they approach the 21st century. This has involved *using* the research tools and resources of the social sciences (and associated humanities) in relatively fresh and distinctive ways, as 'probes' for exploring and testing a range of hunches, theoretical insights, moral intuitions, and intellectual synergies, through the prism of a selection of on-going live issues in the 'environmental' sphere - 'given the principals' sense of the strategic significance of that sphere in current processes of social and cultural change. With each new set of interactions with peers in the academic and public worlds, the principals and their CSEC colleagues have been gaining confidence in the potential significance for many social institutions, as much as for social theory, of the approach being fostered in embryo. This has been at times a fraught process, involving major *managerial* challenges - for which, it has to be said, the principals are not especially well suited by nature - in a fast-developing context. But the trajectory has been consistently encouraging, and the indications now are that CSEC is beginning to move into a new and still more interesting phase.

It should be noted that at the time of the original 1991 ESRC GEC grant award, the perspective outlined in embryo stood in clear contrast to the then-dominant intellectual approaches in both public policy and academic worlds (including ESRC itself) towards environmental issues (which tended to be conceived of overwhelmingly as unambiguous 'objective', largely scientifically-defined problems, to be controlled or resolved through economic, regulatory, and/or technological devices). RGW/BW's intellectually eclectic, sociology of knowledge-based emphasis on the cultural and 'symbolic' dimensions of environmental issues and conflicts in 'late modern' societies, and on the material significance of tensions arising from tacit assumptions about human identity and social relationship embedded in institutionalised 'expert' knowledge(s) in the Anglo-Saxon world, sought to reach beyond this somewhat positivistic 'orthodoxy' (without rejecting it outright), with a view to enriching debate about the fuller implications for society of the environmental 'turn'. And as the 1990s have unfolded, there have been signs of progressively greater acknowledgement of the value of this 'alternative' approach - or at least of its fruits in particular circumstances - in the academic, policy, and, interestingly, industrial worlds. What is more, such processes of acknowledgement now look increasingly set to continue, albeit in continuing tension with a variety of powerful contrary contemporary cultural forces (an issue to which we return below).

From the still-emerging perspective of the principals, a crucial factor driving this burgeoning interest in their work may be precisely the fact that government and industry bodies have begun, in the late 1990s, to encounter for themselves the limitations of the

reductionist 'expert' knowledge(s) and appraisal methods on which they have been accustomed to rely. Indeed, they (RGW, BW) would contend that recent mainstream UK 'legitimation' crises around issues of risk and environment, such as those surrounding the 1995 Brent Spar oil platform (between Greenpeace & 'public' on the one hand and Shell & Government on the other), the 1996-97 'scientific' handling of the BSE-CJD issue, and since 1996 the frequently subterranean patterns of public unease towards genetically-modified foods and plants, can usefully be read in the light of precisely the analytical and epistemological limitations in mainstream environmental and risk evaluation discourses clarified in 'Phase 1' of their ESRC GEC-funded research programme (see Annex B). Indeed, observing these recent official 'risk' crises, the principals feel entitled to underline that their original (1991) Rationale to ESRC for the 'Science, Culture and the Environment' programme had laid emphasis on precisely the burgeoning structural tensions in the UK's 'expert knowledge' domain, of which these and other perturbations have arguably been contemporary expressions. (A copy of that Rationale is attached as Annex C).

This sense of a growing institutional responsiveness, driven by 'surprises' in the real world of environment and risk *events* and policies, helps explain why much of the activity at CSEC in and around 'Phase 2' of the programme has been gravitating towards consideration of potentially constructive new approaches to how the tensions in such contexts might be addressed better. The theoretical insights from 'Phase 1', concerning the epistemological 'architecture' of such matters have continued to be consolidated and tested empirically - but beyond this, building on such understandings, 'Phase 2' has seen the incremental accumulation of a body of *applied* experience within CSEC of innovative processes of 'qualitative', 'deliberative' engagement with institutions, publics, and 'expert' communities in a fashion that appears to hold promise of real and continuing benefits on the ground.

In academic terms, the resulting body of work appears now to be developing relevance for theoretical agendas across a number of disciplines: For *political science*, contributions towards the better understanding of cultural under-currents feeding the current re-emergence of 'public participation' and the invigoration of both 'local' and (more embryonically) 'global' democratic networks and issues (including experiments with new interpretative methodologies relevant to such emerging developments in democratic exchange); for *social theory*, the development, with European colleagues such as Beck, Hajer and others, of more culturally and politically elaborated theoretical treatments of processes of 'reflexive modernisation' and public mistrust in risk-managing institutions and discourses; for *political philosophy*, new empirically-derived theoretical insights into issues of 'community', 'social identity', and realisation of 'the good life', in the circumstances of sustainability and global cultural change; for *government studies*, developing understanding of the relationships between 'new public management', expert knowledge, deregulation, and new patterns of citizen and NGO interactions with government in the UK and elsewhere; for *environmental economics*, enriched understanding of the limitations of 'scientific' constructs of environmental value, and of the potential role of more deliberative approaches to value for advances in economic methodology; for *science studies* (and *social science* more generally), a thickening appreciation of the implications of the 1980s 'reflexive turn' in social science for the implicit 'construction' of human subjects through apparently 'natural' discourses; for *theology and hermeneutic philosophy*, fresh, empirically-ground speculations about

human subjectivity and 'meaning', at a particular stage in human social evolution; for *international relations* and *development studies*, contributions towards the critical assessment of dominant epistemologically realist narratives of global environmental change, and towards understanding of the processes of 'mutual construction' of institutional credibility and scientific authority vis a vis global environmental issues; and for the *climate modelling-related sciences*, fresh cross-disciplinary approaches to the handling and representation of 'uncertainty', to debates about 'complexity' in models, and to the representation of human behaviours in the new integrated assessment models.

Thus it can be argued that ESRC's funding of the two phases of the 'Science, Culture and the Environment' programme over the period 1991-1997 has been enabling the principals and their colleagues to extend and thicken the research community's overall intellectual 'map' of the environmental and risk protection domains - whilst at the same time nurturing radically promising social insights concerning these and wider political-cultural matters. In the process, it has also been fostering the emergence of an institution (CSEC) now seeking actively to advance these perspectives, through research and associated theoretical development, through the progressive development of related post-graduate teaching programmes, and through direct interactions with the worlds of industry, public policy, and general public discourse.

Progress in Phase 2

Method

The Phase 2 programme has consisted of four full-scale individual studies (A-D) and a fifth 'integrating' project (E). Thus:

- A. Models and Environmental Policy Development
 - B. Data Bases and European Environmental Policy
 - C. Environmental Valuation - Methods and Negotiation Frameworks
 - D. Environmental Ethics and Sustainable Development: A Relational Approach
- and
- E. Environmental Risk, Knowledge and Uncertainty.

Key findings from the individual studies are summarised in Annex A.

The first four of these each had its own full-time Research Fellow, responsible to and collaborating with either BW (studies A & B) or RGW (studies C & D). In each case, the Research Fellow has been able to build on, and extend, a distinctive network of intellectual and 'user' relationships, emerging from the earlier Phase 1 (1991-1994) activities.

Within the Phase 2 programme as a whole, such individual studies have played two roles. First, each has constituted an energetic node of intellectual activity in its own right - with the respective Research Fellows each becoming recognised increasingly in the corresponding academic and policy networks for that domain as creative individual contributors. The domains in question have covered a wide spectrum. For example,

Shackley (study A) is now widely published and recognised within the climate modelling communities on both sides of the Atlantic, and Waterton (B) a significant 'ethnographic' contributor in the European and US vegetation science worlds - whilst Foster (C) is a published and emerging authority in UK and EU environmental valuation debates, and Szerszynski (D) an original and increasingly respected initiator of ethical and religious analysis of contemporary environmental and cultural movements and issues.

Second, and in parallel with the above, the fine-grained experience gained within the various individual fields of study has fed continuously into the continuing conversation within CSEC on the over-arching intellectual concerns of *the programme as a whole*. Thus, to give one illustrative example, an increasingly discriminating understanding has emerged of the extent to which apparently technical 'mechanical' tools widely relied upon by official bodies at every level from the local to the global - such as formalised models (of climate or other environmental systems) (study A), probabilistic risk assessments (E), contingent valuation processes (C), and environmental data bases (B) - share a largely unacknowledged heuristic, *social* character, in that, when applied in specific real-world contexts, each embodies - indeed necessarily must embody - tacit assumptions about society and 'the human' of normative kinds, and about the appropriate framing of issues and their boundaries. This confirms that tacit social and political judgements are embedded within such technical knowledge(s) - an issue which in turn has fostered energetic reflection within CSEC on matters such as the new patterns of current tension between imperatives of executive action and those of democratic process, possible new forms of 'deliberative' mechanism which might assist constructive discussion of the values at stake in such judgements, and (both philosophically and practically) the potential 'pedagogical' implications of the concept of judgement itself in such contexts.

These and other congruences have been explored, piecemeal and collectively, and have found increasing reflection in the written outputs of individual Research Fellows in their specific fields (as well as within CSEC's developing post-graduate programmes), whilst at the same time helping catalyse and extend the personal theoretical reflections of both of the two principals (of which more below). Other cross-cutting themes emerging from the individual studies' investigations have been explored collectively in similar fashion. For instance: the iterative processes of *mutual construction* of scientific knowledge and political order as evidenced in particular institutional spheres; the definition and handling of *uncertainty* in regulatory science and evaluation, as an increasingly problematic issue for political legitimacy and trust in on-going public controversies; the dynamics of particular *epistemic discourse coalitions* in generating, sustaining, or vitiating particular policy approaches; the sources and implications of 'possessive individualist' assumptions about personal attitudes and agency, as embodied in particular technical discourses; and the procrustean representation of human moral and ethical experience in official regulatory frameworks. What this all means is that, methodologically, an important feature of the Phase 2 programme as a whole has been a continuing level of interaction and intellectual friendship between the principals and their colleagues, in both structured and unstructured forms - interactions which in turn have been evolving and consolidating a distinctive shared set of conceptual terms, tacit understandings, and research praxes.

