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**LINKAGES BETWEEN ECOCENTRIC VALUES AND ACTION IN
EXPERT DISCOURSE:
The Case of Genetically Modified Food in the UK**

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Doctor of Philosophy

THE UNIVERSITY OF ASTON IN BIRMINGHAM

SEPTEMBER 1999

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The University of Aston in Birmingham

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Summary of the Thesis

Attitudes towards the environment can be manifest in two broad categories, namely anthropocentric and ecocentric. The former regards nature as of value only insofar as it is useful to humanity, whereas the latter assigns intrinsic value to natural entities. Industrial society can be characterised as being dominated by anthropocentrism, which leads to the assumption that a majority of people hold anthropocentric values. However, research shows the most widely held values are ecocentric, which implies that many people's actions are at variance with their values. Furthermore, policy relating to environmental issues is predominantly anthropocentric, which implies it is failing to take account of the values of the majority. Research among experts involved in policy formulation has shown that their values, often ecocentric, are excluded from the policy process.

The genetic modification of food can be categorised as anthropocentric, which implies that the technique is in conflict with widely held ecocentric values. This thesis examines data collected from interviews with individuals who have an influence on the debate surrounding the introduction of genetically modified foods, and can be considered 'experts'. Each interviewee is categorised according to whether their values and actions are ecocentric or anthropocentric, and the linkages between the two and the arguments used to justify their positions are explored. Particular emphasis is placed on interviewees who have ecocentric values but act professionally in an anthropocentric way. Finally, common themes are drawn out, and the features the arguments used by the interviewees have in common are outlined.

Keywords: values, ecocentrism, genetic modification, expert, discourse

To Christiane

Acknowledgements

The writing of a PhD thesis is a long and solitary process, and the production of this volume has been no exception. However, there are a number of people without whom the task could not have been completed, or at least, without whom it would have been much more difficult than it turned out to be. To all of them I extend my grateful thanks.

At Aston, Steve Conway, Kirstie Ball and Tim Edwards, and further afield, Peter Simmonds, Julie Sheppard and Susan Casey provided inspiration, encouragement, and contributions to the ideas contained in this thesis. My supervisor, Fred Steward secured the funding for my studentship, and provided invaluable comments on drafts of the thesis. Pam Lewis tirelessly ensured all things administrative ran smoothly, and listened patiently to my woes when things weren't going well.

I am indebted to the 27 nameless individuals, who freely gave up time in their busy schedules to answer, what must have seemed at times, a series of bizarre questions.

My family, particularly my parents, Ann and Carel Quaife, and my late maternal grandparents, Vera and Leslie Freeland were unstinting in their help and support, both moral and financial. They never stopped believing, despite all evidence to the contrary that I could complete the project.

Finally, my partner, Christiane Bernigaud without whom I would not have started, much less finished this thesis. It is difficult to convey on paper how much she helped me through each day of what were a difficult five years, but suffice it to say that if I have emerged from this process with any semblance of sanity, it is thanks to her.

Contents

1. INTRODUCTION	10
2. ECOCENTRISM: AN ECOLOGICAL PARADIGM	13
2.1 Introduction	13
2.2 The Need for Environmental Thought	13
2.2.1 Environmental Destruction as Cultural paradigm	14
2.2.2 Environmental Destruction as Technical Problem	17
2.3 A Typology of Environmental Thought	18
2.4 Deep Ecology	21
2.4.1 Naess's Formal Sense of Deep Ecology	21
2.4.2 Naess's Philosophical Sense of Deep Ecology	24
2.4.3 Naess's Popular Sense of Deep Ecology	25
2.5 Problems with Deep Ecology	26
2.5.1 Terminology	27
2.5.2 The Accommodation of Un-Ecological Worldviews Within Deep Ecology	28
2.5.3 Abandoning Deep Ecology for Ecocentrism	30
2.6 Evidence of Support for Ecocentrism	32
2.6.1 Lay People	32
2.6.2 Experts	37
2.7 Co-existence of Ecocentrism and Anthropocentrism	40
2.7.1 Naess's Methodology and Conflictual Worldviews	41
2.7.2 Dilemmatic Thinking	43
2.7.3 Taking the Side of the Other	45
2.8 Conclusion to Chapter Two	46
3 ECOCENTRISM APPLIED TO GM FOOD	48
3.1 Introduction	48
3.2 Genetic Modification of Crops	48

3.3 GM Crops and Agricultural Trends	50
3.4 Ecocentric Theorists and GM Food and Crops	51
3.5 Genetic Modification and Reductionism	55
3.6 Conclusion to Chapter Three	58
4 METHODOLOGY	59
4.1 Introduction	59
4.2 Qualitative versus Quantitative Data	59
4.3 The Use of Grounded Theory	63
4.4 The Neutral Researcher	65
4.5 Selection of Interviewees	68
4.6 The Interviewees	73
4.7 Interview Protocol	74
4.8 Data Reduction	78
4.9 Data Analysis	80
5 NON-CONFLICTUAL INTERVIEWEES	82
5.1 Introduction	82
5.2 A Typology of Interviewees	82
5.3 The Interviewees	84
5.4 Unplaced Interviewees	86
5.4.1 Professional Reticence	86
5.4.2 Values as an Unfamiliar Issue	88
5.4.3 Values as an Uncomfortable Issue	89
5.4.4 Values and Gender	90
5.5 Ecocentric Interviewees	90
5.5.1 Case Study: John	90

5.5.2 Case Study: Anne	95
5.5.3 Case Study: Robert	97
5.5.4 Case Study: Mark	100
5.5.5 Case Study: Carol	105
5.5.6 Case Study: Mike	110
5.5.7 Summary of Eco-centric Respondents	113
5.6 Anthropocentric Respondents	115
5.6.1 Case Study: Andrew	115
5.6.2 Case Study: Henry	121
5.6.3 Case Study: Paul	126
5.6.4 Case Study: Mary	131
5.6.5 Summary of Anthropocentric Respondents	137
5.7 Conclusion to Chapter Five	138
6 CONFLICTUAL RESPONDENTS	139
6.1 Introduction	139
6.2 Scientists	139
6.2.1 Case Study: Eric	140
6.2.2 Case Study: Alan	145
6.2.3 Case Study: Simon	152
6.2.4 Other Scientists	158
6.3 Food Industry Representatives	158
6.3.1 Case Study: Jim	158
6.3.2 Case Study: Marie	165
6.3.3 Case Study: Sally	169
6.4 Representatives from the Biotechnology Industry	173
6.4.1 Case Study: Chris	173
6.5 Representatives from NGOs	182
6.5.1 Case Study: Janice	182
6.5.2 Case Study: Sue	184
6.5.3 Other NGO Representatives	191
6.6 Civil Servants	192
6.6.1 Case Study: Graham	192

6.7 Conclusion to Chapter Six	199
7 THEME BASED ANALYSIS	200
7.1 Introduction	200
7.2 Food Security Arguments	200
7.2.1 The Green Revolution	204
7.3 Notions of Progress	205
7.4 Expert Legitimacy	207
7.5 Economic and Trade-Related Arguments	209
7.6 Amorality of Science	212
7.7 Dismissal of Emotional Arguments	213
7.8 Conclusion to Chapter Seven	216
8 CONCLUSION	219
8.1 Summary	219
8.2 Limitations of the Research	226
8.3 Uses for the Thesis	227
8.4 Prospects for Future Work	229
9 REFERENCES	232

Tables and Figures

1 TABLES

4.1 Sampling Techniques	69
5.1 Interviewees by Profession	85
5.2 Interviewees by Category	86

2 FIGURES

2.1 A Typology of Environmentalism	19
2.2 Public Environmentalism (1)	35
2.3 Public Environmentalism (2)	36
2.4 Matrix of Environmentalism	41
5.1 Categories of Interviewee	83

Chapter One: Introduction.

According to Craig, Glasser and Kempton, expert discourse on environmental policy is characterised by the use of '*objective*' language emphasizing empirical data and utilitarian aims in contrast to the wider public who use heart-felt, wider identifying, and ostensibly '*subjective*' language that often reveals a belief in the intrinsic value of the environment¹. Writing about UK risk assessment in relation to genetically modified food, Grove-White *et al* make the similar point that government emphasis on *sound science* has excluded other more substantive considerations.²

According to Kempton, Boster and Hartley, there exists (at least in the US) a set of environmental values widely held by the public, which include an acceptance of the intrinsic value of nature, and a rejection that its value resides solely in the benefits it bestows on humans.³

This implies that expert discourse on environmental policy fails to reflect an important component of public thinking on environmental issues. This can, and indeed has been interpreted as being a symptom of the need for increased education of the public in order that they might conceptualise environmental issues in the same terms as 'experts' use in their formal discourse. However, Craig *et al*'s paper cited above reveals that their sample of EC environmental policy advisors often shared the values uncovered in the public by Kempton *et al*. Here then we see an alternative interpretation of the mismatch between expert and lay discourse, that the experts are somehow constrained in what they are able to say in a professional context, with the result that neither group appears to be in agreement with the utilitarian nature of EC environmental policy.

The field of environmental philosophy allows the consensus on environmental values identified above to be extrapolated into orientations towards human/environment interactions. Naess suggests a formalised methodology

¹ Craig, Glasser and Kempton 1993 p. 137

² Grove-White *et al* 1997 p. 25

³ Kempton, Boster and Hartley 1995 p.p. 202-203

whereby fundamental values can be used to derive behavioural norms by the construction from a values basis of a coherent worldview.⁴ Despite a number of problems with this idealised view of actual and potential human thinking, it remains a useful conceptual tool for resolving action dilemmas by grounding solutions in fundamental values. For example, Naess's methods, particularly as developed by other authors, most notably Fox⁵, suggest that the currently emerging application of genetic modification⁶ to food is in conflict with the consensus on environmental values, which is mirrored by the environmental movement's almost universal opposition to genetic modification in food..

This thesis aims to examine the way in which experts involved in the debate surrounding genetically modified food link their values to their professional work, and whether those values agree with Kempton *et al*'s insight into the nature of the values of the public. Implicit here is the notion that those experts professionally in favour of genetically modified food are either acting in a way which conflicts with their values, or that they hold values which are different from the general public. This gives a particular emphasis in the thesis on experts who appear to acting in conflict with their values, but the broader purpose is to examine the linkage between values and action by exploring how these experts justify their professional behaviour. This examination is undertaken with reference to 27 long, unstructured interviews which were undertaken with a range of individuals with influence in the debate surrounding genetically modified food, and who can be considered 'experts'. The sample of experts include not only those who appear to be promoting genetically modified food, but also those who are fighting against it, and those who seem ambivalent.

Chapter Two examines ways in which environmental thought can be categorised, and introduces the notion of ecocentrism; the belief that the environment has intrinsic value. It then explores how ecocentric values can be linked to everyday

⁴ Naess and Rothenburg 1989 p.p. 41-44

⁵ Fox 1995 p.p. 138-139

⁶ The favoured term for this technique has changed over time. Genetic manipulation was replaced by genetic engineering, which in turn was replaced by genetic modification. Modern biotechnology is now gaining favour as an appropriate term. Each change has come about as the previously favoured term has acquired a negative public image. This thesis uses Genetic Modification throughout, except in citations where the original wording is preserved.

behaviour, and considers the evidence for sympathy among the general public and experts for such values.

Chapter Three applies the insights of Chapter Two to genetically modified food, concluding that it is incompatible with ecocentric values.

Chapter Four looks at the methodological aspects of the project, giving particular attention to the problems of uncovering ecocentric values, a problem which is exacerbated by the politically sensitive nature of the issues, and the professional context of the interviews themselves.

Chapter Five introduces a broad categorisation of respondents, and examines those interviewees whose environmental values were not uncovered, and those whose professional action seems to be in broad agreement with their values, ecocentric or otherwise.

Chapter Six consists almost entirely of vignettes describing interviewees whose values appeared to conflict with their professional work, and is broken down by professional position.

Chapter Seven examines the themes which emerged from the preceding two chapters, which illuminates the common ground between interviewees, and points toward generalisable conclusions which can be drawn from the study. It includes considerations of the limitations of the work undertaken, the uses to which it could be put, and the prospects for further work.

The thesis includes extensive excerpts from transcribed interviews. Every effort has been made to ensure the accuracy of the transcripts, and they include hesitations, false starts and non-standard syntax, all of which help to paint a more accurate picture of the discourse they are attempting to represent. However, no attempt has been made to include speech overlaps, intonation and pause lengths. Amendments to the excerpts have been made by the author, which may be to preserve anonymity, to delete potentially libellous references to companies and individuals and to improve clarity of meaning. All such amendments are contained within square brackets. Where sections have been deleted for brevity, the following appears: [...].

Chapter Two: Ecocentrism: An Ecological Paradigm.

Nature is man's *inorganic* body - nature, that is, in so far as it is not itself the human body. Man *lives* on nature - means that nature is his *body*, with which he must remain in continuous interchange if he is not to die. That man's physical and spiritual life is linked to nature means simply that nature is linked to itself, for man is a part of nature.

*Karl Marx*¹

2.1 Introduction

This chapter examines ecocentrism, and locates it within the broader spectrum of environmental thought. Ecocentrism is then examined as a practical philosophy of living by linking values to actions, and the evidence of public and expert sympathy for the position is assessed. The existence of ecocentric values is contrasted with the relative absence of ecocentric discourse or action, and theoretical perspectives on this apparent contradiction are examined.