Crucially such interactions have *also* involved other CSEC research personnel - those working on projects lying outside the formal boundaries of the ESRC-funded Phase 2 work. These various initiatives - all of them of substantial intellectual substance, and chosen deliberately to be complementary to the aspirations of the 'Science, Culture and the Environment' intellectual programme - have been of two kinds: international partnerships funded by the European Commission (DG XII), European Science Foundation, US National Science Foundation, US Department of Energy *et al* (there have been *seven* such international projects in train within CSEC during the Phase 2 period); and 'sponsored' studies, contracted by local authorities, government agencies, NGOs, and industrial bodies (for example, the Health and Safety Executive, Going for Green, Unilever, Forestry Commission, English Nature, Greenpeace, Business Partnership for the North West, and Lancashire County Council). The CSEC research colleagues working on such projects - including Peter Simmons, Phil Macnaghten, Eric Darier, Sue Weldon, Patrick Van Zwanenberg, Elham Kashefi, Elizabeth Shove, Bryan Kitchener, and Sujatha Raman -, together with close Lancaster associates such as Alan Holland & John O'Neill (Philosophy, both Honorary Research Fellows of CSEC), Greg Myers (Linguistics), John Urry & Sarah Franklin (Sociology), John Rodwell (Biological Sciences) and Peter Young (Environmental Sciences), have added not only crucial theoretical reflection and comparative trans-national perspectives to the internal interactions around the Phase 2 programme, but also a body of increasingly refined experience of intellectual negotiation with 'real world' needs and priorities.

The 'sponsored' projects - most of them exploring 'leading edge' issues of pressing concern to the bodies in question - have been especially significant, not only in acting to disseminate and 'test' in the public domain the more theoretical perspectives arising from the ESRC-funded work, but also in actively *enriching* the latter, through bringing new front-line experience and methodological insight to bear on it. (It should be added that the completed reports on such projects seem to have been received positively by their sponsors, on grounds both of insight and of strategic operational relevance). Phil Macnaghten, a CSEC Research Fellow holding a British Academy Post-Doctoral Research Fellowship over most of the Phase 2 period, has been a notably consistent contributor to the development of the work in this domain (some of it reflected in his 1998 book with John Urry, 'Contested Natures').

Complementing such activities in similar fashion have been the parallel executive and advisory involvements of the principals and certain of their colleagues in bodies such as the European Environment Agency (BW: Member (European Parliament appointee) of the Management Board), Department of Health (BW: Adviser to Chief Medical Officer); Biotechnology and Biological Sciences Research Council (BW: Member of Expert Group on Public Concerns); Forestry Commission (RGW: Statutory Commissioner); Ministry of Agriculture, Fisheries and Food (RGW: Member of NW Regional Advisory Panel); Greenpeace (RGW: UK Board Chairman and International Trustee); Green Alliance & Common Ground (RGW: Board Member); Environment Agency (S Shackley: Member of the National Centre for Risk Analysis and Options Appraisal Client Board); ESRC (Elizabeth Shove, BW and RGW: occasional invited consultants); DG XII (BW: Adviser to 4th Framework R & D Programme); and National Provident Institution Global Care Fund (RGW: Expert Advisory Group Member).

In the particular collegial ethos to have emerged at CSEC on the back of the 'Science, Culture, and the Environment' programme as an *indispensable feature of its intellectual modus operandi*, these involvements, like the 'sponsored' studies, have themselves been a consistent source of further empirical understanding of the dynamics of knowledge framing, generation, contestation and consensus-building. So too have been a range of less formalised exchanges and encounters over the study period - for example, the informal advisory relationships of CSEC personnel with the National Trust on its thinking about countryside strategy, with the Royal Commission on Environmental Pollution on its 'Environmental Standards' study (jointly with Philosophy colleagues), with the Environment Agency on its emerging 'environmental valuation' interests, with Lancashire County Council on its approach to 'deliberative' forms of interaction with the public, with the Prince of Wales on the issue of genetically modified foods, and, more personally, with the DOE (now DETR) Chief Scientist on tensions around the framing of 'scientific' and research issues. Experience with all of these has fed into, and helped calibrate, the over-arching Phase 2 conceptual analysis.

Reflections and Outputs

What substantive progress has been made in Phase 2, and how are the over-arching findings now being advanced and disseminated?

Building on the earlier ground-clearing in Phase 1 (see Annex B), there has been a steady overall thickening of the principals' understanding of the links between: institutional commitments; 'knowledge-problem' framing and definitions; the mutually reinforcing effects of dominant scientific and other 'expert' discourses and particular normative tacit understandings of political order; the associated drive towards 'objective' physical *attestability* in media-saturated democracies; the beguiling virtues (and limitations) of information technology; issues of authority, trust, and perceived legitimacy in industrial polities; under-acknowledged tensions surrounding different understandings of *the human subject* (or 'human nature') in the contemporary world; and new experimental possibilities, going potentially with the grain of current political developments, for enriching public discussion of relevant 'value' issues lying currently outside conventional frameworks of debate. BW and RGW are increasingly confident of the robustness of their now-crystallising integrated frameworks for such insights from the 'Science, Culture and the Environment' programme. Indeed they judge that, when articulated in accessible and integrated form, the latter may be able to help illuminate not only *environmental* debates and arguments of growing significance in countries like the UK, but also contemporary cultural and political syndromes of more general significance. (To illustrate this, the relevance of the Phase 2 work to two more specific, though sharply different, current concerns - '*Social Intelligence*' and *the Human Subject*, and *CSEC and the Genetically Modified Food Debate* - is considered briefly in a separate Coda below).

Although a range of journal articles, book chapters, and other outputs by BW, RGW, and their Phase 2 Colleagues, reflecting themes from the research, have already reached print, both of the principals are well aware of the urgent need for elaboration of their findings in fully consolidated form. This is now being given priority. BW is well on the

way to completion of what is intended to be a major book on *The Cultural Dimensions of Environmental Risk Discourses*, with a particular emphasis on the varieties of human 'meaning' embedded in scientific representations of nature, and the implications for democracy and 'representation' in 'late modern' society. Less immediate, though also now programmed, is a proposed book by RGW, aimed at locating CSEC, its research findings, its experience, and its rapid development, in the context of an emerging contemporary 'politics of knowledge' and associated reconfigured *religious* discourses of 'the human'.

The importance of separate but *complementary* accounts by the two principals of the developments at CSEC since 1991 is worth emphasising. As explained at the outset of this report, the research aspirations centred on the 'Science, Culture and the Environment' programme have reflected RGW & BW's shared wish to enrich both academic and policy understandings of 'the environment' as a late 20th century cultural form. The attempt has involved the nourishing and sustaining of novel synergies between academic and 'applied' knowledges, across a spectrum of issues and disciplines, whilst at the same time seeking to maintain a proper degree of intellectual integrity and 'detachment'. It has also involved continuing and exacting personal engagements and patterns of negotiation across institutional 'worlds', of innovative and experimental kinds (the *CSEC and the Genetically Modified Food Debate* section below provides something of the flavour of the demands involved). But the important point is, these apparently more 'personal' or 'political' dimensions of the principals' activity (with their CSEC colleagues) have been *integral dimensions* of the overall research endeavour itself.

The underlying thesis has always been that the embedded, existing institutionalised knowledge forms in this domain are limited and increasingly inadequate. It should not be a matter for surprise that determined engagement and interaction with the institutions and the epistemological currents in question, in the pursuit of both genuine 'ethnographic' understanding *and* potential change, has been a demanding and at times uncomfortable process. But such experience has been as crucial a part of the research as the more conventionally 'academic' dimensions. Indeed, in terms of the principals' overall aspiration, this experience can now be seen to have itself constituted some of the most interesting and significant *data* generated for the research, in that, properly analysed and communicated, it helps throw first-hand light on the human dynamics and institutional behaviours of the live 'knowledge cultures' which have been under scrutiny, and which are now experiencing mounting pressure towards adaptation.

Thus the principals are aware of the need now to communicate their integrated findings not only within the academic world, but also more broadly, into the public domain. This will be given major priority over the coming two years. Several significant books have already appeared from the CSEC 'stable': *Risk, Environment, and Modernity: Towards a New Ecology* edited by S Lash, B Szerszynski & B Wynne (Sage 1996); *Valuing Nature? Economics, Ethics and Environment* edited by J Foster (Routledge 1997); and *Contested Natures* by P Macnaghten and J Urry (Sage 1998). All have attracted favourable critical attention. Nevertheless, the need for the fuller story to be told by the principals themselves is now pressing.

Hitherto, the unavoidable pressure to sustain and develop CSEC's research trajectory, and latterly its associated embryonic *post-graduate* teaching/ research programmes, has not allowed time for this. Happily however, new patterns of administrative support from the University - including the creation within CSEC of a group of permanent hybrid researcher-lecturer posts, not least for some of the long-time research associates from the original ESRC-funded programme - now look set to create conditions more favourable for the desirable next stage, through making possible the wider sharing of developmental, managerial and post-graduate teaching responsibilities.

A Coda to the Phase 2 Programme: Two Illustrative Issues

This report has sought to outline the research activities and findings from Phase 2 of the 'Science, Culture and the Environment' programme. It has stressed the dynamic connections between the theoretical and empirical work on individual projects and the wider patterns of intellectual investigation and interaction of the principals and their colleagues in the public world. To convey the essentially exploratory, even creative, nature of the exercise, it seems appropriate to conclude with two illustrative examples of how such processes are working - and may be expected to continue to work, given a fair wind - in practice. Though the examples are different in kind, both embody distinctive features of CSEC's praxis as it has developed - not least the aspiration to more sensitive attunement to emergent cultural and epistemological currents in 'late' industrial society, through the prism of rigorous study of the environmental 'domain'.

1. 'Social Intelligence' and the Human Subject

A major theme to emerge from Phase 1 was the need for richer understanding of (politically and socially significant) tensions arising from embedded instrumentalised conceptions of 'the human subject' in official regulatory tools and discourses, such as risk assessment and cost-benefit analysis. CSEC's development of its own 'ethnographic' use of focus group and other qualitative research methodologies has been one form of response to this challenge. Refinement of such innovations has been pursued iteratively through the medium of a variety of individual research projects, funded not only by ESRC, but also by the European Commission, the Department of the Environment, and industry and NGO bodies. The methods have been discussed and applied in a succession of published CSEC studies (for example, *Public Perceptions and the Nuclear Industry in West Cumbria* (1993); *Public Perceptions of Sustainability in Lancashire* (1995); *Corine: Data Bases and Nature Conservation - The New Politics of Information in the European Union* (1995); *Uncertain World: Genetically Modified Organisms, Food and Public Information in Britain* (1997); and *Woodland Sensibilities* (1998)), as well as in journal articles and conference papers.

CSEC is very far from being alone in Britain in developing new approaches to qualitative social research; the principals and their colleagues have interacted fruitfully with parallel work by UK academic colleagues, for example at UCL (Burgess *et al*), Newcastle (Lowe *et al*), Sussex (Stirling *et al*), Imperial College, London (Durrant & Joss) and Glasgow (Kitzinger *et al*) on such matters, and with that flowing from their EU projects and relationships - for example, in Germany (Renn), Italy (Funtowicz), France (M O'Connor,) and Denmark (A Jamison). In addition, they have interacted with senior 'consumer

research' practitioners, such as Mike Foster of Unilever, Bob Worcester of MORI, Ian Christie of the Henley Centre and Demos, and John Scott of KSBR (the latter a CSEC Honorary Research Fellow). Constructive dialogue has also begun to advance with environmental economists at CSERGE, Cambridge and elsewhere, around possibilities for a greater measure of integration of qualitative and quantitative approaches to environmental 'valuation' - a process we anticipate will gain momentum under the umbrella of the forthcoming 'Deliberative Institutions' seminar network, conceived and co-ordinated by the new Environment and Society Research Unit at UCL, with support from ESRC's GEC programme. And finally, of course, it should be added that the use within government of qualitative methods for assessing public opinion has become of mounting significance since the advent of the 1997 Labour Administration.

Notwithstanding the interesting activities of others, CSEC's own particular internal culture has been proving peculiarly suitable for encouraging reflection on conceptual features and implications of these developing techniques, their *raison d'être*, and their possible implications. Through a series of internal seminar programmes, co-ordinated by CSEC Research Fellows with colleagues from Lancaster's well-regarded Philosophy, Sociology, Linguistics, and Theatre Studies Departments, considerable progress has been made in unravelling the ways in which different mechanisms for encouraging the 'articulation' of values (whether quantitative methods like opinion surveys, or qualitative methods like focus groups) themselves appear to be *productive of* different patterns and characterisations of value - and hence the reality that the researcher him/herself may play unavoidably a major role, through the design and choreography of any chosen technique, in 'constructing' not only the responses, but also the very notion of *the individual subject's field of possibilities as a human being*, in the particular contexts of inquiry.

The implications of this and similar findings appear to be considerable. Not only do they underline the material significance of issues of *framing, trust, and perceived possibilities for agency*, in the design of social research aimed at informing action by public agencies or the corporate world, but they point also to an inescapable reflexive need for greater self-awareness by social scientific, not to mention *natural* scientific, researchers themselves of ways in which their own visions of the human subject may necessarily be helping to shape social reality (hence our own 'observation' of the syndrome). This is far from a matter of simply arcane academic interest. CSEC's own researchers have found, through their design and use of qualitative group research methods in such highly contested contemporary arenas as genetically modified foods, nuclear waste disposal, and recreational access to the nation's forests, that dominant research methods relied upon officially in such domains may have been persistently, if 'innocently', misrepresenting crucial human realities at stake, through inadequate recognition of these normative dimensions - with increasingly evident consequential difficulties for the progress of constructive policy development in such arenas. Urgent consideration is now being given to publishable outputs on the issue of society's need for processes of better *social intelligence* in relation to such matters, in the complex cultural circumstances of 'late modernity'. A further possibility is that the more deliberative and interpretative research methods of the kind being fostered in CSEC's research may also have a potential contribution to make in discussions about emerging media of political expression, negotiation and even 'representation', in current circumstances of democratic evolution.

The fruits of CSEC's constructive reflections and on-the-ground experiments on these issues have now begun to attract serious interest within bodies such as the Environment Agency, the Royal Society, and the Royal Commission on Environmental Pollution (for whose Commissioners CSEC and Philosophy colleagues arranged a private seminar, at the formers' request, in October 1997). But in the present context, the point is simply that the *sequence* of events outlined here - a progression from theoretically-informed hunches about social phenomena, to methodological *experimentation*, to a range of empirical studies, to sustained collective internal debate and reflection also involving close colleagues from a range of further disciplines, to fresh 'philosophical' and conceptual insights, leading (ideally) to further consolidation and application of the new understandings over an ever-widening field - could be taken to stand as one model for the kinds of *below-the-radar* 'research' praxis, and associated theoretical development, which has been nurtured increasingly at CSEC through the ESRC's Phase 2 funding.

2. CSEC and the Genetically Modified Food Debate

The thickening controversies since 1995, surrounding the proposed introduction into Britain of genetically modified plants and foods, offer a further illustration of CSEC's outputs, putative influence and general *modus operandi*, particularly its aspiration to act constructively at the interfaces of the worlds of academic research and theory, the emerging social/environmental dimensions of contemporary technology, and public policy innovation.

In 1995, building on work within the 'Science, Culture and the Environment' programme, CSEC (through Visiting Research Fellow, Sue Mayer - now the director of Genewatch) took the initiative, with the Green Alliance and ESRC (as funders), to stage a series of high-level seminar-workshops in London for key regulators, officials, industrialists, and NGO representatives on the issue of burgeoning latent public concerns about genetically modified plants and foods. A number of members of relevant Ministerial Advisory Committees participated energetically, stimulated (it appeared) by CSEC's perspective, which shaped and informed much of the discussion. The conclusions from the workshops were then published and disseminated by ESRC, highlighting serious limitations in the existing political-regulatory framework for reflecting some of the more significant - in present terms, elusive to 'science' - public concerns about genetically modified plants and foods. Subsequently, in 1996-1997, the predicted public controversies began to surface around precisely such issues.

CSEC's intelligence on such matters was well-attuned, given the multiple parallel roles of the principals in, for example, the European Environment Agency, the Biotechnology and Biological Sciences Research Council's 'Expert Group on Public Responses', and the European Biotechnology Federation Task Force on Public Perceptions (all BW), and the Green Alliance, Greenpeace, and Forestry Commission (all RGW). It also benefited from a range of academic interactions with Levidow (OU), Stirling (Sussex), Jasanoff (Cornell, now Harvard), Beck (Munich), Frewer (Reading), Irwin (Brunel) *et al*, as well as informal contacts with the European Parliament, the appropriate Ministerial Advisory Committees, and other institutions. In late 1996, in the thick of the controversy building vigorously between Greenpeace, Unilever, Monsanto, the Ministry of Agriculture and others, CSEC was invited, as part of an innovative collaboration between leading NGO

protagonists and Unilever, to propose and execute qualitative-interpretative research that might clarify the public issues at stake. The result was the 25,000 word report, 'Uncertain World' (see above), which attracted attention as a major contribution to - and, on the evidence of the Rapporteur's report to the Secretary of State for the Environment, a significant influence on - the Government's March 1997 'National Biotechnology Conference'. In this developing context, both of the principals were invited to present lead papers at a succession of high-level conferences and seminars - for example, at the Royal Society, and Foundation for Science and Technology (RGW); and at RURAL, the Department of Health, and the Health and Safety Executive (BW) - as well as contributions to media and other discussion (Newsnight, Analysis (Radio 4), etc). It led also to subsequent close contact with a range of influential contributors to public discussion of such matters, including the Prince of Wales, and (with Phil Macnaghten) to further independent studies 'sponsored' by Unilever, on the more general issue of *Information as Regulation*, now under way. Recently, the Christendom Trust has funded a new CSEC project, with Bron Szerszynski and Dr Celia Deane-Drummond, a theologian at Chester College, exploring possible 'implicit' religious implications of public sensibilities towards GMOs - a project which is already showing signs of enriching the 'human subjectivity' concerns arising from the ESRC-funded programme. In addition, BW (with Peter Simmons as Research Fellow) is now co-ordinating a five-nation comparative study of cultural perceptions of GMO foods and plants with leading centres in France, Spain, Germany and Italy, funded by DGXII of the European Commission.

All of the principals' distinctive contributions to these GMO debates, particularly 'Uncertain World', have relied crucially on the combination of innovative social-theoretical perspectives and cross-boundary interactions made possible by CSEC's ESRC GEC-funded research programmes between 1991 and 1997 and the sustained high-level interactions with a wide variety of policy world actors and institutions over the same period. The fruits of this in the GMO food field are beginning to show, embryonically, at several levels - in CSEC's nibbling influence on the basic *terms* of UK public debate, in the provision of a model for novel and promising research synergies between new patterns of academic social science and strategic thinkers within industry (and government), and in the fertilisation of novel over-arching theoretical and political-philosophical reflections, on issues of mounting 'environmental' importance in the post-GATT world.

Thus, the principals would argue that the recent and on-going saga of Genetically Modified Foods in Britain constitutes a second helpful illustrative example of the ways in which, with ESRC's support, the Phase 2 period has fostered further testing and development, confirming (it is suggested) the resilience and the potential social productiveness of CSEC's now consolidating intellectual perspective.