2.2 The Need for Environmental Thought

In contemporary global culture, environmental thought has arisen primarily out of an awareness of the changes caused in the non-human world by industrialism. Such changes are not only a recent phenomenon: the ancient Greeks deforested their land in order to build ships, creating the barren, dry landscape which remains in that area today. Excessive crop irrigation in Mesopotamia led to salinisation of the land, decimation of food supplies, and hence the demise of that civilisation. Ironically, the very technique which brought about the salinisation had initially made previously barren land fertile. Carbon deposits deep in arctic ice show periods of air pollution caused by pre-modern industrial activity. However, it is only in recent history that these activities have produced such

¹ Marx 1970 p. 112

intense effects, and become so spatially diffuse that nowhere on Earth is free from the influence of human industrial activity.

A description of current environmental problems seems rather superfluous; that they exist and are of critical importance is no longer seriously denied, and all forms of media now contain detailed descriptions of current knowledge of what those problems are.²

2.2.1 Environmental Destruction as Cultural Paradigm

Environmentally harmful activity by humanity appears to be self-destructive and thus nonsensical, given that human beings ultimately rely on the non-human world for the provision of sustenance, a tolerable climate, air, and many would argue, spiritual survival. Dismissing such activity as *human nature* as many contemporary commentators do is clearly untenable, given the existence of other cultures (now largely destroyed) who show no such tendency. It can be argued therefore that it is primarily a cultural phenomenon, rather than a spontaneous flowering of human (dis) ingenuity. The illusion of “human nature” created by cultural norms is in part due to the increasingly global nature of culture. Not only is the culture of Western Europe and North America being exported to all parts of the world, the ideological hegemony of this culture devalues all alternatives. Thus all those who do not conform to the ‘natural’ behaviour of the dominant culture can be dismissed as freaks, deemed to be awaiting ‘development’, or ignored completely.

Global culture has its origins in Christian Europe. Christianity makes explicit humanity’s relationship with nature:

Then God said, “Let us make man in our image and likeness to rule the fish in the sea, the birds of heaven, the cattle, all wild animals on earth, and all reptiles that crawl upon the earth.” So God created man in his own image; in the image of God he created him; male and female he created them. God blessed them, and said to and said to them, “Be fruitful and increase, fill the earth and subdue it, rule over the fish in the sea, the birds of heaven, and every living thing that moves upon the earth. God also said. “I give you all plants that bear seed

² See for example Lester Brown’s annual *State of the World* reports.

everywhere on earth, and every tree bearing fruit which yields seed: they shall be yours for food.³

Although the Bible is often contradictory and thus can be used to justify conflicting positions⁴, the account in Genesis of the Creation, while hardly uncontroversial, is accepted as the Christian doctrine⁵. In this passage, the relationship between humanity and the non-human world on which industrialism is based is clearly set out. Human Beings are explicitly superior to all other forms of life, made as they are in God's image, and the non-human world is described as a commodity to be used and manipulated as humanity sees fit. Here then, humanity is extracted from nature, allowing damage to nature without damage to self. Thus the rationale behind the apparently self-destructive nature of industrialism is revealed.

Providing a contrasting text illustrating a non-separatist relationship with nature is problematic because such cultures tend to record their histories orally rather than in writing, and in any case have now largely disappeared. The authenticity of the writings of contemporary representatives of vernacular cultures is open to doubt after generations of exposure to and assimilation into mainstream culture. Perhaps the most well known text is the speech given by Chief Seattle in 1854 when ceding his land to European settlers.⁶ Unlike the Genesis text, the speech is too long to reproduce here; the following are fragments of the original 1887 Smith translation:

Every part of the earth is sacred... All things are interconnected. What happens to the earth happens to the sons and daughters of the earth... Man did not weave the web of life, he is merely a strand in it. Whatever he does to the web, he

³ Genesis, Chapter 1, verses 26 - 30 (The New English Bible, Oxford/Cambridge University Press, 1970)

⁴ See for example current disputes regarding the moral acceptability of homosexuality

⁵ For an authoritative overview of anthropocentric biblical interpretation, and the marginalisation of other interpretations, see White 1967. For more ecocentric interpretations, see Naess & Rothenburg 1989 pp 183-189 and Gore 1992 pp 242-248. Kempton, Boster & Hartley contend that Christian based values are used by the (US) public to justify ecocentric beliefs (Kempton, Boster & Hartley 1995 p. 115)

⁶ Seattle made the speech in his native *Lushotseed* language, which was translated over a period of some 30 years by a physician, Henry Smith, and first appeared in the *Seattle Sunday Star* in 1887. It was revived during the emergence of the environmental movement in the 1960s, when the ornate, Victorian style of the Smith translation was edited, perhaps to be more appealing to contemporary audiences, perhaps to be more faithful to the style of the original speech. Further changes were made for film scripts and books, which by the 1990s had created doubts as to the material's authenticity. However, the very haziness of the speech's history which has undermined its credibility, together with its mass popularity, successfully mimic the oral tradition of the culture it purports to represent. See Rothenburg 1996.

does to himself... Where is the thicket? Gone. Where is the eagle? Gone.
What is it to say goodbye to the swift pony and the hunt? *The end of living and
the beginning of survival.*⁷

The contrast between this and the Genesis passage illustrates a fundamental difference in the perception of nature and humanity's place in it. Seattle does not set humanity apart from the non-human world, and the license to dominate and commodify in Genesis is replaced by a powerful notion of interconnectedness and mutual dependence.

The difference between the two passages also illustrates different attitudes to time and to "progress". The Judeo-Christian project of domination of nature is one that has progressed over time, and thus presents a linear conception of history. The distant past is different to the present, and the two can be connected together by a linear sequence of events. In contrast, the Native American model emphasises humanity's place in a complex web of nature. There is no project of increasing domination with which to mark the passing of linear time, rather a circular process dominated by natural cycles; the seasons, birth and death, which is often bolstered by beliefs in re-incarnation. Within this worldview, notions of progress and of history are meaningless, and technological development, with its resulting environmental damage could not have occurred. It is more than coincidence that Native American cultures have been a powerful influence on the environmental movement.

Similarly, Dickens contrasts the worldview of one of the few remaining isolated cultures, the Kogi of Colombia with that of modern society. Among various differences, he highlights the Kogi's conception of the unity of nature; they do not use non-human nature as a distinct category. In contrast, modern society views non-human nature as distinct from society.⁸

This section does not purport to be a comprehensive cultural analysis of the roots of environmental destruction in the industrial world, nor does it give more than a superficial picture of the diverse cultures existing in pre-US North America, although according to Capra, ecocentrism existed throughout Native American culture⁹. It seeks only to demonstrate that the current industrial trajectory is not

⁷ Rothenburg 1996

⁸ Dickens 1996 p.p. 1-6

⁹ Capra 1983 p. 459

inevitable; it is culturally rooted, and an ecocentric model is possible¹⁰. Furthermore, Francis of Assisi, Spinoza, Heidegger and Heraclitus all expounded similar philosophies, while Taoism is just one example of a closely related spiritual and philosophical framework.¹¹ More recently, at the root of the environmental movement; Rachel Carson in 1962¹², Leopold in 1949¹³, and a multitude of subsequent writers expounded ecocentric ideas.

2.2.2 Environmental Destruction as a Technical Problem.

Environmental concern is often not manifest in terms as dramatic as a questioning of the underlying cultural paradigm. With this paradigm intact, the problem must be framed as an imperfection in the current state of affairs. Thus a proliferation of fuel-inefficient cars can be seen as an economic failure to internalise all costs, or damage to the ozone layer through CFC use can be interpreted as an unforeseeable technical problem, to be solved by a new, improved technology. In this way the exploitative nature of the relationship between the human and the non-human world is not brought into question, and environmental damage is conceptualised as a series of minor technical issues.

¹⁰ See for example Bruchac 1994

¹¹ Capra 1983 pp. 458-459

¹² Carson 1991 pp.240-257

¹³ Sand County Almanac, cited in Dobson 1991 p.50

2.3 A Typology of Environmental Thought.

The previous section introduced two ways of conceptualising environmental problems; as an inevitable result of a cultural paradigm, or as a stimulus to devise technical solutions to specific problems within the current cultural paradigm. This section aims to frame that division in terms of humanity's relationship with nature.

Ecocentrism is the belief that nature has intrinsic value, regardless of any utility it might have for humanity. Although much has been written about how this might impact on human society¹⁴, such exercises are not relevant here: I wish only to introduce the concept of ecocentrism in this chapter, and apply it to genetic modification in the third.

The most obvious term for the opposing belief is technocentrism: a belief that a solution for environmental problems lies in the realm of technology. A technocentrist might believe, for example, that a solution to air pollution lies in cleaner car engines and a move to solar power.

An alternative framing of this position is anthropocentrism. This represents the belief that nature exists for the benefit of humanity, as illustrated by the Genesis quotation above. Thus horses might be considered valuable for their utility, pandas valuable for their aesthetic qualities and wheat valuable for the nutrition it can provide. Conversely mosquitoes might be considered to have no value, or even a negative value.¹⁵

¹⁴ See for example Dobson 1991, Capra & Spretnak 1985, Wall 1990.

¹⁵ Goldsmith recounts an instructive example of the utility to humans of mosquitoes owing to their part in a local ecosystem which allows the presence of trout and salmon. (Goldsmith 1992 p. 30) This type of argument could conceivably be extrapolated to show human utility for all living entities.

Tim O’Riordan’s 1981 framework¹⁶, has become a widely accepted schematic of variations on environmentalism despite the lack of consensus on terminology (he prefers technocentrism in opposition to ecocentrism, rather than my preferred anthropocentrism for example).¹⁷

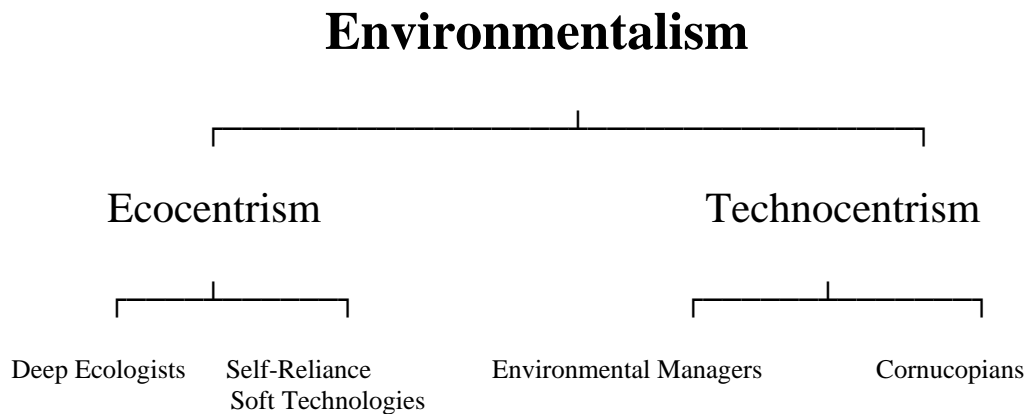


FIGURE 2.1

O’Riordan introduces subdivisions into both broad categories. Within the technocentrist camp, the Cornucopians are not convinced of an impending environmental catastrophe, which, coupled with their faith in technology to save humanity should such a disaster unfold leads them to a “wait and see” policy with “business as usual”. The environmental managers accept the irreversibility of much environmental damage, and the time lag between action, both destructive and constructive taking effect. However, they share the Cornucopians’ technological optimism, so their solution is the pre-emptive application of technology to adjust the path of industrial development. As anthropocentrists, this solution becomes a management problem. Nature, the scarce resource must be managed to ensure maximum (human) utility. This group’s slogan is *Sustainable Development*, a term first used in the Brundtland Report of 1987 and is *a process of change which can satisfy the needs of the present generation without compromising the ability of future generations to meet their needs*¹⁸. The

¹⁶ Cited in Naess & Rothenberg 1989, p.16

¹⁷ O’Riordan is by no means the only theorist to divide environmental thought in this way. Catton (1979) distinguishes between the *New Environmental Paradigm* and the *Dominant Social Paradigm*, whereas Cotgrove (1982) refers to *Environmental* and *Traditional* paradigms (Macnaghten & Urry 1998 pp 86-87). Naess uses *Deep* and *Shallow* ecology (see below).

¹⁸ De La Court 1990, p.19

term has an air of impervious logic, which belies an ambiguity in use, which some commentators contend render it useless as a practical model for change.¹⁹

Within ecocentrism, both variants accept the need for a paradigm shift. Deep Ecology, which is explored in detail below, is a philosophical approach to living, emphasising the interconnectedness of humanity and nature. It provides no blueprint for living, rather a set of techniques for deriving a set of norms appropriate to the circumstances. The other group (for whom O’Riordan provides no label) advocate radical decentralisation, self reliance, and a renunciation of materialism. Again, no blueprint exists for this group, and indeed an equivalent to the whole spectrum of conventional political opinion is represented in microcosm.²⁰

Other categorisations of environmental thought have been suggested; Stern and Dietz suggest egoistic (concern for self), social altruistic (concern for other humans) and biospheric (concern for nature in a broader sense) value orientations.²¹ However, for our purposes, the anthropocentric nature of both the egoistic and social altruistic categories make a distinction between the two unnecessary. Kempton *et al* also suggest three divisions; religious, anthropocentric and biocentric,²² but for our purposes, their religious category can be included in both the anthropocentric and biospheric categories, depending on the arguments and interpretations used (see above).

¹⁹ e.g. Pezzey 1992, Gowdy 1994, Parker 1993, Redclift 1993

²⁰ See for example Heider 1994

²¹ Stern *et al* 1994 p.p. 69-71

²² Kempton, Boster and Hartley 1995 p.p. 114-115

2.4 Deep Ecology

Within the comparatively new field of ecophilosophy, the work of Norwegian philosopher Arne Naess and his notion of deep ecology is central. It dates from his (largely ignored at the time) 1973 paper *The Shallow and the Deep, Long Range Ecology Movements* published in the relatively unknown journal *Inquiry*. Despite languishing in obscurity until around 1980, and the existence of at least two earlier and more widely read publications on similar lines (Leo Marx writing in *Science* in 1970, and Theodore Roszak's important 1972 book *Where the Wasteland Ends*²³), it is this paper, and subsequent development of the concepts and terminology it contains which continue to dominate ecophilosophy.

Naess's written output has been prodigious, in various languages, and often unpublished. The following analysis is largely based on Warwick Fox's *Toward a Transpersonal Ecology*, which draws on personal correspondence and meetings with Naess, together with unpublished papers not generally available. It achieves a balance and depth of coverage which is difficult with reference directly to Naess's published English language work.

2.4.1 Naess's Formal Sense of Deep Ecology

The term *deep* refers to a process of probing human/ecological relationships by asking strings of *Why* questions. Each question leads to a greater depth, until a set of fundamental assumptions are reached, at which point further *Why* questions cannot be answered. Similarly, deeper levels can be used to derive shallower ones in a reversal of the process. Thus for Naess, Deep Ecology refers not to a specific set of beliefs, but to a coherent mindset, where everyday activity is explicitly linked to a series of fundamental beliefs. Theoretically therefore, environmentally destructive behaviour can also be Deep Ecology if a connection exists between it and a set of fundamental values. However, Naess contends that a lifestyle connected to fundamental values will *always* be an environmentally benign one. Problems with this contention will be examined later.

²³ Fox 1995 p56

Naess divides questions into four levels, which in order of depth are everyday, technical, scientific and philosophical. His method of presenting an ecophilosophical structure is by the use of normative statements, followed by exclamation marks, and hypotheses which are used to derive the next normative statement. Fox gives the following simple example of such a structure:²⁴

Level One	N1	God! (i.e. Love/Value God!)
	H1	God is identical with the universe (i.e. God is Nature)
	N2	Nature! (i.e. Love/Value Nature!)
Level Two	H2	To truly love or value something is to love or value it for its own sake/in its own right rather than because of its use value to oneself.
	N3	Value Nature (including humans) for its own sake/in its own right!
	H3	If we value something for its own sake/in its own right, then we seek to allow it to unfold in its own way.
	N4	Preserve Nature!
	H4	If we wish to preserve nature then it is necessary to preserve the richness and diversity of life forms (including human cultures).
	N5	Preserve richness and diversity of life forms (including human cultures)!
	H5	Preserving richness and diversity of non-human life forms means minimising those forms of human interference in Nature that go beyond what is necessary for the satisfaction of significant human needs.
	N6	Minimise non-essential human interference in the non-human world!
	H6	The preservation of richness and diversity of non-human life forms requires a substantial decrease in human population.
	H7	The preservation of richness and diversity of human cultures is compatible with a substantial decrease in human population by means of the widespread application of birth control methods.
H8	The preservation of richness and diversity of human cultures is not compatible with a considerable decrease in human population by means of war, pestilence, famine, and so on.	
N7	Substantial human population reduction by means of the widespread application of birth control methods!	

Level one clearly deals with the realms of philosophy and religion. Fox defines level two formulations to be *the most general views that are considered to be*

²⁴ Fox 1995 pp. 99-101

common to supporters of the deep ecology movement. Notable here is the embrace of technology in the form of birth control. Practical Deep Ecology is not, therefore, an advocacy of a return to a mythological pre-technological golden age. Level three would include hypotheses concerning general lifestyles deriving from level two norms including food, housing, transport etc., and may result, perhaps via intermediate hypotheses and norms, in normative statements such as *Organic Farming!*, *More Cycling!* etc. Level Four is concerned with everyday decisions, and could result in normative statements such as *Recycle this piece of paper!* or *Participate in the anti-roads protest tomorrow!*

Variability, particularly in the derivation of level four norms is an important aspect of Naess's formulation. It allows the tailoring of decisions to spatial and cultural location, and to individual or group preferences. Technology can be accepted or rejected as deemed appropriate: Fox's example above posits the use of birth control, but were it developed, it might reject the use of the private car. A grouping might decide that train travel was acceptable, if power was from clean sources, while another might decide to organise themselves such that regular travel was not necessary. Amish communities in the US are an instructive example of highly selective use of technology, which they evaluate carefully for its impact on their lifestyle before adopting or rejecting it. While this pattern is common to all Amish communities, each draws the technological line at a different place, according to the results of their own deliberations,²⁵ which has clear parallels with the variability of expression Naess expects from communities following deep ecology. Variability also allows an evolution of lifestyles to reflect new knowledge or changing preferences.

²⁵ Daniel 1993 p. 53

2.4.2 Naess's Philosophical Sense of Deep Ecology

This represents Naess's own formulation of norms and hypotheses: *Ecosophy T*.²⁶ His fundamental norm (N1 using his own notation) is Self-realisation; clearly, an exploration of its meaning is necessary.

From an early age, Naess's thought has been profoundly influenced by Spinoza, and later by Gandhi; Naess's deductive approach to ecophilosophy mirrors Spinoza's own. A key concept in Spinoza's work is *conatus*, which refers to the motivation considered to be fundamental to all things, the attempt to continue in their own being. This, on a trivial level can be, and often is, interpreted to mean nothing more than preservation of self in an atomistic sense, and as such is typically translated into English as 'self preservation'. However, Spinoza was concerned with a much broader sense of self, in which the individual is situated within, and thus indivisible from the whole, the whole being termed God, nature, Gaia, the ecosystem etc. This expanded sense of self is a logical derivation of the impossibility of the continued existence of any being without the continued existence of the system of which it is part. Armed with this expanded sense of self, damage to God/nature can be interpreted as damage to self,²⁷ with consequences for the action of the individual as powerful as the threat of damage to the atomistic self. Thus Naess's *Self-realisation* is the development of this expanded sense of self.

While the concept of Self-realisation may have originated with Spinoza, the term, and for Naess, its incorporation into a practical philosophy of living is Gandhian. During his life, Gandhi was explicit that the purpose of his work with the poor, and for Indian independence was his own self-realisation. The apparent paradox of altruism in the name of selfishness is resolved by the expanded sense of self. For Gandhi, his identification with the poor with whom he worked, through self-realisation was such, that their needs became his needs and thus altruism and selfishness became the same. It is largely through the work of Gandhi that Naess was able to develop his formulation of *Ecosophy T*.²⁸

²⁶ Naess prefers this term to the more usual ecophilosophy. The difference between the two is not important here.

²⁷ Naess & Rothenberg 1989, p.85

²⁸ Fox 1995 pp 103-104

N1	Self-realisation!
H1	The higher the Self-realisation attained by anyone, the broader and deeper the identification with others.
H2	The higher the Self-realisation attained by anyone, the more its further increase depends upon the Self-realisation of others.
H3	Complete Self-realisation of anyone depends on that of all.
N2	Self-realisation for all living beings!
H4	Diversity of life increases Self-realisation potentials.
N3	Diversity of life!
H5	Complexity of life increases Self-realisation potentials.
N4	Complexity!
H5	Life resources of the Earth are limited.
H6	Symbiosis maximises Self-realisation potentials under conditions of limited resources.
N5	Symbiosis!

Naess then develops Ecosophy T to include level three normative statements such as ‘Local self-sufficiency and co-operation!’, ‘Local autonomy!’, ‘No centralisation!’, ‘All have equal rights to Self-realisation!’ etc.

2.4.3 Naess’s Popular Sense of Deep Ecology

It is through his popular sense of deep ecology that Naess has communicated a set of practical guidelines derived from his formal and philosophical position. Sympathy with these guidelines can be considered to define the deep ecology movement, although Naess emphasises the plurality of religious and philosophical beliefs which can lead to such an end point.²⁹ He details eight ‘basics’ of deep ecology:

²⁹ This list appears in slightly modified forms in much of Naess’s writing, e.g. Naess 1990 p. 135, Naess & Rothenburg 1989 p.29.

1. The well-being and flourishing of human and non-human life on earth have intrinsic value. These values are independent of the usefulness of the non-human world for human purposes.
2. Richness and diversity of life-forms contribute to a realisation of these values and are also values in themselves.
3. Humans have no right to reduce this richness and diversity except to satisfy vital needs.
4. The flourishing of human life and culture is compatible with a substantial decrease of the human population. The flourishing of non-human life requires such a decrease.
5. Present human interference with the non-human world is excessive and the situation is rapidly worsening.
6. Policies must therefore be changed. These policies will affect our basic economic, technological and ideological structures.
7. The change in our attitudes will bring an appreciation of the quality of life, rather than adhering to an increasingly higher standard of living. There will be a profound awareness of the difference between big and great.
8. Those who subscribe to the foregoing points have an obligation directly or indirectly to try to implement necessary changes.

Thus for Naess, a deep ecologist can come from a number of different starting points, and have very different ways of living, (i.e. diversity at levels one and four), but must conform at an intermediate point (primarily level two, but also to a lesser extent, level three). This convergence at level two arises from his insistence that using his deductive method, all fundamental values lead to ecocentrism, and his acknowledgement that the practice of such beliefs will vary with culture, geography and preference.

2.5 Problems with Deep Ecology

The widespread acceptance of Naess's terminology and the influence of his work has not precluded criticism of his position. In this section, I will not consider critics arguing from a non-ecocentric standpoint, which tend to be based on the suitability of deep ecology as a practical model for change in the current cultural environment, or on dismissals by mainstream commentators based on misunderstandings³⁰.

Dickens' criticisms of deep ecology are perhaps more worthy of consideration. Firstly he berates the lack of a blueprint for what the proposed new society will look like.³¹ However, deep ecology does not set out to provide a recipe for a new

³⁰ e.g. Taylor 1992 p. 13

³¹ Dickens 1996 p. 39

society, indeed it celebrates the diverse forms that communities within such a society could take. Instead, it presents a methodology for deriving societal models, the outcome of which depends upon the starting point, and which of a infinite number of possible routes, are taken subsequently. Secondly, he reproduces a quote from Naess, which he considers illustrates that deep ecologists *assume that principles for human society can be drawn from ecological science and, by extension, from the laws of physics.*³² Here Dickens has reversed the point that Naess is making, and thus also misrepresented Deep Ecology. Naess appeals for ecologists to move beyond the narrow confines of their discipline to consider values and ethics. Dickens mistakenly interprets this to mean that those values and ethics should be *derived* from ecology, and thus science in general. These two initial errors are then extrapolated to present further erroneous arguments.

2.5.1 Terminology

As previously mentioned, I do not favour the use of the term ‘deep ecology’, favouring instead ‘ecocentrism’. This stems in part from a practical oversight on Naess’s part which will be explored in the next section, but also from the unwanted connotations of the word ‘deep’. According to Suttle,³³ it is misleading, since it implies some kind of deep water botany. More fundamentally, ecology is by definition ‘deep’ in that it explores the interrelationships in nature and thus its complexity, so in a sense, the term is redundant. Finally, according to respected deep ecological theorists Devall and Sessions³⁴ it creates the unintentionally pejorative term ‘shallow ecologists’ for the anthropocentrists/technocentrists, but the use of other terminology for this group abandons the symmetry of the deep/shallow labels.

The arguments among deep ecologist writers have led to the suggestion of various alternative terminologies, none of which have been agreed upon, and all of which have problems of their own. Naess himself has been drawn into these

³² Dickens 1996 p. 38

³³ Cited in Fox 1995 pp. 119-120

³⁴ Cited in Fox 1995 p.121

arguments, and has adopted a set of conventions for using his terminology which attempt (rather clumsily) to avoid some of the problems outlined. Perhaps one of the most convincing alternatives is Fox's suggestion of 'Transpersonal Ecology', (the prefix trans meaning beyond rather than across), but the term has not gained popularity.

2.5.2 The Accommodation of Un-Ecological Views Within Deep Ecology.

It is arguable that deep ecology contains an inherent contradiction in that Naess admits that unecological views could theoretically be derived from his methods. He side-steps this problem by claiming that such a contradiction is theoretical only, since no such position can, in reality be derived. He tempts fate somewhat by appealing to fellow-philosophers to prove him wrong,³⁵ which inevitably they have now done. Fox cites a 1984 paper published in 'Environmental Ethics'³⁶, in which the author, who is thoroughly immersed in Jewish culture, describes how his anthropocentric and nature-hostile worldview is logically derived from Judaism. The theological similarities between Judaism and Christianity create a link to Fox's own refutation of Naess's assumption, using the anthropocentric interpretation of Genesis previously discussed, and the fundamental norm (N1) 'Obey God!³⁷. However, more interestingly, Fox gives a second example:³⁸

- | | |
|----|---|
| N1 | Evolution! |
| H1 | The process of evolution has a tendency to generate increasingly complex living systems. |
| H2 | The tendency referred to in H1 is not accidental, but represents a directionality that is inherent in the process of evolution. |
| H3 | The more advanced an organism is in the evolutionary direction referred to in H2, the more valuable it is. |
| H4 | Humans are the most advanced organisms (in the evolutionary direction referred to in H2) of which we are aware. |

³⁵ Naess and Rothenburg 1989

³⁶ Schwartzchild 1984 cited in Fox 1995 p. 137

³⁷ Fox 1995 p. 136-137

³⁸ Fox 1995 p.p. 138-139

- N2 Humans! (i.e. Value Humans!, Further Human Evolution!, Further Humans and their Ends!)
- H5 Humans are capable of accelerating the process of evolution in the direction of increasing complexity by means of genetic engineering.
- N3 Genetic engineering!