Finally, the principals would wish to express their gratitude, not only to ESRC for its substantial support of their work over a sustained and productive period, but also to their many colleagues at Lancaster University, and within wider networks, who have contributed so creatively to their joint efforts. Lancaster University provides as friendly, stimulating, and intellectually generous a context as one could hope for, for such an enterprise.

Annex A

Findings from the specific 1994-1997 Component Studies

ANNEX A

FINDINGS FROM THE SPECIFIC 1994-1997 COMPONENT STUDIES

This Annex reports on key findings from the five individual elements of the 1994-1997 Research programme, 'Science, Culture and the Environment: Phase 2'. It should be read alongside the main report summarising the cumulative findings from the programme as a whole.

A. MODELS AND ENVIRONMENTAL POLICY DEVELOPMENT

Research Approach

This study has built on, and consolidated, the Phase 1 analysis of social and institutional dimensions of global climate models, particularly General Circulation Models (GCM) in the UK and US. It has extended this analysis to explore the interactions between such models and the policy world, as well as the processes of cross-disciplinary interaction involved in the development of Integrated Assessment Modelling (IAM) of climate change impacts, and, more specifically, the implications of such key socially negotiated concepts in climate modelling as 'Global Warming Potential' (GWP) and 'Flux Adjustment' for policy world interpretations of uncertainty. The study (Research Fellow: Dr Simon Shackley, with BW) has involved extensive collaboration between CSEC's social scientists and senior environmental modelling colleagues (particularly Professor Peter Young) at Lancaster's Institute of Environmental and Natural Sciences, as well as continuing interactions with the Hadley Centre of the UK Met Office and cognate US centres, Inter-Governmental Panel on Climate Change (IPCC), and collaborating social and natural scientists in the US, Netherlands and Germany. There has also been considerable cross-fertilisation between this project and an associated 5-nation EU-funded study, Ulysses (Urban Lifestyles, Sustainability and Integrated Environmental Assessment), of which CSEC has been the UK arm.

Key Findings

- The analyses of GCMs, GWPs and Integrated Assessment processes suggest that, contrary to conventional assumptions that greater precision in scientific understanding tends to translate into more effective policy promotion, ambiguity in scientific meanings has been proving positively useful, in assisting consensus-building amongst disparate groups seeking workable ways forward. Calculated *flexibility* in precise meaning - for example around the issue of 'climate sensitivity' - appears to be permitting the incorporation of new scientific information as it emerges, whilst holding *public* definitions stable. This has advantages for both the wish of scientific communities for intellectual adaptability, and the need of policy communities for stability and continuity. The associated risks include a potential vulnerability to hostile, 'interests'-driven critique (as was evident, for example in the run-up to the 1997 Kyoto Climate Convention Conference), and a possible tendency to feed public scepticism towards future political assurances of 'confidence' and 'objectivity' on science-based policy issues.

- A variety of claimed roles have been identified for GCMs, and increasingly IAMs, in different contexts, suggesting the potential for future political confusion and even conflict. The research has identified at least five such: as *intellectual probes* for exploring relationships and processes; as *encyclopaedias* for aggregating and storing a vast range of data and experience; as *truth machines* for generating predictions for use in policy arenas; as *symbolic prompts* to policy action, flowing from rhetorical claims that they represent objective 'truth'; and as *tools for interaction* between scientific communities, for example between individual disciplines or even between scientists and model users. In the policy world, different particular 'roles' are often invoked for GCMs somewhat opportunistically. It appears that such ambiguities in meaning, intent, and interpretation may constitute preconditions for enabling different scientific and policy communities to come together in support of approaches towards particular shared concerns. However, the same ambiguities may also be creating medium-term vulnerabilities for the claims to *public* authority of the outputs from modelling processes. This fundamental tension, surrounding potentially incompatible epistemic identities across the science-policy boundary, appears to be a new finding - reflecting the multivalent character of scientific knowledge and its contextual shaping - with several possible implications for policy (see below).
- We have found that one consequence of the scientists' intuitive handling of the ambiguous identity of global climate scientific knowledge is the likelihood (confirmed in our research as typical) of policy actors' underestimation of the *uncertainties* embedded in global climate predictions. A detailed sub-study of the attitudes of scientists on both sides of the Atlantic to the technical practice of 'Flux Adjustment' in coupled atmosphere-ocean GCMs has thrown further light on this issue. Whilst we have encountered gradually increasing willingness to debate the surrounding contingencies openly in non-specialist contexts, such contingencies tend still to be represented as, in the principals' terms, *deterministic uncertainties* (ie as supposedly born from lack of precision) rather than as authentic *indeterminacies*. We have identified as a major issue yet to be addressed, the question of how responsibility for deep societal commitments in the face of such open-ended indeterminacies might more appropriately be distributed between scientists, policy actors, and wider public fora. This relates in turn to findings elsewhere in CSEC's Phase 2 programme, concerning the as-yet under-recognised importance of '*non-knowledge*' in the contemporary politics of risk (for example, as found in the joint CSEC-Munich cross-cultural comparison of official risk-scientific handling of BSE in the UK and Germany, a study which has been acting as a medium for direct BW-Beck theoretical interaction on such matters) - and to wider issues of public 'deliberation' of environmental values (Study C, see below).
- Close empirical scrutiny of the GWP and IAM issues has identified a tendency for scientific outputs to be felt more credible, because less potentially controversial, when contributing to analysis and discussion of 'upstream' (physical and ecological), rather than down-stream (social and economic) costs or impacts of climate change, even though such 'upstream' knowledge may in fact be instrumentally less useful for direct policy reflection. This again highlights ambiguities in political-rhetorical claims for the authority of the scientific knowledge base, suggesting a case for supplementary, more 'local' or vernacular representations of the issues to be actively encouraged *in parallel*. Findings on this latter issue have been enriched through interaction with other CSEC studies - for

Lancashire County Council, Going For Green, and DG XII - exploring gaps between 'expert' and 'local' environmental discourses.

- Simulation models such as GCMs and IAMs, aiming to represent complex environmental systems for policy purposes, have been confirmed to embody unacknowledged reliance on a range of tacit commitments and projections of human kinds - reflecting for example the viability of prediction within such systems, implicit assumptions about present and likely future global policy orders, and the potential for cohesive action of the sovereign political units involved. The research has found that in practice such tacit assumptions act as normative influences amongst modellers, with potentially significant, but largely unrecognised, implications for public identification with, and take-up of, the resulting expert scientific projections.
- The concept of 'extended peer review' has been used to throw light on the relative success of the Inter-Governmental Panel on Climate Change (IPCC), a number of whose Working Group meetings were attended and analysed in the course of the research. The role of *witnessing* - particularly the active and visible involvement of key policy and scientific actors at decisive stages in such processes of drafting and scientific consensus-building - has also proved significant. Insight into such social processes - for example at the November 1995 Madrid meeting of IPCC Working Group 1 - has benefited from wider CSEC investigations and discussion of contemporary processes of 'deliberation' (Study C) and social association (D).
- Overall, the study has confirmed that international climate science, and the ways in which it connects institutionally with policy processes, is now beginning to face distinctive and arguably growing problems of public identification and engagement. These appear to reflect, inter alia, the thinness of appropriate pre-existing institutional and cultural supports at both supra-national and *local* levels. Within national policy systems, such routine supports appear to have been taken for granted to such an extent that attention to nourishing them in the new context of 'international environmental science and policy innovation, plus *local* implementation' has been minimal. Our analysis of this issue has been reinforced by findings from other parallel CSEC studies, such as the five-nation EU 'Ulysses' project, work with Sustainability NW, Lancashire County Council and other NW bodies on public understanding of climate change impacts in the region, and, with Greg Myers (Linguistics), Bron Szerszynski (CSEC), Mark Toogood (CSEC), & John Urry (Sociology), an ESRC-funded study on 'Global Citizenship and the Environment'. We judge it to constitute a major political challenge for the future.
- The study has also enabled exploration of more generic issues arising from the different patterns of use of modelling in a variety of contemporary policy arenas beyond that of climate policy alone, such as the economic and transport policy domains. These investigations have confirmed the importance of a detailed appreciation of the institutional and social context in which any given model is to be used, for a realistic evaluation of the efficacy of that model's distinctive characteristics. The more politicised the context, the more searching the likely challenges of outsiders concerning a model's constituent features are likely to be, and vice versa. A book-length (June 1998) special issue of the journal, *Impact Assessment and Project Appraisal*, edited by Dr Shackley, has explored this issue in detail, through integrated consideration of perspectives from several policy domains, following the project's multi-disciplinary ESRC-funded workshop in March

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Simon Shackley has also acted as Guest Editor for a special issue of the journal *Impact Assessment and Project Appraisal* (Beech Tree Publishing) from the outcome of a Workshop entitled "The Use of Models in Policy Making: Towards a Comparison and Evaluation of Experiences" held 10-11 April 1997. This Workshop was held with ESRC Seminar Series funding but relates to the work undertaken as part of this grant. This issue was published in June 1998.

B. DATA BASES AND EUROPEAN ENVIRONMENTAL POLICY

Research Approach

This study has focussed on the processes of harmonisation and standardisation of environmental knowledge at European Union level. It has examined the ways in which tensions between local, cultural provenances of environmental data and the pressures for common cross-cultural standards of understanding and implementation of environmental policy and legislation are being handled, and with what wider political implications. Empirical attention has focussed especially on pan-European systems of vegetation classification, on national implementation of the Habitats Directive in France, Netherlands, Germany, Sweden and the UK, and on the evolving data assembly and dissemination practices of the European Environment Agency (EEA). (Earlier proposals to explore, in parallel, ECE Critical Loads regimes were sidelined, in view of the wealth and interest of the data to emerge in the vegetation and habitats domains). The Research Fellow on the project (Claire Waterton) worked closely with BW and Dr John Rodwell, Director of Lancaster's nationally recognised unit of Vegetation Science, building on productive working relationships both with key EU networks of vegetation scientists, and with officials of the EEA and its relevant Topic Centre. Interactions with cognate American researchers at Cornell and Harvard Universities have been resulting in further cross-cultural comparisons.

Key Findings

- Comparison of the development of two different trans-national vegetation classification systems at EU level, those of DGXI and of the independent European Vegetation Survey (EVS), has underlined the significance of resilient social networks amongst scientists for helping generate a sense of common identity within which constructive (if critical) scientific debates and negotiations about harmonisation processes are able to take place. Such patterns of attachment appear to have been stronger within the EVS than within the looser DGXI networks, contributing towards a higher degree of trans-national 'ownership' of the resulting 'standardised' classifications. This finding confirms the *substantive* significance of such tacit social processes for the subsequent authority of the resulting scientific-descriptive classification data themselves.
- The lack of fora in which appropriate patterns of trust can be fostered and culturally sensitive compromises forged appears to have been a serious source of difficulty for the Commission, in its endeavours to create a unified habitat classification system for the EU as a whole. The complex and labile EU political culture of 'subsidiarity' - manifesting itself, for example, in inconsistency by some member state governments in relation to the sharing of their own habitats data - has acted to discourage the emergence of such fora.
- The same issue has also been examined in relation to the developing context of DGXI's environmental information systems, following from the creation of the European Environment Agency. The long-established CORINE system - critically examined in an earlier (Phase 1) CSEC study - has given way to two new systems (the Palearctic classification and EUNIS), resting on broader bases of expertise, a greater degree of congruence with other such EU systems, and a reduced pressure to *standardise*. Whereas the contents of CORINE in the 1980s and early 1990s had

reflected DGXI's supposed need for 'black-boxed' data to help drive forward immediately required EU-level legislation, the successor classifications are tending now to reflect the more strategic concerns of the EEA, enabling different patterns of 'negotiation' to be encouraged. However, this more diversified conception of relevant environmental knowledge production and use processes also faces distinctive problems of its own (concerning resource availability and member state political pressure).

- Notwithstanding these various differences, we have noted signs of certain emerging similarities between the European-level institutional worlds of 'independent scientists' like those within the EVS, and those of Commission (including EEA) officials. Whilst the greater diversity of 'experts' now called upon by the Commission, and a growing sensitivity towards 'policy' issues by EVS scientists, are both constructive developments compared with the previous situation, there are now associated anxieties that 'science' may risk being defined increasingly by its potential policy utility, with an associated loss of independent authority. This appears to strengthen the case for ever-greater reflexive self-awareness on the part of the institutions concerned, vis a vis their own knowledge-generation and classification processes. This may have implications for the modes of 'expert' knowledge needed *within* such institutions.
- Investigation of implementation of the Habitats Directive in several EU member states (see above) has found that, far from encouraging a greater degree of 'European' awareness in relation to nature conservation values or practices, the policy of which the Directive is the expression is simply being absorbed, largely unremarked, into the various national frameworks. Thus whilst there have been minor adjustments of practice in certain contexts - for example, in relation to surveys, site identification, and public notification processes - we have encountered little awareness of the Directive's claimed significance of consequences beyond particular national borders. Each member state appears to have its particular cultural lens through which the Directive becomes refracted and re-made, to become locally nuanced and particular as it is incorporated into national or regional policy development. We have found however that EU policy actors continue to find it difficult to come to terms with such a picture, given their levels of embedded pre-commitment to more 'European' impacts.
- More generally, we have found that EU environmental policy institutions, such as DGXI, have been tending to operate with a rather restrictive concept of 'policy', resting on a somewhat formalistic model of policy implementation and enforcement. The forms of 'science' developed in support of such a policy culture have tended also to be overly standardised and bureaucratised, leading to tensions with scientific research communities, concerning matters such as peer-reviewing, updating to state-of-the-art understanding, accountability, and intellectual quality. The EEA is attempting to cultivate a more 'civil society'-oriented model of public policy and its environmental actors and inputs. But this more diversified approach is having to wrestle also with countervailing political and resource pressures. The study has found that the knowledge-forms and institutions of EU environmental policy harmonisation tend *mutually to construct* one another as they develop (in a fashion corresponding to that referred to vis a vis international climate science and policy, under Study A above). These findings open up a new set of policy issues for the institutions involved, relating to their handling of the interfaces between public

concern (expressed largely within national borders) and expert knowledge (seeking to transcend such borders).

- European environmental policy development has been taking place within a context of continuing member state sensitivity about 'sovereignty', in parallel with expectations of progressively greater integration on certain issues (environmental safeguards, for example). Such conflicting pressures have been encouraging a continuing tendency for EU environmental issues to be defined in standardised a-cultural terms, with a corresponding understatement of the institutional and cultural variations which, in reality, pervade environmental knowledge-generation and use at the more local level. The study has thus identified a need for a subtler and more self-conscious balance to be encouraged and articulated, holding in tension the drive towards universalistic representations of the issues at stake (vii standardisation processes etc), and the need to reflect and acknowledge local conditions. The fact that, hitherto, technical discourses and methods have not been developed or deployed with such tensions in mind has been contributing to the wider deficit of public engagement with environmental policy aims and instruments at European level - and indeed, to wider currents of latent public unease about the 'responsive' capabilities of EU institutions more generally.
- These findings may have implications for the potential future staffing of both EU institutions and the *national* bodies which interface with them, as well as for patterns of desirable EU research strategy. The conditions under which trans-national knowledge systems can be made both coherent intellectually and culturally, and credible to the national/regional governments and populations likely to be affected by them, is of growing political and economic significance. This is not a problem peculiar to the environmental sphere alone, but this sphere, closely scrutinised, provides useful pointers. CSEC's growing body of experience of multi-national EU (DGXII-funded) 'environmental' research projects, in parallel with the present ESRC-funded programme, has revealed the problems and potentialities in such comparative studies, in relation to the ever-proliferating social and cultural issues thrown up by continuing processes of EU integration. Many of these are inadequately mapped or understood by the institutions driving them. We are intending to publish on this issue shortly.

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C. ENVIRONMENTAL VALUATION: METHODS AND NEGOTIATION FRAMEWORKS

Research Approach

This was a one-year study, building on earlier Phase 1 work examining questionable conceptions of the human subject embedded in neo-classical economic approaches to environmental valuation, particularly 'contingent valuation' (CV). The Phase 2 project has focussed on the apparent paradox that whilst philosophical and sociological critiques of CV and other surrogate valuation methods (by CSEC and others) have been growing in authority, the methods' apparent attractions for Government departments and agencies have continued to encourage their operational deployment. Co-ordinated by the project's Research Fellow John Foster, with RGW, there has been close and continuing collaboration with Dr John O'Neill and Alan Holland (both of the Philosophy Department), as well as productive interaction with economists, sociologists, and geographers on the comparative four-nation EU project, 'Social Processes for Environmental Valuation', for which the CSEC-Philosophy team are the UK partners. There has also been interaction with complementary work at UCL, Newcastle, and CSERGE. Empirical dimensions of the project have involved case study scrutiny of praxis within the Forestry Commission, as well as interviews and other discussions with a range of government officials on their understanding and use of 'surrogate valuation' methods. There have also been increasingly constructive exchanges with CV economists on the potential significance of qualitative 'deliberative' approaches to public sensibilities emerging from the study. Publication (in 1997) of the book, 'Valuing Nature? Economics, Ethics and Environment', based on the two Phases of the project, has generated growing interest in the approach developed, on both sides of the Atlantic, particularly within the UK Environment Agency and the Royal Commission on Environmental Pollution.

Key Findings

- It has emerged as significant that, in the UK, CV and other surrogate valuation methods are used overwhelmingly in government departments and agencies - particularly in negotiations between departments/agencies and the Treasury - rather than as elements in broader vernacular public discussions and debates about issues of environmental 'value'. Equally, where such methods are used by NGOs such as RSPB, this has been found to arise generally from attempts by such bodies to work with the grain of perceived departmental or agency requirements, in order to gain political purchase, rather than from NGO conviction that the methods genuinely capture their members' concerns. (This finding is consistent with recent qualitative post-CV analysis by Burgess et al, at UCL). Such pointers have confirmed that the apparent purchase of the methods needs to be understood in the context of particular institutional drives and perceived necessities of contemporary UK bureaucratic government.
- Close scrutiny of the employment of CV in 1994-1996 to generate figures for the annual public expenditure (PES) negotiations of the Forestry Commission has identified (a) the operational importance of the figures so generated in securing UK Treasury approval of 'biodiversity' values in the Commission's programme of budgeted activities; (b) the range of socially contingent tactical judgements made within the Commission's expert steering group and other 'backstage' informal

technical fora, in helping the consultants shape the CV processes and outputs (concerning, for example, the plausible range of economic values to be offered to CV survey participants, the handling of 'protest' bids, the precise pictorial representations of the biodiversity 'options' on which opinions were to be sought, and a host of other matters of substantive significance); and (c) the subsequent processes of unambiguous institutional 'closure' around the numerical CV values adopted, and their rhetorical public endorsement as implicitly 'factual', by the various parties involved.