There are a number of important points illustrated by this example. Firstly, the fundamental norm, *Evolution!* is not Naess's own, but with some individuals retains the characteristics he lays down for such a norm; further probing will not produce meaningful answers. Of course for some, the norm *Evolution!* would be derived from a deeper fundamental norm perhaps religiously based, or perhaps based on a Cartesian view of 'nature as machine', but for others, this would be the end of the chain of 'Why?' questions. Recall that Naess is explicit about the diversity of possible fundamental norms. Secondly, the while the derivation of these norms from the fundamental norm *Evolution!* is logical, it is by no means the only interpretation possible³⁹: indeed other possible interpretations would completely change the character of, or even reverse the derived norms. However, the arguments contained within the structure are logical, and so conform to Naess's definition of 'deep', if not to his vision of a Deep Ecologist's lifestyle.

³⁹ See Chapter Three

2.5.3 Abandoning *Deep Ecology* for *Ecocentrism*.

Fox argues, with some justification, that Naess's apparently failed attempt to frame an ecocentric perspective as the only one with a logical link to fundamental norms, is derived from a variety of personal and professional motives⁴⁰. However, this is of little consequence here; I wish only to show why I am not using the most widely accepted terminology, and to introduce Naess's technique of deriving normative systems.

There are a number of terms which can be used in opposition to anthropocentrism which warrant some discussion. Biological egalitarianism suggests a rights based equality of biological entities. However, this does not acknowledge the interconnectedness of natural systems, concentrating as it does on individual entities. Furthermore, given the death toll of other entities inevitable in even the most careful human existence, the only logical course of action for a person holding this view is suicide. It creates a moral flat-land, where decisions to create the least possible harm can be thwarted by the moral equivalence of different entities, although Michael makes a useful distinction between equal *treatment* and equal *value* in an effort to solve this impasse⁴¹. Finally, because of its individualistic viewpoint, it cannot consider non-living objects, such as the rocks which form part of an ecosystem.

Arguments based on the animal rights, commonly revolving around sentience⁴², may avoid the moral flat-land of the egalitarians, but share the drawbacks of a viewpoint based on individual entities. This is exacerbated by the smaller list of beings worthy of consideration, and difficulties of deciding which creatures are worthy of 'rights' and which are not.⁴³

Biocentrism abandons individualism, but maintains a distinction between living and non-living material, and so cannot be used to describe a philosophy based on

⁴⁰ Fox 1995 p.p. 141-145

⁴¹ Michael 1997 p.p. 307-323

⁴² Midgely 1983 p.89

⁴³ Animal rights arguments are more commonly used to criticise farming methods or the eating of animal products. In this sense, they are arguing from within the dominant cultural paradigm, not suggesting, as deep ecologists do, that a new paradigm is required. Thus to criticise animal rights theorists for not providing an alternative to Naess's problematic term *deep ecology* is not entirely fair.

Spinoza/Gandhi/Naess's notion of self realisation, and of Earth as a single biological system.

The term *ecocentrism* describes the worldview Naess is intending when he uses the term *deep ecology*, but it does not imply the *exclusive* philosophical link to deeply held values which is so problematic in Naess's work. By avoiding reference to individual entities, or to non-living material, it does not require arbitrary decisions to define the boundaries of a moral community. Finally, it is a term already in common use, and so does not add to the already confusing list of alternatives.

Ecocentrism is not without its critics; it has been argued that the process of assigning intrinsic value to the non-human world is itself a human construct, and as such is anthropocentric⁴⁴. While on a trivial level this is true, Dobson resolves the issue by the useful distinction he makes between strong and weak anthropocentrism.⁴⁵ Strong anthropocentrism is as already described, the view that the non-human world is of value only in terms of its use to humans, and is the opposite of ecocentrism. Weak anthropocentrism is being human centred, is an unavoidable part of the human condition, and is logically distinct from strong anthropocentrism. When using the term anthropocentrism, I refer always to the *strong* variety.

⁴⁴ Hayward 1997 pp. 49-50

⁴⁵ Dobson 1991 p.63-64

2.6 Evidence of Support for Ecocentrism

2.6.1 Lay People

Deep Ecologists undoubtedly exist; the existence of social movement organisations such as Earth First! and the statements and debates to be found in long established publications such as *Resurgence* magazine are evidence that strongly ecocentric values are professed by a social minority, and that these values are used to derive lifestyle choices (or perhaps are derived from lifestyle choices). However, none of these provide evidence for wider support for such values. Existing data on this issue is potentially unreliable, because of the difficulty identified by Fox⁴⁶ of probing individuals' sympathy to ecocentrism in anything but an in-depth interview. For example, Stern and Dietz concluded that there is no clear distinction in public consciousness between ecocentric and anthropocentric value orientations, but their survey items did not achieve the depth of questioning necessary to uncover ecocentric values⁴⁷. Lockwood contends that the difficulties associated with accurate measures of ecocentrism on a sufficient scale to allow inferences to be made about the whole population is an enormous, even unrealistic challenge⁴⁸. An incoherent or incomplete worldview with elements of ecocentrism and anthropocentrism may not be investigated beyond anthropocentric everyday activities, or dismissed as confused or irrelevant. O'Riordan's 1989 assessment of UK polling data shows between 0.1% and 0.3% support for ecocentric attitudes,⁴⁹ but it seems unlikely that poll data could achieve the depth of questioning required by Naess's methodology. Capra cites a 1976 study by the Stanford Research Institute showing 4-5 million Americans embracing voluntary simplicity, with a further eight to ten million adopting some of its tenets⁵⁰. A 1993 Dunlap, Gallup and Gallup poll (in the US) found 51% disagreement with the statement *Humans were created to rule over the rest of nature*, and 69 % agreement with the statement *Plants and animals do*

⁴⁶ Quoted in Dobson 1991 pp 68-69. See section 4.2 for a reproduction of this passage

⁴⁷ Stern *et al* 1994

⁴⁸ Lockwood 1999 p.p. 397-398

⁴⁹ Macnaghten & Urry 1998 p. 87

⁵⁰ Capra 1983 p. 459

*not primarily exist to be used by humans.*⁵¹ Rifkin cites a 1995 Associated Press poll in the US which shows 67% support for *animals have the right to pursue their own natural and essential interests and that an animal's right to live free of suffering should be as important as a person's right to live free of suffering*. He interprets this to mean that those animals have intrinsic value.⁵² Stern *et al* uncover what they term *biospheric* values in a sample of US students⁵³, which appears to include ecocentrism, but the nature and depth of the questions they use does not give results useful here. Here we start to see evidence for ecocentrism as more than a fringe belief, and while the results of these polls can be criticised for not probing the connection between these values and peoples' actions (As the biggest per capita consumers of natural resources on Earth, it is inconceivable that such high proportions of Americans actually *act* in a substantial way on these statements), but as evidence of a *latent* belief, these polls are important.

Arguably the most important study of ecocentric environmental values is Kempton, Boster and Hartley's 1995 *Environmental Values in American Culture*. While they do not use either Naess's notion of normative systems, or the term ecocentric, they use a combination of interviews to build the depth of inquiry necessary to reveal the complexities of environmental values, and questionnaires to test the wider sympathy for ideas generated in the interviews. Unlike earlier work along similar lines, Kempton *et al* focused exclusively on *lay* environmentalism, with concepts arising not from the writings of environmentalists and academics, but from the interview material itself. They contend that formal sources do not necessarily correspond to lay thinking, and so their use makes the uncovering of lay values more difficult.⁵⁴ Furthermore, the date of the study is important, since the perception of environmental problems appears to change over time, making the older studies increasingly less relevant. It is unfortunate for our purposes that the study was US based, but the cultural similarities between the US and UK and the absence of comparable UK work make it invaluable. Indeed according to Kempton & Craig, cultural and historical

⁵¹ Kempton, Boster & Hartley 1995 p. 103

⁵² Rifkin 1998 p. 102

⁵³ Stern *et al* 1993

⁵⁴ Kempton, Boster & Hartley 1995 p. 200

differences between the US and Europe tend to reduce the former's environmental concerns⁵⁵. It could be argued therefore that were this study replicated in the UK, the level of environmental concern would be greater.

Their interview material revealed three loose categories of environmental values, which they label religious, anthropocentric and biocentric. Religion-based values included not only specific religious teachings and personal interpretations of ambiguous religious messages, but also the assigning of a spiritual dimension to nature, and the use of religious metaphors. It is arguable that part of this could have been included under their biocentric category, but the authors do point out the blurred boundaries of their categories. Anthropocentric values included the obvious human-utilitarian arguments, including aesthetic appreciation, although the strongest feelings related to the preservation of the environment for future generations, with frequent and unprompted references made to the interviewees' own children. Biocentric statements included feelings of oneness with nature, akin to some degree of self realisation, and notions of rights for nature and intrinsic value.⁵⁶ It was found that respondents did not fit neatly into any one category, with statements often being made from all three. This, however, does not imply that the respondents were being contradictory; it is not unreasonable for someone with ecocentrist sympathies to also enjoy the aesthetic value of nature, and be concerned for the welfare of her children; I would argue that it is possible to hold only anthropocentric views, to hold both anthropocentric and ecocentric views, but not to hold only ecocentric views. Importantly, the study found that the environmental values uncovered formed part of a diverse system of values, which the authors consider puts environmentalism beyond the status of a passing fad⁵⁷, and which lends weight to the notion of environmentalism as a latent ideology.⁵⁸

The part of the study using questionnaires had five categories of respondents, selected to provide a range of expected degree of sympathy to environmentalism. At the 'extreme environmentalist' end of the spectrum, respondents were selected

⁵⁵ Kempton & Craig 1993 pp. 17-19

⁵⁶ Kempton, Boster & Hartley 1995 p. 114

⁵⁷ Kempton, Boster & Hartley 1995 p. 115

⁵⁸ By *latent ideology* I refer to a widely held set of beliefs which do not lead to action on the part of those holding them.

from members of Earth First!, a militant environmental group involved in direct action. ‘Moderate’ environmentalists were represented by members of the Sierra Club, a mass membership conservation group, whose work is not dissimilar to the wilderness preservation aspect of the National Trust in the UK. The anti-environmentalists were represented at the extreme by saw mill workers, whose jobs are under threat from efforts to save old growth forest, and at the moderate level by dry cleaning workers, whose industry has been subject to increasingly stringent emissions regulations. In the centre were a random group of the general public. The findings were surprising in two ways. Firstly, the level of environmentalism across all five groups was higher than might have been expected, even among those groups who have suffered as a result of environmentalism (see figure 2.2⁵⁹)



FIGURE 2.2

This result contrasts with the findings of Gilbraith in 1982, which are perhaps more intuitive, and are summarised in figure 2.3⁶⁰.

⁵⁹ Kempton, Boster & Hartley 1995 p. 201

⁶⁰ Kempton, Boster & Hartley 1995 p. 200



FIGURE 2.3

Here we see what Gilbraith terms the Dominant Social Paradigm firmly at the anti-environmental end of the spectrum, which accounts for current behaviour towards the environment, and hence the damage apparent. On the environmental side is his New Environmental Paradigm, with the public falling somewhere between the two, although with clear environmentalist leanings.

Secondly, as a result of the depth of their questioning, Kempton *et al* were able to find a *single* set of environmental beliefs and values.⁶¹ This finding is important because it shows that the American public have a widely held coherent set of environmental values. It also shows that there is no alternative set of *widely held* anti-environmental values. There are anti-environmental viewpoints of course, which may or may not be situated within a coherent worldview, but there is no consensus on what this worldview is. In figure 2.2, this is indicated by a spread of isolated points at the anti-environmentalist end of the spectrum.

The importance of this study lies in its combination of breadth and depth. Depth of questioning is necessary to uncover ecocentric viewpoints, as outlined by Fox above. Without depth, only the anthropocentric aspects of an individual's worldview will be revealed, and the assumption that those aspects represent the totality of the individual's worldview is easy to make, but seriously misleading. The breadth allows the findings to be generalised, and to make realistic claims concerning latent beliefs.

⁶¹ Kempton, Boster & Hartley 1995 p. 211

2.6.2 Experts

While the number of studies with sufficient depth of questioning to uncover ecocentrism among the general public are very low, such work among experts is almost non-existent. There appears to be a widespread assumption that the values uncovered in the Kempton *et al* study are a refuge for the ignorant, and that once a sufficient level of knowledge has been acquired to merit the status of ‘expert’, they are abandoned for the superiority of science (or other appropriate discipline). This assumption is underlined by the way in which technological advances are often communicated to the public. The process is an attempt at a unidirectional transfer of knowledge from scientists to public, in the hope that given the same information as the scientists, the public will reach the same conclusions as the scientists, and accept the technology. Although rejections by the public of technology deemed acceptable by ‘experts’⁶² have introduced an element of dialogue between expert and lay, this appears to be more a combination of public relations and fear of consumer power than any willingness to take seriously issues raised by the public.

An important 1993 study by Craig, Glasser and Kempton challenges this assumed, and often very apparent divide between expert and lay people. They interviewed senior policy advisors on climate change to four European governments, to explore their environmental values, and found, in a majority of cases a deeply held set of personal environmental values which they kept separate from their professional activities:

[...] a British Department of the Environment official replied [to the questions *Do you have environmental values?* and *How would you describe those values?*] that she had environmental values, but: “They aren’t supposed to come through in my work.” A Treasury official, who did not work primarily on environmental issues was more direct: “We try to give good economic advice rather than taking a bias on nature. We’re not attempting to build any of our values into that at all.”⁶³

[We have] a responsibility to nature itself, too, to try to let all different types of animals and other live things flourish [...]

⁶² Food irradiation is a good example of this. The technology was declared safe, but consumers rejected it, apparently on the grounds that it was ‘unnatural’, that good food doesn’t need irradiation, and association of the word ‘irradiation’ with the nuclear industry.

⁶³ Craig, Glasser & Kempton 1993 p.141

For me, it's one system... I see it as an integrated system. Therefore I would not undertake to separate [it], because then it gives the wrong impression to the people... First of all, as part of the system, you have...[a] responsibility to keep the system up. It's your share. It's your share because you are part of the system...[...]⁶⁴

One of the key tools in policy analysis which partly accounts for this discrepancy between personal views and professional advice is economics. Interviewees, commonly economists, explained clearly the theory behind the advice they gave, and then indicated that on a personal level, they disagreed with it, either because of inadequate use of relevant, but more complex economic techniques⁶⁵, or a feeling that economics was not an appropriate tool for the task. The policy arena requires its participants, arguing from whatever perspective, to use instrumental, i.e. anthropocentric arguments⁶⁶, or risk being marginalised⁶⁷, and while non-instrumental values do exist in policy, endangered species legislation is perhaps the main example, they remain unusual. Collingridge writes:

The debate between the two parties [the Ethyl Corporation and the US Environmental Protection Agency] could hardly be concerned with values, the values which were relevant were deliberately chosen for their general appeal. Instead the contest was about which side offered the best scientific case, was the best interpretation of the published scientific results that lead from petrol was harmful, or harmless? Many authors have commented on this dominance of debates by factual issues, and the unimportance of any explicit discussion of values, for example [a long list of references follow]⁶⁸

However, Collingridge notes that in this case, the scientific evidence was relatively straightforward. It was the unstated conflict of values between the EPA (human health) and the Ethyl Corporation (profit) which made the argument so intractable.

This study therefore seems to go some way to dissolving the divide between expert and lay. The experts seem to share more common ground with the ('irrational') public than they do with the policy they produce. That policy

⁶⁴ Craig, Glasser & Kempton 1993 p.148

⁶⁵ This could be because of a lack of knowledge of those techniques which still seem to be outside the mainstream of economics, or the difficulty of quantifying values in order to incorporate them into calculations. See for example Jacobs 1991 or Pearce and Moran 1994 for thorough explorations of this topic.

⁶⁶ Craig, Glasser & Kempton 1993 pp. 137-138

⁶⁷ For example, a participant at the RSM biotechnology conference in February 1997 attempted to discuss these values, and was ridiculed by most other participants (Soulsby 1997 pp. 49-50 contains a transcript of the exchange, but does not include the general mirth evident at the time)

⁶⁸ Collingridge 1987 p. 141

should be produced which not only fails to reflect the values of the public, but even the values of those making the policy seems to indicate a failure of that process.

The results of this study are similar to one undertaken by Naess in Norway. He sent a letter to 110 people with an influence over domestic environmental policy outlining the eight fundamentals of deep ecology detailed above, and asking for clarification of their environmental values.⁶⁹ His conclusion is a policy failure as outlined above, and a plea for the inclusion of basic value judgements into policy.

⁶⁹ Naess 1986

2.7 Co-existence of Ecocentrism and Anthropocentrism

O’Riordan’s juxtaposition of techno(anthro)centrism paints an incomplete picture of the relationship between the two. While it is hardly surprising that within an anthropocentric society some will hold ecocentric beliefs, and may try to live ecocentric lifestyles, the implication of O’Riordan’s diagram is that the two are mutually exclusive. However, according to Audi, general intrinsic and instrumental values can co-exist *within an individual*⁷⁰, which in the case of environmental values is illustrated by an ecocentric parent valuing the non-human world because her children will benefit from it. Conversely, it is possible for an individual to hold purely anthropocentric values; the parent may value the non-human world *only* for the benefits it may provide for her children, and not because she considers it to have any intrinsic worth.

Similarly, on a societal level, despite dissent from some individuals, as is arguably the case in the UK, anthropocentrism can be exclusive. However, a society embracing ecocentric values would inevitably also embrace anthropocentric values.

Were an anthropocentric society to choose to become ecocentric, or at least to adopt some of its practical applications, the process of change would be a long one, perhaps taking several generations. Conversely, the technology based prescriptions of the anthropocentrists require no societal paradigm shift, and so can be implemented comparatively quickly. This point is made by the influential green economist, Michael Jacobs; his prescriptions are presented as a short term (10 - 20 years) interim measure on the road to an ecocentric future.⁷¹

⁷⁰ Audi 1993 p.76

⁷¹ Jacobs 1991 p. xvii - xviii

2.7.1 Naess's Methodology and Conflictual Worldviews

It is here that the usefulness of Naess's methodology for constructing/deriving normative systems becomes apparent. This technique reveals the existence of ecocentrism on different levels, on a continuum (divided into four levels by Naess) between fundamental values and everyday actions. Equally, it reveals the possibility of other variants of environmental thought operating across the same continuum. Thus, it is possible, albeit with the disadvantage of hiding detail and complexity, to represent environmental thought on a matrix⁷². The following is an amended version of my original:

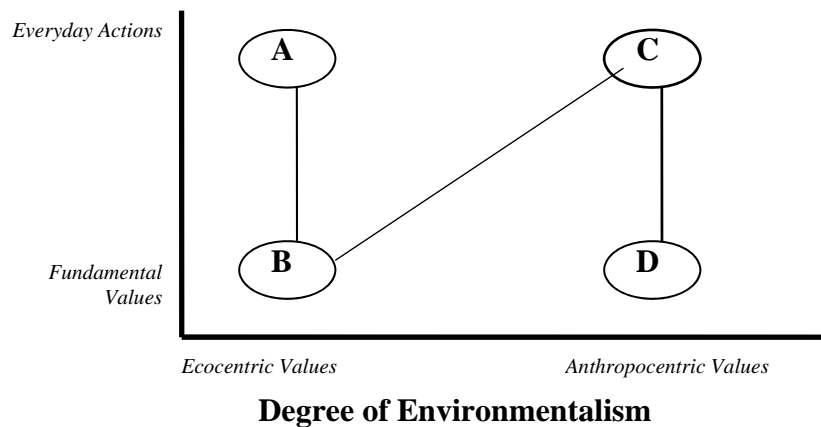


FIGURE 2.4

The vertical axis represent different levels of thought, with fundamental norms at the bottom, and everyday activities at the top. Thus the scale could be divided into Naess's four levels of norms.

The horizontal axis represents the continuum of environmental thought, between extreme anthropocentrists (Cornucopians to return to O'Riordan's terminology) on the right, and deep ecologists on the left. I do not wish to suggest that environmental thought can be adequately represented on such a continuum - the myriad of variants clearly do not fit such a construct, and the notion of measuring

⁷² Quaipe 1997

environmental thought quantitatively is absurd⁷³. However, the matrix does represent a useful conceptual tool, provided its limitations are borne in mind.

Theoretically, an individual can be located at a point somewhere along the top of the matrix with reference to their everyday activities. A Naess style interrogation could then be used to investigate that individual's normative system, each norm being a point further down the diagram, points which could be joined together to form a line representing that individual's profile of environmental thought. The process could equally be reversed, starting at the bottom with fundamental values, and working upwards to everyday activities. If an individual is logically consistent, their profile would be represented by a straight, vertical line; thus an ecocentrist would be represented by line *AB*, while an anthropocentrist would be represented by line *CD*. Any deviations from the vertical would reveal an inconsistent worldview. An individual's line need not stretch unbroken from the top of the diagram to the bottom - Naess's contention that shallow environmentalism can have no connection to fundamental values would be revealed on the diagram as a broken or incomplete line, or at least one where ecocentric fundamental values were linked by a diagonal line to anthropocentric everyday activities. The following is an example of an individual (a political advisor to the Swedish government) who would be represented by a broken line:

[This is] a great dilemma for me. Certainly I realise that the market system [is] best in order to achieve an efficient production. Increased trade between nations is also very important in order to reach a good material standard. The competitive advantages of free trade is certainly crucial and that is one of the main features of the market economy... But on the other hand, the whole idea of the market economy is to increase the consumption of materials all the time. That is very much contrary to my values. Certain aspects of the market economy are fantastic. Another aspect is working completely contrary to my personal views. And I can't resolve this. I'm probably desperate. I don't know what to do. I can't find a system which could combine the good aspects of the market economy system but not have this bad aspect, which is the consumerism... It is difficult, very difficult.⁷⁴

⁷³ Lockwood has attempted a more sophisticated scale of ecocentrism [Lockwood 1999 p.p. 384-385], which is unnecessary here. He also dismisses as inadequate attempts to measure ecocentrism, with the exception of Kempton *et al* (1995).

⁷⁴ Craig, Glasser & Kempton 1993 p.149

2.7.2 Dilemmatic Thinking

According to Billig thinking is not a process of rule following, but more closely mirrors public arguments, with conflicting positions being taken internally⁷⁵. These positions are typically derived from ‘common sense’, the shared ideas of a community, and the ubiquity of conflict within them is demonstrated by many of the maxims which describe it:

<i>Absence makes the heart grow fond</i>	<i>Out of sight, out of mind</i>
<i>Nothing ventured, nothing gained</i>	<i>Look before you leap</i>
<i>Many hands make light work</i>	<i>Too many cooks spoil the broth</i>
<i>Charity begins at home</i>	<i>Love thy neighbour</i>

According to Billig *et al*⁷⁶ experimentation has failed to divide such contradictory maxims into the useful and the useless, all seem to be useful depending on the circumstances of use, and the preference of the individual. Nor is the contradictory nature of the above examples rare or unimportant. Billig *et al* cite a table of maxims prepared by Francis Bacon in 1605 arranged in antithetical pairs⁷⁷ However, rather than dismiss common sense as hopelessly confused, and appeal to a more coherent philosophy such as Naess’s deep ecology, they agree with Bacon’s interpretation that such contradictions represent the *seeds* not *flowers* of arguments; they represent a shared repertoire of ideas which can be used by individuals to construct arguments in thought:

The very existence of these opposing images, words, evaluations, maxims and so on is crucial, in that they permit the possibility not just of social dilemmas but of social thinking itself. Without these oppositions there would be no way of arguing about dilemmas or understanding how opposing values can come into collision.⁷⁸

Thus dilemmatic thinking is portrayed as both commonplace and desirable. It suggests that ecocentrism, given the evidence of its popularity, is simply one of a multitude of common sense ideas people draw upon when thinking, and that

⁷⁵ Billig 1991 p.p. 31-56

⁷⁶ Billig *et al* 1988 p. 16

⁷⁷ Billig *et al* 1988 p.15

⁷⁸ Billig *et al* 1988 p.17

Naess's call for people to understand their 'real' needs through systemised, value-based thinking is psychologically untenable. However, in the light of Billig's work, Naess's normative structures can be interpreted as a new, and perhaps more satisfactory way of synthesising opinions from a raft of existing, contradictory ideas. While finding some support from lab-based social psychology⁷⁹ Naess's model does not appear to reflect the way people actually think in everyday situations. Arguably, however, Naess is not trying to present his model as descriptive, but as prescriptive; if only humanity could discipline itself to behave according to its values, the environmental (and social) crisis could be averted. Kempton, Boster and Hartley's work suggests that were Naess's methods applied to people's environmental values, given that there seems to be consensus over what those values are, that a greater degree of consensus over lifestyle choices could be achieved. Were such a consensus reached, Billig's insight that it may hide an underlying, conflicting set of ideas is arguably less relevant, since the practical and discursive outcomes would be the same. This argument also suggests that for environmental campaigners, a more fruitful approach would be to appeal to people's values, rather than only become embroiled in an attempt to gain sympathy for favoured parts of a wide range of conflicting notions about lifestyle choice.

Billig *et al* also raise a more mundane version of dilemmatic thinking, based on the restrictions placed on individual lifestyle by society. In the following passage, they are not specifically referring to deep ecologists, but their argument could easily apply to such an individual, for whom the most simple of everyday activities, such as boiling a kettle or travelling to work are likely to conflict with their ideology:

The very distinction between lived and intellectual ideology suggests one obvious source of an ideological dilemma. Ideologues and social theorists may face particular dilemmas because they simultaneously possess both sorts of ideology. Their thinking embraces both the great theory, constructed in the calm of the study and realized in its systematic completeness on paper, and everyday beliefs which enable the theorists to go about the normal business of society. For instance, a revolutionary idealist might hold grand notions about how society should operate. This idealist visions of the future will also be criticisms of the present state of society. Yet this idealist may have to conduct everyday activities and, in fact, may be quite well adjusted to many of society's practices. Sometimes the head of the lived ideology and the heart of the utopian

⁷⁹ Billig 1991 p.p. 37-43

ideology may pull in different directions. And at all times, the possibility of dilemmas may be present.⁸⁰

Daniel, writing about changes in US agriculture notes the conflictual messages emerging from an anthropological study of 200 southern farmers for the National Museum of American History. He describes present values as being *[an] ideology [...] that demanded control over nature*⁸¹ and notes that *ironically, many farmers who deplore present values are themselves beneficiaries of government programs and champions of technology.*⁸² Thus the farmers reject the current anthropocentric ideology, while being enthusiastic participants in anthropocentric agricultural projects.