- Such empirically grounded observations - the first of their kind in the UK in relation to an on-going valuation exercise by a public agency, we believe - have confirmed the extent to which surrogate valuation exercises, hitherto advocated publicly as transcending messy 'political' subjectivities, themselves rest on intensely social processes. However, we have found not only that such social dimensions are unacknowledged as such (indeed, are effectively denied) publicly, but also that their significance is largely unrecognised privately by the 'experts' actually involved in the social processes themselves. This appears to reflect the fact that the discussions (ie the 'social processes') take place in largely informal 'technical' contexts, such as meetings of steering groups, between consultants and clients, or between Treasury and agency officials, with the result that their wider normative political significance tends to be disguised even from the participants themselves. With the growth of controversy over particular applications of surrogate valuation methods (for example within IPCC Working Group 3, and in the recent (1998) Environment Agency-Southern Water Kennet watershed abstraction decision), this is an issue with potentially far-reaching political and public expenditure implications. It suggests that implicit social judgements on politically sensitive environmental policy issues are being made routinely by officials, within the framework of a supposedly 'objective' technical calculus.
- Our published outputs from Phases 1 and 2 have argued that, rather than constituting unambiguous algorithmic representations of environmental value, as their key academic protagonists imply, CV and other surrogate valuation methods are best understood as means for generating negotiating counters for use between government institutions seeking bases for shared defence of particular resource allocation judgements. CV outputs need thus to be seen as heuristics, contrived to focus attention on otherwise under-represented values, rather than as direct 'objective' decision aids. Their vulnerabilities in the latter role are related directly to questionable assumptions deep within neo-classical economic epistemology about the ways in which human subjectivity is constituted - assumptions which ignore the extent to which 'values', environmental or otherwise, evolve and crystallise through processes of social interaction and negotiation.
- However, notwithstanding these limitations, our appreciation of the operational advantages within government of such methods has been enriched both by the Phase 2 interactions with departmental 'users' and environmental economists themselves, and by political science insights of Porter ('Trust in Numbers'), Ezrahi ('The Descent of Icarus') and others. These have assisted new lines of inquiry into both the theoretical and the practical possibilities for complementing numerical methods with more 'deliberative' approaches for establishing public environmental values in particular circumstances. These attempts are drawing also on the experience of a range of parallel projects within CSEC, involving the use of focus groups, citizen panels and citizens' juries - which collectively have thrown light on

the extent to which different institutional frameworks and social processes actually generate different values, rather than simply 'discovering' them, as tends to be implied by conventional CV and polling methods.

- Work on these lines has profited especially from the sustained partnership with Lancaster's Philosophy Department, which has extended also to a cognate further EU (DG XII-funded) four-nation *Social Processes for Environmental Valuation* project (1995-1998), co-ordinated by Dr M O'Connor of the University of Versailles, France. The UK end of this project, involving collaboration also with environmental economists at Cambridge University, has broken new ground in comparisons of specifically designed CV and 'Citizens' Jury' processes, in relation to the values at stake in 'Wet Fen creation' proposals in Cambridgeshire. The findings have added further empirical refinement to those from the ESRC-funded study, concerning the implicit social 'negotiations' built into apparently technical valuation devices - whilst also demonstrating 'deliberative' potentialities (and limitations) of citizens' juries in the context of UK political culture.
- The book reflecting much of the CSEC/Philosophy Department group's work in this domain, *Valuing Nature? Economics, Ethics and Environment* (Ed: J Foster. Routledge, 1997), has been attracting increasing interest from official agencies and other government bodies. At the request of the Royal Commission on Environmental Pollution (RCEP), a private one-day seminar was mounted at Lancaster for Commissioners, in October 1997, resulting in a further sequence of interactions with the RCEP's current 'Environmental Standards' study. Similarly, the group played a significant role in the conceptualisation and development of a landmark June 1998 workshop of the Environment Agency, on deliberative processes for environmental valuation. These developments are likely to gain further momentum, with the new CSERGE-UCL(ESRU)-CSEC 'Deliberative Institutions' network and conference programme, co-ordinated by Professor Jacquie Burgess of UCL, with ESRC's support.
- Reflections on wider issues of *judgement* and *value as social creativity*, flowing from the project, have led to internal CSEC exploration of the potential pedagogical implications, particularly for university teaching and course design. Most immediately, these are beginning to be reflected (and tested) in the intentions and structure of the new full CSEC MA on *Environment, Culture and Society*, which builds on CSEC's earlier cross-disciplinary MA modules on 'Environment and Culture'.

Selected Dissemination

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- Grove-White, R. (1997), 'The Environmental Valuation Controversy: Observations on its Recent History and Significance', in J. Foster (Ed), *Valuing Nature? Economics, Ethics and the Environment*, London, Routledge, pp21-31.
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- Darier, E., Foster, J., Grove-White, R., Holland, A., O'Neill, J., (1997), 'Environmental Standards and New Deliberative Institutions', CSEC Paper to Royal Commission on Environmental Pollution, Lancaster: Centre for the Study of Environmental Change.
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- Holland, A. (1998) 'Environmental Valuation: Making Room for Ethics', *UK CEED Bulletin* 53: pp15-16.
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D. SUSTAINABLE DEVELOPMENT AND ENVIRONMENTAL ETHICS; A RELATIONAL APPROACH

Research Approach

The hypothesis of this study has been that attempts to secure wider public participation in, and identification with, the pursuit of sustainable development objectives are being hampered in the UK by continuing 'official' reliance on reductionist, 'modernist' philosophical assumptions about the nature of the human subject.

Through (a) a critique of the model of the subject embedded in dominant sustainable development discourses, and (b) empirically-based investigation of the notions of human flourishing animating contemporary grass-roots cultural movements, the project (Research Fellow: Dr Bron Szerszynski) has sought to explore the significance of more sophisticated accounts of human moral experience in contemporary society for potential advances in sustainable development on the ground. There have been close interactions not only with Studies C. and E, and with collaborators in the Philosophy, Religious Studies, and Sociology departments, as well as with other on-going CSEC work, such as the 'Going for Green: Pilot Sustainable Communities' project in Burnley and Ecclestone, with Lancashire County Council. As the project has developed, its insights have contributed centrally to CSEC's growing interventions in national policy debates on themes such as *risk*, *trust*, *public 'deliberation'*, and *social cohesion* in contemporary Britain. A number of publications have resulted, and a book on the project is under development.

Key Findings

- Analysis of key sustainable development texts (including the Brundtland Report, the EU's Fifth Action Programme- 'Towards Sustainability' -, UK Government White Papers and Local Agenda 21 documents) has confirmed that limitations in the implied picture of the human subject therein are a likely source of weak public identification. Several factors have emerged as relevant: First, the pervasive dominance of natural science idioms in characterisations of sustainable development is tending to encourage an implicit sense of the person as detached individual observer rather than involved social actor. Second, the embedded instrumental model of human agency within such idioms occludes the ways in which human action is in fact characterised by expressive meaning, constituting the 'locus' within which identities and values are formed, and frequently involving an orientation towards *internal* goods. And third, characterisation of the *ethical* dimensions of sustainable development appears to be being vitiated by a dominant focus on 'dramatic' single personal *decisions*, on the application of abstract rules, and on persons in the abstract. Our suggestion is that, collectively, these various shortcomings may be contributing significantly towards the public fatalism and detachment noted in recent studies by CSEC, Burgess et al, and others, towards local sustainability initiatives (and indeed towards current official discourses of shared collective action more generally). Such findings have underlined the urgent need for better understanding of the phenomenology of engagement and commitment as it is actually occurring 'spontaneously' in contemporary society, as arguably a precondition for more intelligent and productive official interactions with

'the public' - hence the significance of findings from the empirical elements of the present study (see below).

- Through qualitative investigation of four contrasting contemporary 'cultural movements' reflecting 'lifestyle' concerns - cycling, concern for animals, alternative medicine, and intentional communities -, the study has begun to generate fresh insight into relevant issues. Building on groundwork from Phase 1, it has established the importance for members of social and cultural movements, voluntary associations and lifestyle communities alike of the 'psychic' goods' gained through involvement. These have been found often to be highly *relational* in nature, above and beyond the surface goals pursued by particular groups. *Interpretation* of the material generated through carefully designed interviews and focus group interactions has drawn on a process of intellectual integration of a range of different social theoretical understandings, hitherto applied discretely to particular kinds of cultural movements (for example, religious movements, social and political movements, leisure cultures, and youth sub-cultures), in order to clarify such movements' shared features in more appropriate terms. At the same time, the attempt has been made to retain ways - indeed, to develop new and more nuanced ways - of distinguishing between the diverse forms of contemporary voluntary collectivity, such as, for example, leisure 'movements', pursuing practices (sports, crafts, self-improvement...) more or less for their own sakes, and protest movements (environment, animal welfare, health) having more purposive orientations. A range of journal articles and conference papers on these matters has been produced (see below).
- Thus a new and distinctive theoretical space has been mapped out within the project, between the conceptualisations of theorists of individualisation and reflexivity (Beck, Giddens) and those emphasising community and the situatedness of the self (Sandel, Taylor); as well as between theorists emphasising expressive and affective characteristics of social and political collectivities (Hetherington, Maffesoli, Melucci) and those stressing their purposiveness and instrumentality (Zald and McCarthy). This attempt has involved development of the notion of the 'community of practice', building on Aristotelian notions of *praxis*, *eudaemonia* and *the virtues* as theoretical tools for exploring the grammars of belonging, commitment, and purpose, operating within contemporary cultural life, initially through the prism of the four case studies.

The key findings of this element of the project are now being developed in a book by Bron Szerszynski, provisionally titled *Communities of Practice: Identity, Sociality and Purpose*. The core argument suggests that:

- Dominant characterisations of contemporary cultural change in terms of individualisation and loss of community (eg Heelas...) need radical re-evaluation, even in the case of those geographically and culturally more mobile sections of society to which it is supposed most particularly to apply. The loosening of the bonds of communities into which people are born is better understood less in terms of individualisation and increased autonomy, than in terms of shifts towards embeddedness in different *kinds* of community - chosen, rather than ascribed, and often highly dispersed in character - which perform many roles more often associated with earlier, less 'chosen' communities such as those of religion and geography.

- For many of their members, such 'communities of practice' appear to be grounding a substantive notion of the 'good life', of what it is to flourish as a human being. Increased geographical, social and cultural mobility seems not to be resulting in a *retreat* from substantive notions of the good, but rather in the *proliferation* of such notions. Participation in cultural movements is thus not simply 'reflexive', as if individuals measured participation against its effectiveness in delivering external goods (pace Giddens), since individuals' very idea of what is worthwhile is *itself* shaped through participation in the practices of the 'movement' in question.

- Although people's life narratives may now be more complex than they tended to be in more settled societies, the notion of individuals navigating reflexively round the increased options that life presents for them is questionable (pace Beck). Respondents within the research have been found to be seeking to understand their lives as whole meaningful stories, making decisions in the light of their implications for the coherence of the whole. In particular, 'joining' a cultural movement was often narrated as coming 'home'. Indeed, for many individuals the strongest sense of home seemed to be in relation less to the communities of fate into which they were 'thrown' by accident of birth, than to the experience of finding a new, chosen or even invented community.

- A key implication for 'sustainability' appears to be that initiatives to promote it need to offer a broader range of 'psychic goods' than simply an individual sense of having done the 'right' thing. The encouragement and nurturing of voluntary associations and networks is thus vital. If 'sustainability' initiatives are to go beyond the making of appeals to individuals, they need to find ways of engaging with the web of cultural networks that have emerged spontaneously within civil society. Further more, even those networks that appear not to contribute directly to sustainability goals need encouragement, since they help create necessary cultural pre-conditions, by increasing the overall 'social capital' of trust and public-spiritedness in the public sphere.

- Not only has the study involved continuing interaction with Study C, and with a wider range of Lancaster colleagues - within the Philosophy, Sociology, and Linguistics Departments -, it has also enriched discussions within CSEC about a range of parallel projects. For example, CSEC's partnership with Lancashire County Council in the development and monitoring of 'Pilot Sustainable Communities' in Burnley and Ecclestone, under the Government's 'Going For Green' programme, has profited from, and enriched, the study's findings about cultural networks and 'sustainability' discourses. The same was true of the four-day Citizen's Jury mounted by CSEC with Philosophy colleagues Alan Holland and John O'Neill, at Ely in early 1997 (referred to under Study C. above). And beyond these, CSEC's recent ESRC- and Unilever-funded work on current social tensions surrounding Genetically Modified foods is now being complemented by a Christendom Trust-funded project on the 'implicit-religious' commitments reflected in every-day talk about such foods - a project which has been found to build directly on the conceptual understandings of contemporary *engagement* and *commitment* clarified in the present study.
- The study's investigations have also nurtured continuing discussion within CSEC as a whole on the active 'constitution' of human subjectivity, flowing initially from internal seminar programmes on the use of particular survey methodologies (qualitative or quantitative) in social research contexts like that outlined in this

section. As explained at greater length in the Full Report, such discussions are helping to enrich CSEC's overall understanding of the unavoidably 'creative' role of the researcher in framing and arguably reifying particular dimensions of subjectivity, in particular ways, depending on the design and 'choreography' of the 'research' process relied upon. A developing collaboration with Lancaster's highly regarded Department of Theatre Studies is now providing an additional innovative context for exploration of such matters of performance, 'staging', and communication, for example through the medium of a planned jointly-organised 3-day international conference on 'Ecology, Politics, and Performance', at Lancaster in July 1999. Again, experience is suggesting that insights on such matters may have relevance for the emergence of new forms of 'deliberative' democratic public involvement in a more *culturally sensitive* politics of 'sustainable development'.

- Such dimensions of the project have also been encouraging reflection on tensions between contemporary 'secular' understandings of human subjectivity, and those embedded within long-established religious traditions of many kinds. We anticipate publishing on this issue too in the near future.

Selected Dissemination

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E. ENVIRONMENTAL RISK, KNOWLEDGE AND UNCERTAINTY

Approach, Findings, and Outputs

This 'project' was designed specifically to provide a reflective space for the integration of the principals' thinking about, and outputs from, the Phase 2 research programme as a whole. The activities involved *are elaborated and discussed at length in the Full Report*. They have generated a growing confidence in the robustness of the overall intellectual perspective to which Studies A-D, and the other surrounding CSEC studies over the same period, have been contributing.

Over and above the progress now being made towards publication of the suggested full theoretical implications of the programme (BW's book on *The Cultural Dimensions of Environmental Risk Discourses* is now well-advanced, RGW's on the new 'politics of knowledge' only a little less so), the significant developments have been:

- A range of articles, conference presentations, reports, and book chapters, reflecting on findings from the programme in relation to issues of the day - for example, Brent Spar, BSE, Genetic Modification, Climate Change Uncertainties (articles for *New Statesman*, *THES*, *Independent*, *Financial Times*, as well as *Political Quarterly*, *Social Studies of Science*, *Global Environmental Change*, et al);
- A growth in international exchanges between CSEC and other centres in the EU and North America - eg a joint Munich-CSEC comparative study of scientific risk cultures vis a vis the handling of BSE-CJD in the UK and Germany; growing interactions between BW, Cornell and Harvard on social science/environmental risk issues; RGW's involvement in the Tutzing (Germany) 'Time and Society' network; BW's ad hoc visiting roles at UBC (Canada), Aalborg (Denmark), and Barcelona (Spain); and European Science Foundation international networking (co-ordinated by Elizabeth Shove).
- Development of CSEC's post-graduate programmes, most immediately a full MA on 'Environment, Culture, and Society' from October 1998, resting on the perspective developed through the ESRC-funded research programmes since 1991; and
- Development of CSEC institutionally within Lancaster, including the pioneering of new forms of hybrid researcher-lecturer post to provide greater job security for established post-doctoral researchers. The Centre now has an increasingly central place in the evolution of Lancaster University's overall research strategy.

Two specific intellectual emphases in the principals' *environmental risk*-related work over the period merit particular emphasis. Both are now assuming ever-increasing policy world significance. The first is that of *framing* - the processes, tacit or explicit, whereby the substantive boundaries of 'issues' about to be subjected to technical (scientific, economic, social) assessment processes or evaluations become established normatively in particular situations. Recurrently during the two phases of the present six-year research programme, differences surrounding the issue of *framing* have been found to be of central significance in controversies between publics and regulators. The principals' conclusions and reflections on this issue have been fed into the landmark US National Research Council report, 'Understanding Risk' (1996), and into CSEC's specifically invited submission to the Royal Commission on Environmental Pollution, on 'Deliberative Institutions and Environmental Standards'

(1997). More recently still, they constituted a central topic presented by BW to the recent (1998) US National Science Foundation workshop on 'Global Environmental Assessment', at Harvard University.

A second issue is the emerging recognition of BW's formulations of *ignorance*, as a substantive issue for environmental and risk policy issues in the UK. The current CSEC-Munich cross-cultural collaborative study of UK and German handling of uncertainties in the BSE crisis is tending to confirm that inadequacies in the recognition of *ignorance* (i.e. beyond specifiable and explicit 'uncertainties') may be a culturally-induced weakness of dominant UK approaches to science-for-policy on risk issues, with serious potential (and historically speaking, *actual*) implications for policy commitments made by actors and advisory institutions 'blind' to such possibilities. This is a matter now also being explored further within the framework of an on-going new CSEC study, 'On Information and the Citizen', funded by Unilever.

Selected Dissemination

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Annex B

Summary of Main Research Results (1991-1994)

ANNEX B

SUMMARY OF MAIN RESEARCH RESULTS (1991-1994)

This multi-disciplinary programme has rested on intellectual interactions across the social sciences, natural sciences and humanities. It has involved extensive contact with policy world bodies such as the European Environment Agency, Lancashire and Cumbria County Councils, Greenpeace UK, World-Wide Fund for Nature, the Hadley Centre, the Forestry Commission, and the Department of the Environment.

The key results have flowed from the interpretation and testing of *over-arching* findings from the six discrete but interacting studies within the programme, specifically on Global Climate Modelling, EU Environmental Data Bases, Environmental Risk Perceptions, Green Consumerism, Environmental Valuation, and Religious/Philosophical Dimensions of Environmental Understanding. Summaries and particular findings from each of these individual studies - a number of direct relevance to current policy development - are set out in Annex A.

These six studies have led us to the *overall* finding that methodologies and policy approaches resting on the tacit assumption that 'environmental' issues and problems lend themselves to definition in exclusively physical 'natural' terms are misleading analytically, and are likely to prove increasingly ineffective in the circumstances of 'real world' policy initiatives. We have identified a recurrent tendency in dominant UK policy and media *environmental knowledge cultures* towards relatively uncritical reliance on reductionist scientific framings and representations of such problems, as providing the 'real' accounts of what is at stake. By contrast, we have established that, in reality, a range of human, social and institutional factors exert decisive determining influences on the shape and character of the prior underlying definitions and categories which govern formal knowledge in each domain. The particular commitments we have identified in currently dominant environmental knowledge cultures appear to be failing systematically to recognise and give weight to dimensions which we have found to be crucial in animating wider cultural responses and behaviours. This has important potential implications for the design and credibility of future official environmental policy endeavours, as well as for the more general understanding of 'environmental' concern as a social and cultural phenomenon of central contemporary significance.

The dominance in environmental policy (including many NGO) circles of an embedded scientifically 'realist' conception of environmental problems and issues is, we have found, giving rise to a number of tendencies, which may now be feeding trends in public alienation from official policy initiatives. These include:

- a tendency for *indeterminacies* inherent in the social and cultural underpinnings of environmental knowledge to be 'reduced' intellectually to forms of more deterministic, and hence supposedly in principle more 'soluble' or tractable, *uncertainty*;
- a tendency to conclude that, when problems arise with respect to the public authority of expert knowledge in particular environmental fields, such problems are due to *incompleteness* of public understanding, rather than to more

fundamental lack of public trust or confidence in how genuine indeterminacies are being addressed;

- a tendency towards methodological elaboration, rather than deeper reflection on the structural (in)adequacies of the intellectual tools in question; and
- a neglect of the significance of important human-relational realities which are integral to the generation and maintenance of credible authoritative knowledge for policy purposes - particularly a sense of personal *agency* in relation to such knowledge, and the role of authentic personal *trust* (or *mistrust*) in public institutions for the credibility of knowledge deployed by such institutions. We have found that such considerations are frequently misunderstood as public inability or unwillingness to assimilate expert knowledge - e.g. about risks.