2.7.3 Taking the Side of the Other

According to the outline of Billig's work above, thought can be seen as the process of internal argument, with discourse and behaviour the tangible results of that thought. The process is socially and temporally located, in that different circumstances may cause different arguments from the individual's repertoire to prevail, or cause different arguments to be considered. This creates the possibility of apparent about turns in explicit thought and discourse, in essence, people 'changing their minds'. Billig presents this process not as a sudden, unpredictable and irrational reversal by the individual, but a more subtle process where the balance of power between the various contradictory ideas the individual holds changes sufficiently to alter the outcome. This need not arise out of a fundamental change in beliefs (although it may do), but because an idea, which had previously been dominated by another becomes more influential to the point where it becomes dominant, as a result of altered social conditions. Underneath the expressed opinion, the same ideas remain, only their relative power has changed. Billig terms this process *Taking the Side of the Other*, and further posits that the process, in contrast to an attitude change which comes about in the light of new information, raises formerly implicit arguments to

⁸⁰ Billig *et al* 1988 p.32

⁸¹ Daniel 1993 p. 56

⁸² Daniel 1993 p. 54

explicit ones. He defines the explicit as ideas which form part of a rhetorical strategy used to justify a position, and implicit as those which may be articulated, but are undeveloped and may contradict at least to some extent the dominant rhetoric.⁸³

2.8 Conclusion to Chapter Two

Ecocentrism is a coherent ideology which conflicts with the anthropocentrism of industrialism. It postulates that nature has intrinsic value, beyond that of its utility to humankind, and that humanity is a part of, and not divisible from non-human nature. The principles of ecocentrism can be extrapolated to provide societal models and to make behavioural decisions, but there is little evidence that more than a small minority of individuals actually do this. However, there exists some evidence that ecocentric *values* are widely held among the general public, even amongst those who have reason to be hostile to environmentalism. Furthermore, there appears to be no alternative consensus in opposition to these environmental values.

Little research has been undertaken into the values of those involved in environmental policymaking, but the one study which does exist reveals ecocentric values similar to those uncovered among lay people, which conflicts with anthropocentric policy output. Some psychological literature posits the existence of dilemmatic thinking, which suggests that for individuals simultaneously to hold a repertoire of conflicting ideas is widespread, even necessary for the thinking process, and that discourse reflects the outcome of an internal debate between those ideas.

The combination of Kempton, Boster and Hartley's contention that there exists one consensus of environmental values, Billig's insight into dilemmatic thinking and the process of 'taking the other side', and Naess's method for deriving lifestyle decisions from values can be used to present ecocentrism as a latent ideology. Kempton, Boster and Hartley present ecocentrism as the only coherent, widely held set of environmental values, albeit not widely acted upon. Billig

⁸³ Billig *et al* 1988 p.p. 145-148

suggests how these values can conflict with behaviour, but also how they could lead to individuals 'changing their minds' about behavioural choices, and Naess suggests how values can be used to inform behavioural choices. Thus, according to these theorists, ecocentrism, more than being the belief system of a small group of devotees, has the *potential* to emerge as a new societal paradigm. Furthermore, since it appears to exist among policymakers, environmental policy appears to fail to reflect the ecocentric values of the public, not because the public are irrational, and need the guiding hand of experts, but because values are somehow excluded from the process.

This chapter has presented ecocentrism very much as an abstract concept. In the following chapter the ideas developed here are applied to the case of genetically modified food.

Chapter 3: Ecocentrism Applied to GM Food

By easy stages, we could move to a world which none of us would choose if we could see it as a whole from the start.¹

J. Glover

3.1 Introduction

This chapter considers the introduction of GM (genetically modified) food in the UK in relation to the notions of ecocentrism introduced in the previous chapter. It begins by outlining the technical details of genetically modifying food crops, and sites this process within agricultural trends. It then examines the positions of ecocentric theorists with regard to GM food, and concludes by juxtaposing the reductionist basis of GM food and industrial agriculture with ecocentrism.

3.2 Genetic Modification of Crops

The scientific details of genetic modification are beyond the scope of this thesis, but it is worthwhile to outline the basic principles involved.

Since the only GM food products currently available, and likely to be available in the near future are derived from plant sources,² this chapter considers only the genetic modification of crop plants.

Living organisms consist of one or more cells which are microscopic in size. The larger the organism, the more cells it has; an adult human has about 100 trillion cells. The workings of each cell are complex, and depend on the function of the cell, but all share the same basic structure. They are surrounded by a membrane, which in the case of plant cells is in turn surrounded by a cell wall. Inside the

¹ Glover 1977, cited in Mephram 1996 p.101

² Products such as cheese which use GM bacteria in the production process are available. However, no GM material is present in the final product, nor does the process lead to the release of genetically modified organisms into the environment.

cell, near its centre is a nucleus, which contains the genetic material. The remainder of the interior is cytoplasm.

Chromosomes, which are located in the nucleus are composed of deoxyribonucleic acid (DNA), whose structure is a double helix, the two strands being linked together by pairs of 'bases', the identity and sequence of which represents a code which in turn governs the behaviour of the cell.³ A section of DNA which codes for making a particular protein (protein manufacture is in effect the 'behaviour' of the cell) is termed a gene. When an organism grows, its cells divide, and the DNA they contain is replicated. Thus a genetically modified organism (GMO) either develops from a cell which has been modified, or from the reproduction of organisms which themselves are GMOs.

The modification of food crops is not a new technology, farmers have been selecting and interbreeding seed to improve or create desirable characteristics for more than ten thousand years⁴, to such an extent that food crops now bear little resemblance to their wild ancestors. The use of genetic modification has the same goals, but abandons the use of techniques which mirror breeding which could have occurred naturally⁵.

The EC define a genetically modified organism, as one *in which the genetic material is altered in a way that passes the natural barriers of mating and recombination*.⁶ Thus defined, genetic material from any source can be incorporated into the genome of any species. It can also be defined by technique: *Genetic Engineering means the isolating of a gene from one organism and inserting it into another*.⁷ In conventional breeding, the entire genomes from two closely related organisms are combined to form a new organism: there is no isolation nor insertion of single genes.

³ Straughan and Reiss 1996 p.p. 5-6

⁴ Nottingham 1998 p. 1

⁵ Not all traditional plant breeding exactly matches processes which could happen naturally. Plants can be bred artificially which would not breed naturally, but only when the species are closely related.

⁶ Dobson 1995 p.230

⁷ Yanchinski 1987, quoted in Dobson 1995 p. 229

A further important difference between genetic modification and conventional selective breeding is the speed at which the former can take place. Constrained by natural reproduction, conventional techniques produce slow changes in organisms, and so rarely produce anything radically unfamiliar.⁸

We can conclude therefore that the genetic modification of food crops represents a discontinuity in the process of plant breeding, and therefore can be expected to create new issues which may or may not be compatible with ecocentrism.

3.3 Genetically Modified Crops and Current Agricultural Trends

Modern agriculture is characterised by the growing on a large scale of single high performing varieties of crops, kept as clear as possible of competing weed species and pest organisms by an arsenal of chemical herbicides and pesticides. The rationale behind this method is that it provides high yields and enables most of the work required to be done by machine. Historically, in the UK, the higher yields produced a surplus which could be used to feed a larger population, and the lower labour input required allowed labour to migrate to urban areas to work in factories. In effect, the change to modern farming methods allowed the industrial revolution to take place. However, the change in the relationship between humanity and nature which this change brought about did not pass without comment prior to the emergence of the modern environmental movement. Marx writing in *Das Kapital*, published in 1867 comments as follows:

All progress in capitalistic agriculture is progress in the art, not only of robbing the labourer, but of robbing the soil; all progress in increasing the fertility of the soil for a given time, is a progress towards ruining the lasting sources of that fertility⁹

Genetically modified crops continue this pattern in the sense that they use the same technologically based model of agriculture. The cultivation of a single crop; a monoculture continues, although the method of pest control may alter somewhat. Of the crops currently being grown commercially, Monsanto's

⁸ Mellon and Rissler 1996 p *ix*

⁹ Marx 1977 p.p. 474-5

Round-up Ready Soya Bean is illustrative. The bean has been genetically modified to be resistant to glyphosate, a herbicide which would normally destroy the plant. In theory therefore, the task of weed control for the farmer is simplified - he need simply apply glyphosate, but it remains the same *in kind*.

From this section we can conclude that genetic modification of food crops represents a continuation of existing agricultural practices. However, this does not mean that the relationship to ecocentrism is unchanged. Recall that ecocentrism neither accepts nor rejects technology, but assesses each on its merits. Thus a group of technologies applied more intensively may become less compatible with ecocentrism.

3.4 Ecocentric Theorists and GM Food and Crops.

Much of the resistance to genetically modified food stems from the environmental movement, who seem to be almost unanimous in their objections to it. While not all environmentalists are ecocentrists, it would seem reasonable to suppose in the light of the above, that ecocentric theorists will be critical of GM food. The previous chapter gives an example of a normative structure created by Fox according to Naess's methods, designed to show an anti-environmentalist perspective based on excessive human interference with nature, which leads to the norm *Genetic Engineering!*¹⁰ Clearly here Fox considers genetic modification to be incompatible with ecocentrism (and environmentalism in a broader sense). Furthermore, according to Dobson:

[...] deep ecologists are likely to take up a *prima facie* position against genetic engineering precisely because it is a technology that expresses the very world view that they consider causes all the trouble: one of human mastery of the non-human natural world. The point, they say, is to develop practices and habits of mind that are an expression of membership rather than domination, of the non-human natural world. From this point of view the ethical argument is nothing less than an argument about what our relationship with the rest of the biotic (and abiotic) community should be.¹¹

He then criticises this position by accusing ecocentrists (deep ecologists) of “throwing the baby out with the bath water” by paying too little attention to the

¹⁰ Fox 1995 p.p. 138-140

¹¹ Dobson 1995 p. 231

benefits genetic modification might bring. However, this reading of the literature on ecocentrism seems to paint an overly simplistic picture of the relationship between technology and ecocentrism. Naess' work does not specifically mention genetic modification, but does have direct applicability to it. His eight point characterisation of deep ecology detailed in Chapter Two includes *Humans have no right to reduce this richness or diversity except to satisfy vital needs*¹². According to Mellon and Rissler:

In general, the research applications of genetic engineering have made possible giant strides in the understanding of the biological world and how it operates. Also many of the pharmaceutical applications of engineered bacteria offer effective therapies to patients, pose few risks to those who do not derive benefits, and have few viable alternatives. In agriculture, however, the situation is murkier. Here the benefits of agricultural biotechnology to a country [the US] awash in food and agricultural commodities are less obvious, the risks of environmental harm are greater, and the alternatives more plentiful.¹³

This passage could be used to argue that the genetic modification of agricultural crops does not satisfy a vital human need, but that some medical applications do. Thus an ecocentrist could accept the latter application of the technology while rejecting the former. However, an ecocentrist could also reject both, on the grounds that developing the technology for medical purposes would lead to its use for agricultural purposes. This is an example of where different ecocentric communities could reach different decisions about their behaviour from the same principles, and appears to deal with Dobson's objection.

The relationship between ecocentrism and agriculture in general is relevant here. The previous section outlined how genetic modification of food crops represents, in some respects, a continuation of current trends in industrial agriculture. Thus an exploration of ecocentrist attitudes to agriculture should be instructive, and Fox's contention that organic agriculture is a logical derivation of an ecocentrist position¹⁴ is a useful starting point. Organic agriculture does not permit the use of chemical fertilisers or pesticides, specifies higher standards for animal welfare than provided for by UK legislation, and forbids the use of genetic modification, either of the final product or as part of the manufacturing process. However, it

¹² Naess 1990 p.136

¹³ Mellon & Rissler 1996 p. 21

¹⁴ Fox 1995 p. 100

does not remove anthropocentrism from agriculture, since the process remains a manipulation of nature for the benefit of humanity. Crops and animals are used which have been bred over generations to serve humanity better, and natural processes are interfered with by promoting the growth of some species and inhibiting the growth of others, thereby maintaining an artificial environment. However, as in the above argument differentiating between different varieties of genetic modification, the acceptability of organic agriculture to ecocentrists compared to their rejection of industrial agriculture is a question of degree. Finding food can be considered an essential human need, and so provided the extent to which meeting this need compromises ecocentric principles is minimised, the practice is acceptable. The method of minimisation is not universally accepted however. It can be argued that it is better to cultivate agricultural land as intensively as possible in order to maximise the amount of land which can be set aside as wilderness, an approach termed *High-Yield Conservation*¹⁵. This position regards as paradoxical that environmentalists oppose the use of chemicals in agriculture, yet oppose genetic modification which is presented as reducing chemical dependency. There appear to be no ecocentrist writers who support this position, and the wider environmental movement appear to be near unanimous in their rejection of GM food crops; their arguments tend to revolve around the social, cultural, political and economic context of agriculture in addition to its technical detail. Typically they will also cast doubt on the assumption that industrial agriculture produces higher yields than organic and traditional agriculture,¹⁶ particularly the ability of the industrial model to sustain yields in the long term.¹⁷

Ecocentrism can also inform attitudes to the genetic modification of food by the relative importance it gives individuals and communities¹⁸. Fundamental to ecocentrism is the notion of communities of interdependent entities, which implies a subordination of the interests of the individual to that of the community.

¹⁵ Avery 1997

¹⁶ Shiva 1993 p.p. 39-49

¹⁷ Levidow and Tait 1995 p.p 129-130, Shiva 1993 p.p. 50-59

¹⁸ Recall that 'community' for an ecocentrist refers to all the parts, animal, vegetable and mineral which make up an ecosystem.

However, individuals retain importance as they represent instantiations of species, which may be described in terms of the organism's *telos* or nature. This argument necessarily rejects genetic modification by virtue of the alteration to the organism's *telos* it involves.¹⁹ While this argument may seem more appropriate to the genetic modification of animals than it does to food crops in the absence of sentience in the latter, because of the breadth of moral community embraced by ecocentrism it remains for an ecocentrist a valid position.

On the level of species integrity, ecocentrists fall foul of arguments between biologists over whether the concept of species is a viable one. Darwinism posits genetic changes over time, and individuals of any given species show considerable variation from one individual to another. Furthermore, according to Ho, genes may be transferred between unrelated organisms via a multitude of mechanisms²⁰, so here we see a notion of the species as a genetically porous concept, and the changing of a few genes within a species through genetic modification as being no more detrimental for the integrity of the species than the genetic changes which occur naturally. However, barriers to reproduction between species remain, so although the term may be less absolute than is commonly perceived it is still able to demarcate between reproductive activity which is, or approximates to that which could have occurred in nature, and that which doesn't. The genetic modification of species then can be considered as a higher level of anthropocentric interference than that used in traditional plant breeding, and it appears that, like the organic/conventional example above, it crosses a line which ecocentrists consider unacceptable. Moreover, according to Holland, for genetic modification to be acceptable to ecocentrists it should be conducted *in a manner compatible with the continued existence of the biosphere viewed as a community*.²¹ This implies, according to Dobson, that not only should individuals be given moral consideration as part of that community, but also species. It seems reasonable to assume given the well documented damage caused by the introduction of alien species into ecosystems²², that the genetic

¹⁹ Dobson 1995 p. 233

²⁰ Ho 1998 p.p. 154-166

²¹ Cited in Dobson 1995 p. 232

²² Peretti 1998 p. 183

modification of a species may sometimes have a detrimental effect on the ecosystem or community of which it becomes a part.

Ecocentrism also includes a powerful sense of the ‘rightness’ of what already exists. This derives from an emphasis on community - if the community of entities functions together, its components must be ‘right’ and should not be tampered with. Rolston expresses this as what *is* being a standard for what *ought* to be²³ This implies a blanket rejection of all genetic modification, even plant breeding. Again, for an ecocentrist, this is a factor to be minimised rather than be eliminated altogether, so that somatic gene therapy or conventional plant breeding might be deemed acceptable, while GM crops might not.

3.5 Genetic Modification and Reductionism

Genetic modification rests on the principle that an organism is defined by its DNA. This is an application of the more general principle of reductionism, which is the basis of modern science. Reductionism seeks to understand complex phenomena by an exclusive study of their component parts, which means that ultimately all phenomena can be explained by the behaviour of atomic particles alone, and that no “whole” is greater than the sum of its parts. Within genetics, this approach is explicit, and very much mainstream; the following is an extract from a genetics text book co-written by James Watson, Nobel Laureate and discoverer, along with Francis Crick of the double helical structure of DNA:

There is no substance so important as DNA. Because it carries within its structure the hereditary information that determines the structures of proteins, it is the prime molecule of life. The instructions that direct cells to grow and divide are encoded by it, so are the messages that bring about the differentiation of fertilised eggs into the multitude of specialised cells that are necessary for the successful functioning of higher plants and animals. [...] By now there exists an almost total consensus of informed minds that the essence of life can be explained by the same laws of physics and chemistry that have helped us understand, for example, why apples fall to the ground and why the moon does not, or why water is transformed into gaseous vapour when its boiling point is exceeded.²⁴

²³ Dobson 1995 p. 233

²⁴ Watson *et al* 1992, pp 1-2

This approach has elevated the status of DNA to such an extent that popular science writer and geneticist Richard Dawkins describes the purpose of life as being the replication of DNA:

They are in you and in me; they created us, body and mind; and their preservation is the ultimate rationale for our existence. They have come a long way, those replicators. Now they go by the name of genes, and we are their survival machines.²⁵

According to Lewontin, this view of DNA has extended biology into the realms of ideology, by using the model to explain collective human behaviour, and present current patterns as inevitable and unchangeable:

The claim that all human existence is controlled by our DNA is a popular one. It has the effect of legitimizing the structures of society in which we live, because it does not stop with the assertion that the differences in temperament, ability and physical and mental health between us are coded in our genes. It also claims that the political structures of society - the competitive, entrepreneurial, hierarchical society in which we live and which differentially rewards different temperaments, different cognitive abilities, and different mental attitudes is also determined by our DNA, and that it is, therefore, unchangeable²⁶

Nelkin and Lindee's study of the gene in popular culture presents DNA as an icon of the age, and take Lewontin's argument further:

DNA in popular culture functions, in many respects, as a secular equivalent of the Christian soul. Independent of the body, DNA appears to be immortal. Fundamental to identity, DNA seems to explain individual differences, moral order and human fate. Incapable of deceiving, DNA seems to be the locus of the true self, therefore relevant to the problems of personal authenticity posed by a culture in which the "fashioned self" is the body manipulated and adorned with the intent to mislead. In many popular narratives, individual characteristics and the social order both seem to be direct transcriptions of a powerful, magical, and even sacred entity, DNA.²⁷

The presentation of living entities and human society as defined by DNA (genetic determinism) is not directly related to ecocentrism, as it posits a view of nature which is centred around the laws of physics rather than being human or nature centred. Its amorality in this sense pits it against both anthropocentrism and

²⁵ Dawkins 1989 p20

²⁶ Lewontin 1993 p. 87

²⁷ Nelkin and Lindee 1995 p.p. 2-3

ecocentrism, despite the anthropocentrism of its application in genetic modification.

Reductionism reverses the prioritisation ecocentrism affords to different levels of organisation. Reductionism, by seeking to explain phenomena in terms of their component parts always assigns greater importance to those component parts, and still greater importance in turn to their component parts. This is the root of the importance attached to DNA in the above quotes, and the dream of Watson *et al* of atomic rather than ‘merely’ molecular explanations for biological processes. Ecocentrism, by stressing inter-relationships and mutual dependence posits that a whole is greater than the sum of its parts, which necessarily inverts the hierarchy presented by reductionism. Thus for an ecocentrist, the most significant entity is the biosphere, Gaia, or whatever term is favoured. It reverses Nelkin and Lindee’s portrayal of the gene in popular culture which presents the notion of community as irrelevant in the face of a mechanistically unfolding application of physical laws.

3.6 Conclusion to Chapter Three

This chapter had the potential to be extremely short. The unanimity of ecocentrists that genetic modification of food is incompatible with their beliefs is probably enough to answer the question posed here. Equally, it had the potential to be very long, by encompassing all of the arguments which environmentalists use, and therefore by default ecocentrists also, to criticise GM food. However, the chapter aimed to explore only those criticisms of genetic modification which are related specifically to ecocentrism.

Given the unanimity of objection to GM food, it is perhaps surprising that in practical terms that objection is, in essence, a question of degree. An ecocentrist, in order to remain alive must take part in, condone, or otherwise support activities which contradict his beliefs. Most relevant here is the conception of agriculture as the manipulation of non-human species for the benefit of humanity. For the ecocentrist therefore, the practical application of his beliefs is not one of absolutes, but of minimisation. It is not possible to live without some kind of agriculture, but it is possible to regret that aspect of one's existence, and to attempt to reduce it to a minimum. Ecocentrism does not provide a blueprint for this, depending as it must on geographical and cultural location, personal and group preferences, changing knowledge etc. However, it does present the use of genetic modification in agriculture as less compatible with ecocentrism than conventional models which clearly renders it unacceptable to ecocentrists. Avery's notion of high yield conservation which could be interpreted as bringing GM food back into the ecocentric fold, apart from resting on an interpretation of genetic modification with which ecocentrists appear to reject, also rests on the notion that conventional industrial agriculture is acceptable. However, for ecocentrists this is not the case; they advocate organic or traditional forms of agriculture. Thus, more than crossing a line which ecocentrists consider unacceptable, GM food is *two* stages removed from ecocentrist-compatible agriculture. Thus despite the absence of a defined line between what is acceptable to an ecocentrist, and what is not, the incompatibility of GM food and ecocentrism is clear cut.

Chapter Four: Methodology

4.1 Introduction

This chapter aims to cover the practical aspects of undertaking this research project; in essence the move from the idea of *what* to research to *how* to research it. Fundamental issues such as the type of data to be collected are discussed, focusing particularly on why unstructured interviews were used, and quantitative methods not used. Emphasis is also given to the role and influence of the researcher himself, particularly the impact of his own opinions on the issues involved, shaping as they do the nature of the project, the collection of the data and its interpretation. Some aspects of this are also covered in Chapter Five where the issues of non-respondents and the systematic bias away from the revealing of inconsistent worldviews are considered.

Finally, practical considerations are covered, specifically how interviewees were selected and the manner in which interviews were conducted, followed by how the interview material was subsequently reduced and analysed.

4.2 Qualitative versus Quantitative Data

The need for the use of qualitative data was immediately apparent in this project. Firstly, the uncovering of ecocentric values was, in most cases more complex than simply asking the respondent if she held such values. The term can be a difficult one to communicate to interviewees, particularly if it is a topic they are not accustomed to thinking about. In addition, the nature of ecocentric values means that they can be compatible with anthropocentric values, and their articulation often depends on circumstance. The following quote from Warwick Fox illustrates the problem:

Consider the following. If you ask me to try to tell the 'average person' in one sentence why I think we ought to care about some nonhuman 'being' (whether alive or not), then the simplest thing for me to say, given our present cultural context, is along the lines: 'Because it has all these uses for us'. However, if I

wish to get a little closer to what I really want to say, but at the same time take care to speak in terms that others will immediately understand rather than in terms that might sound alien to them (and, hence alienate them), then I will probably say something along the lines: 'Because it has value in itself'. Unless we have a lot more time to talk, the last thing I am going to say *given the present cultural context* is the first thing I want to say: 'Because it is part of my/our wider Self; its diminishment is My/Our diminishment'. In other words, given the constraints of culture, desire to persuade, and limited time in which to try to communicate something clearly, my *popular* statement of 'basic principles' will, while reflecting my deepest views, nevertheless be an unreliable or superficial guide to the way in which I would elaborate these views in formal, philosophical terms.¹

Fox's position mirrors Billig's more general point that the meaning of a piece of discourse cannot be determined without knowledge of its context, or which counter-position is being implicitly or explicitly rejected.² In Fox's example, the first encounter is of short duration in the context of an anthropocentric society, presumably with someone unfamiliar with the tenets of Deep Ecology. Without this knowledge, it might wrongly be assumed that Fox is not ecocentrist. Given more time to talk, he is able to reject the notion of anthropocentrism, a rejection which is absent in the short encounter, but which is relevant to the meaning of the discourse. The likelihood of being able to unravel this in any form other than a long, unstructured interview is remote. However, Lockwood, in a paper discussing methodological issues surrounding the uncovering of individuals' environmental values outlines some of the problems with this approach:

A characteristic feature of value construction is the relatively large influence of a variety of task, context, context and personal factors (Schkade and Payne 1994). Surveyors can therefore have a significant effect on the expression of values by the way the problem is defined, and the information that is presented. One approach to addressing these problems is simply to present the person with as little information as possible. However, this increases the likelihood that the responses are not answers to the same question the surveyor has in mind. The best approach is an explicit recognition of the researcher's role in the creation and expression of values.³

Thus the uncovering of the narrative the interviewee uses to justify their position has to be done, as far as possible, by allowing her to set the agenda in the interview. It would be possible, but highly misleading, to construct in advance a possible way in which such a position could be maintained, and guide (or push) the interviewee through that narrative via a standard series of questions, which

¹ Quoted in Dobson 1991 pp 68-69

² Billig 1991 p. 44

³ Lockwood 1999 p. 390

could then be analysed quantitatively. This part of the project did not (and could not) start with a list of all possible options, which the interviewee could be asked to choose between. Clearly there were arguments which were expected, but there are infinite possibilities for the construction of narratives linking values with actions, which can only be revealed by allowing the interviewee to take whatever direction they wish. However, during many of the interviews, there existed a tension between excessive directing of the interview and a failure to elicit useful responses.

While it is possible to place interviewees in broad categories, which indeed was done to provide structure to the interpretative part of the thesis, and provide a crude quantitative presentation of the numbers of respondents in each category, this was not the purpose of the project, nor would it have yielded useful results given the number of interviewees and the way in which they were selected. However, the representativeness of the interviewees selected is in part a function of the size of the population of potential interviewees. With the exception of one interviewee⁴, all interviewees were key actors within the debate, or were the most relevant representative of key organisations, which meant that the number of people who could have been interviewed was low. In these circumstances, the notion of a representative sample starts to break down, and quantitative analysis of results less meaningful.