These and other findings suggest the current dominance of an implicit environmental knowledge paradigm which embodies pervasive under-appreciation of the cultural underpinnings of environmental understanding. They are especially serious in the light of the mounting official recognition (e.g. in the EU's 5th Environmental Action Programme, Agenda 21, etc) of the need for widespread human-behavioural (ie '*cultural*') changes, if global/local environmental challenges are to be addressed effectively. Our research thus helps explain why, despite the impressive degree of commitment to policy advance at senior levels within the Department of the Environment and elsewhere within government and its agencies, there appears now to be widespread public scepticism towards official good faith in this area. We have begun to develop and publish on our own 'alternative' model of environmental knowledge and policy development, aimed at addressing some of these limitations. This builds, *inter alia*, on sociological and anthropological insights concerning the cultural grounding of modern science and its institutional framings, current 'crises' of modernity, and contemporary cultural processes of 'globalisation'. It highlights the mounting social, political, and epistemological significance in the environmental domain of 'human' issues such as *trust*, *the status of expert knowledge*, *indeterminacy*, *reciprocity*, and *agency*.

Our findings have been tested through continuing interactions with a number of public agencies, NGOs, and industrial actors, as well as with cognate research groups in the UK, EU, US, and Australasia. A range of ancillary reports, adapting particular findings to the concerns of such bodies as Lancashire County Council, the Cabinet Office, CPRE, the European Environment Agency and others, have reinforced confidence in their robustness. The parallel personal involvements of both of the principal researchers in senior executive/advisory roles for a range of such bodies nationally and internationally, and in several EU-US project networks on social science/ environment issues, have provided similar confirmation. A range of journal articles, book chapters, conference papers (in the UK and abroad), and other outputs have been published. Two books based on the programme will be published, by Sage and Routledge, in 1996, and further books are now planned. A number of our outputs have already attracted positive academic and policy world responses.

Recent visitors to Lancaster to discuss aspects of the programme include the Secretary of State for the Environment (on a private seminar visit), senior DOE officials, senior advisors and consultants to a range of public agencies and local authorities, and academic colleagues from many parts of the globe. We have also published joint articles with natural scientists, and have interacted with ESRC, NERC

and BBSRC on natural science/social science collaborations, an area in which we believe the programme has made especially significant advances, both practical and theoretical.

The programme has involved significant methodological developments, particularly in the use of qualitative focus group techniques for allowing actors' own categories of meaning (scientists, officials, industrialists, NGOs, public) to be identified. This and other methodological innovations have led to wider exchanges (workshops etc) with academic colleagues from other UK universities. With colleagues within the Centre for the Study of Environmental Change, we are also now offering MA teaching modules on 'Environment and Culture', based on our GEC-funded research approach. These are already proving successful with post-graduates from the natural sciences, social sciences and humanities.

We believe that, over and above the substantive findings to have emerged, the programme has laid the ground for a promising range of new relationships across the disciplines, and between theoretically informed social science and the environmental policy world.

Annex C

Rationale Section of RGW/BW's Original Research Centre Bid to ESRC, May 1990

ANNEX C

RATIONALE SECTION OF RGW/BW'S ORIGINAL RESEARCH CENTRE BID TO ESRC, MAY 1990

2.1 The Emerging Context

Environmental policy is an increasingly urgent concern of most governments. In the 1990s, they will be seeking to respond politically to such daunting problems as the greenhouse effect, ozone depletion, toxic waste accumulation, pollution of the atmosphere and oceans, and losses of natural species. Governments such as that of the UK are stressing the importance of 'sound science' and 'environmental economics' in their definitions of, and responses to, these problems.

Substantial intellectual and financial resources are now being committed by governments and international institutions like OECD, the United Nations, and the World Bank, to the development of economic tools aimed at inducing more environmentally desirable patterns of public and private consumption. Such expenditures will grow in the 1990s, as will natural scientific research on relevant patterns of cause and effect. These programmes will be increasingly multi-national. In this context, individual governments will have a growing need for advice on how to target most effectively their own scarce environmental research resources.

The pressure for co-ordinated international action on environmental problems will encourage the development of standard economic and scientific languages and instruments. However, such an emphasis will come at a time when grass-roots cultural nationalism is growing in East and West and the social authority of technical expertise is contested increasingly by the public in advanced industrialised countries.

2.2 Social and Political Tensions

Thus, social tensions over how environmental problems, and their supposed solutions, are to be framed, will sharpen rather than recede, as new technical methods for addressing these problems are advanced by governments. Existing research shows that public concerns usually described as 'environmental' may embody deep, through unarticulated mistrust of the assumptions of regulators, and anxiety about future social uncertainties.

Increasing globalisation of the world economy will be matched by the development of progressively more sophisticated public responses to environmental change, defined and channelled by increasingly well-resourced and integrated non-governmental organisations (environmental pressure groups). The latter will be catalysts of political concern in the 1990s, even more than they were in the 1980s. Thus the inherent indeterminacies, and implicitly social assumptions, in natural scientific and economic definitions of environmental problems will come under progressively more intense security.

In short, the recognition by governments of the central importance of environmental policy, and their anxiety in the 1990s to react constructively, is likely to bring to the surface well-grounded cultural tensions. These will challenge the social authority of the natural sciences and positivistic approaches within economics. Social re-negotiation of this authority looks certain to become unavoidable. However,

governments risk being confronted with this at precisely the time that they will be hoping for unambiguous modes of understanding which can be used to address the problems of international environmental change.

Hence reliance by governments on scientific and technical frameworks may well be inadequate to generate the desired political consensus. In such circumstances, the social dynamics of environmental concern, and their interactions with the natural sciences and economies, will assume growing significance. Governments in the 1990s will be looking to the research community for an understanding of the social dynamics of the new problems they will be facing.

2.3 The Role of the Social Sciences

There are two particularly important contributions the social sciences can make in relation to environmental change. The first focuses on the social processes which contribute to such change and on the development of instruments to help predict and mitigate the worst effects. But in the new circumstances of the 1990s described above, the social sciences will also have a second, more crucial, though less widely acknowledged role - that of clarifying the nature and limitations of society's methods of understanding and responding to, environmental change. This entails using social scientific insights to help the various 'instrumental' disciplines to interpret their own epistemologies more realistically.

Whilst many natural and social scientists recognise particular areas of uncertainty, much public policy is framed as if the natural sciences could, in principle, provide unambiguous and definitive descriptions of environmental processes. However, as a growing body of research in the sociology of science shows, the reality is that natural scientific modes of inquiry are themselves social processes, into which crucial assumptions, choices, conventions, and indeterminacies are - necessarily - built. Unless the full implications of these are understood and catered for in policy judgements, attempts to construct, realistic, socially robust environmental policies or new methodologies - like environmental economics - will fail. Indeed a body of existing research suggests that it has been the failure of governments and regulators to respond to such indeterminacies and their social implications, which has helped fuel repeated environmental controversies over the past two decades in fields such as nuclear power, toxic wastes, pesticides, and water quality. The cumulative effect of such controversies, and the social antagonisms they have perpetuated has been more confusion than ever about the social dynamics of environmental problems and their possible solutions. Despite years of such arguments, governments have emerged with little depth of understanding on which they can now draw with confidence.

It is in this area, in the interface between technical (scientific and economic) knowledge and wider social concerns on environmental questions that the social sciences face their most important challenge for the generation of new knowledge in the 1990s. They are needed to help illuminate the social underpinnings of the structures of society's environmental understanding, including the complex variety of social tensions which are masked by the apparently 'natural' idioms used to describe the environment and its associated changes. Alongside the social sciences, the humanities are also essential to enrich this process of understanding through historical and philosophical analysis, and by giving due weight to human cultural, religious and moral aspirations.

2.4 A New Research Approach

The intellectual challenges of environmental change, global and local, over the next two decades demand new forms of collaboration between natural, social and human scientists to stimulate urgently the process of social learning about the deeper structure of environmental knowledge, in the policy and intellectual communities. Unless scientific and technical knowledge can be reconciled more authentically with the social meanings of contemporary environmental concern, environmental policies will be unlikely to command social acceptance in modern societies.

Thus a sustained attempt is required of the research community to understand the basis of the social authority of its formal bodies of knowledge in the environmental sphere, whether in the natural or the social sciences. This means addressing not simply the question of whether or not particular disciplines produce true accounts in their own terms, but rather how these insights are framed, and how the conditions of their validity in scientific terms relate to the conditions of their proposed application in actual situations. For example, the toxicology of pesticides may reflect true and precise knowledge of controlled laboratory doses of pure chemicals to particular pure-bred strains of mice or rats but the crucial question for environmental policy is whether and how such knowledge is relevant to diverse and ill-defined real-life situations in which people are exposed to pesticides. Social as well as natural scientific inquiry is needed to understand issues of this kind. What is the basis of the authority of institutions (for example, certain ministerial advisory committees) which appear to operate as if the two forms of knowledge were identical? In such situations, which are legion in current environmental policy making and public debate what are the criteria by which particular policy knowledge achieves social authority?

In research terms, this requires as a catalyst an integrated programme of investigations focussing on pivotal problems. The issues chosen should be those in which the social authority of particular bodies of knowledge has already been identified as problematic. It is through investigation of a range of such current real-life problems that original insights will be drawn out of the various interacting disciplines. These approaches can then be consolidated, providing new purchase on the deeper structural issues, in a fashion relevant to the policy world.

Lancaster's style and balance of research skills are particularly well-suited to these new needs. The University already has substantial experience of relevant inter-disciplinary collaboration in relevant spheres. Moreover, key individuals who will play central roles in the proposed Centre have been significant contributors to the UK's (still fragmentary) existing research understanding of the problems, with Research Council backing. The proposed Centre's intention is thus to consolidate and advance insights and research methods already in embryo, across a wide front for the benefit of both theoretical understanding and actual political practise. The enterprise promises to have international significance in the 1990s quite as great as that which has flowed from the ESRC-backed pioneering work on environmental economics in the 1980s.