Armed with the necessary resources, the study referred to throughout this thesis by Boster, Kempton & Hartley (1995) used a quantitative analysis of a far larger body of interview material to provide a useful supplement to the qualitative aspect of their work. In addition they were able to use concepts generated by the interview material to devise a questionnaire, the responses to which were used to provide generalisable quantitative results. Aside from the lack of resources which precluded taking this additional step, it is clear from many of the interviews, particularly those from the business community, that respondents often try to avoid answering questions about their personal environmental values, and go to great lengths to avoid deviating from the 'corporate line'. In an interview situation where material can be tape recorded, transcribed and studied

⁴ Mark is not a key individual, nor does he represent a key organisation. The reasons for his selection are outlined in Chapter Five.

at leisure, this problem can sometimes be overcome, or at least reduced. A questionnaire would make question avoidance much easier, and as discussed in greater detail in Chapter Five, create a greater bias away from finding respondents whose values conflict with their actions than is already the case.

According to Potter and Wetherell:

Another method is to adopt follow-up questions which pose alternative or problematic views or facts for the interviewee. If the interview is seen as a forum in which the respondent regurgitates preformed and largely static opinions, this approach will seem strange; but if it is viewed as an active site where the respondent's interpretive resources are explored and engaged to the full this will seem perfectly natural.⁵

The other key study referred to in this thesis is Craig, Glasser and Kempton's work on EC environmental policy advisors. Like this study, they were interviewing from a small population of influential individuals, and they make the following comment, which vindicates the approach taken here:

As with most interviewing at the level of senior advisors to governments, this was not a 'random' sample, and we do not compute statistical indicators from the interview data.⁶

⁵ Potter and Wetherell 1987 p. 164

⁶ Craig, Glasser and Kempton 1993 p. 138

4.3 The Use of Grounded Theory

Running throughout this project was a tension between the theoretical attractions of grounded theory, and practical considerations which favoured a tightly defined research question.

A **grounded theory** is one that is inductively derived from the study of the phenomenon it represents. That is, it is discovered, developed, and provisionally verified through systematic data collection and analysis of data pertaining to that phenomenon. Therefore data collection, analysis and theory stand in reciprocal relationship with each other. One does not begin with a theory, then prove it. Rather one begins with an area of study, and what is relevant to that area is allowed to emerge.⁷

To some extent, a resolution of this tension was provided by the research topic itself, dividing as it did naturally into two parts. The first part, derived from a review of the theoretical literature and evidence from empirical studies, suggested that one would expect to find considerably more individuals with ecocentric environmental values than individuals whose behaviour is consistent with those values. Thus the first part of the data collection set out to establish whether this was true in relation to individuals involved in introducing genetically modified food, and so by defining in advance the research question the need to search for questions was removed; the answer was all that was sought. This part was in effect a selection of the field of research, but in this instance, selection could not occur arbitrarily according to the wishes of the researcher, since firstly the existence of such a value/action conflict is not established beyond doubt; some research indicates that it does not exist⁸, and secondly the conflict, if it exists at all, is not universal, and so in order to proceed to the second part of the data collection, the presence or otherwise of this conflict needed to be ascertained for each interviewee. Support for this approach in defining the field of research comes from Wolcott:

it is impossible to embark upon research without some idea of what one is looking for and foolish not to make that quest explicit⁹

⁷ Strauss & Corbin 1990 p. 23

⁸ Macnaghten & Urry 1998 p. 87 cite a 1989 study by O’Riordan which identifies between 0.1% and 0.3% support for ecocentric ‘attitudes’. While value/action conflicts are not specifically referred to, without ecocentric values, no conflict of the type under investigation here are possible.

⁹ Wolcott 1982 p. 157

The need for a tighter, more structured research design in the work of inexperienced researchers is outlined by Miles and Huberman,¹⁰ providing as it does clarity and focus, while containing diffuseness and overload.

The nature of the second part of the research question made a more structured approach problematic. Locating any value action conflict involved, by necessity, allowing (or encouraging) the interviewee to articulate the narrative by which they maintained that conflict, and thus the content of the interview had to be dictated as far as possible by the interviewee. Ideally therefore, input from the interviewer should have been limited to introducing the topic of the interview, and allowing the interviewee to say what they felt was relevant. However, this was in no case possible with conflictual interviewees, and rarely with any other category (see for example Robert and John), so frequent interjections from the interviewer were necessary to ensure, not always successfully, that the necessary ground was covered. This practical constraint on the interviews immediately introduced the agenda of the interviewer, and imposed on the interview the scope of the knowledge about the field he had amassed beforehand (See quote from Lockwood above). At times, this also introduced an adversarial element to the proceedings where interviewees seemed to consider questions about their values an attack on the moral integrity of their professional actions, and an attempt by the interviewer to impose his own views on genetically modified food. The latter issue is considered in more detail below, but more generally, that the attempt to exhume an internal contradiction can sometimes create an unhelpful adversarial slant to the interview is perhaps not surprising.

Although no pilot was undertaken, early interviews were used to provide material for later interviews. This was partly because they revealed themes which were more likely to lead to fruitful questioning, but also because they allowed the interviewer to avoid ownership of the questions, e.g. *I was interested to see that person x used y argument. What is your reaction to that?* and thereby to diffuse potential conflict.

¹⁰ Miles and Huberman 1994 p. 17

Thus the second part of the data collection was rooted in notions of grounded theory - once the existence of a value/action conflict was posited, no hypothesis regarding how such a conflict was maintained by the individual was put forward, but evolved from the interviews as they were conducted.

4.4 The Neutral Researcher

Ideally, the researcher is an impartial interpreter of observable phenomena. This concept is an ideal type, and cannot in practice be realised. This section aims to uncover those areas in which the ideal type has been deviated from, and outline the measures taken to reduce this deviation to a minimum.

The research topic was not dictated externally, or from a logical progression from earlier projects. The general theme of conflicts between ecocentric values and anthropocentric lifestyles arose from an interest in the underpinnings of the environmental movement, while the selection of genetically modified foods as a case study was at the time an obvious choice for an emergent controversial environmental issue, on which comparatively little research had been done. Thus from the outset, neutrality was compromised; interest in the environmental movement came about partly as a result of sympathy for its aims, and, inevitably, as knowledge of the movement increased, personal standpoints on the various issues within it became more developed. The particular focus on value/action conflicts arose in part from personal experience trying to equate a fairly typical anthropocentric lifestyle in the UK with a value system wholly incompatible with it.

It is difficult to imagine any researcher being able to maintain a detached viewpoint on a case study so universally relevant as food, and so this inevitable interest combined with the interplay between GM food as an issue and the environmental movement removed any chance of uncontrived impartiality.

Throughout the project, and particularly during the fieldwork, this bias in my own viewpoint was kept in mind as much as possible, in order to try to reduce its impact on the project. However, the core of the fieldwork was probing interviewees about ecocentric values, and how those values interact (or not) with

their work. Many interviewees clearly did not grasp the purpose of the interviews, although I made every effort to explain it, and considered that the proper topic for discussion was the detail of their professional work. In those circumstances, the introduction of ecocentric values by the interviewer would immediately cast the interviewer as an environmentalist, whether or not that was the case. Thus it can be argued that when researching this topic, the views of the interviewer are less relevant than at first appear, because the line of questioning necessarily creates the impression that the interviewer is himself ecocentrist. When interviewees seemed to be uncomfortable with this perception, the situation was often improved by explaining that confronting the statements of the interviewee was a useful technique for exploring those statements in greater depth.¹¹ This perception was also reduced by devoting time during the interview for the interviewee to explain their viewpoint in a deliberately non-confrontational atmosphere, with the interviewer's input being limited to encouraging nods and other comments indicating understanding of the interviewee's position.

In order to be able to conduct the interviews successfully, and to give credibility to myself as a researcher, it was necessary to familiarise myself with the types of arguments interviewees were likely to use. Although this process did little to alter my own opinions of the issues involved, it did enable more balanced coverage during the interviews, and often evidence of knowledge of the interviewee's work or views on my part, elicited more detailed responses. Conversely, given that a high proportion of interviewees were scientists, I found my own lack of scientific knowledge helpful when trying to introduce the arguments put forward by environmentalists. Typically: *I'm not a scientist, although I have looked at some scientific literature. I'm finding it really difficult to reconcile the writing of those scientists who appear to be against GM food, who typically write about uncertainty and risk, with those who appear to be in favour, who write about the technology as precise and predictable.....* This approach enabled me to probe views about the interpretation of science, without presenting myself as having arrived at a conclusion in advance. Although this device was most commonly used in this context (due to the number of scientists),

¹¹ See the preceding quote from Potter and Wetherell

the stance of an informed, interested lay person seemed to elicit the most useful responses while best concealing my own views.

Away from the interview situation, coping with personal bias is more problematic. While bias necessarily influenced the material that was gathered, I believe that this effect was evident mainly in the selection of the research topic. Once the topic was selected, and the interviews underway, the techniques outlined above reduced the effect of this bias. However, analysing the results involved reducing the data - a process of selecting parts of the data to illustrate the themes running through it. This process carries with it the danger that excerpts are selected, perhaps out of context, to back a conclusion reached in advance. With this in mind, most of the excerpts are long, giving the context in which the remarks were made, and without editing out caveats the interviewee may have added to their statements.

The task of the researcher at this point is to interpret the data he has collected, and this is the next point at which personal agendas can impose themselves on the final result. A possible way round this, which I rejected, is to redefine the role of researcher to be more akin to that of a journalist, providing only excerpts, and allowing the interviewees to speak for themselves¹². The supposed removal of bias here is an illusion, since the biased researcher has conducted the interviews, and selected the excerpts. The presentation of interview material is a process of interpretation which contains bias, and picking a point to cease that process based on the false assumption that bias would only exist if the process continued past that point is misleading, and takes away from the researcher the chance to make a useful, if flawed, contribution to the understanding of the reader. I have elected to attempt an interpretation of the data, while keeping in mind, and making explicit the sources of bias.

Miles and Huberman frame the question of the interest of the researcher differently. When considering the ethical dimension of qualitative research, specifically the 'worthiness' of the project, they write:

¹² Strauss & Corbin 1990 p. 21

In general, a study that is only opportunistic, without larger significance or real meaning for you [the researcher], is likely to be pursued in a shallow way, with less care devoted to design and data collection. First conclusions may not be questioned; follow-up analyses with rival hypotheses may be rare. The report will be written to “look good” rather than to be right.¹³

This insight concurs with the researcher’s own experience where interest in the material provided much of the motivation to complete what was a long and difficult process. In that sense, while disinterest may have removed some of the bias from the project, it may also have led to non-completion or at least to a lower standard of work.

4.5 Selection of Interviewees

The novelty of this project rested partly on the use of ‘experts’ as subjects. This notion of expertise referred less to knowledge *per se*, but of participation, although the two are, of course, mutually re-enforcing. Thus for an individual to make a suitable interviewee, their professional activities must have an influence over the introduction of GM food. This influence may be direct, where an individual is personally involved in the process - perhaps as a government advisor, or as an industry representative. It may also be indirect, for example where an individual is involved in the formation of an organisation’s policy on GM food, but does not participate in the debate outside of the organisation. However, very few interviewees fell into the latter category exclusively; the majority of interviewees can be considered as important, often well known individuals whose contributions to the debate are considerable.

Miles and Huberman suggest the following typology of sampling techniques¹⁴, several of which correspond to the methods used in this project. Some of the methods were used to overcome various practical and methodological problems.

Type of Sampling	Purpose/Description
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¹³ Miles & Huberman 1994 p.p. 290 - 291

¹⁴ Miles & Huberman 1994 p. 28

Maximum Variation	To document variations and common patterns
Homogenous	To focus, reduce and simplify
Critical Case	To permit logical generalisation
Theory Based	To find examples of a theoretical construct
Dis/Confirming	To elaborate initial analysis and seek exceptions
Snowball/Chain	To build sample dynamically
Extreme/Deviant	To learn from highly unusual manifestations
Typical Case	To highlight what is normal or average
Intensity	To locate information-rich cases of certain case types
Political Case	To avoid/attract attention to study
Random Purposeful	To add credibility when purposeful sample too large
Stratified Purposeful	To illustrate subgroups and facilitate comparison
Criterion	To locate cases of given criterion
Opportunistic	To follow new leads and advantage from unexpected opportunities
Convenience	To save money, time and/or effort
Comprehensive	To examine every case in a given population
Quota	To examine instances of identified subgroups
Reputational	To build sample on recommendation of experts
Comparable	To select cases to promote replication over time

Table 4.1

In general terms the notion of a random sample being used to generate statistically significant, generalisable conclusions was considered to be inappropriate, and probably not achievable even with greater resources (see section 4.2). The depth of information needed and the nature of the research question precluded a large number of interviews being carried out,

In chronological order, the first problem was the controversial nature of genetically modified food. Although at the time of the interviews, comparatively little media coverage and public interest in the topic was evident, it was clear to most involved that some level of controversy was likely to be generated in the

future. It was anticipated therefore that some difficulty would be encountered gaining access to interviewees, particularly those whose work could be construed as promoting GM food, or those working for commercial organisations for whom avoidance of hostile publicity is important. In an effort to overcome this problem, initial interviewees were carefully selected whom it was felt were more likely to agree to participate in the project, and whose participation might help to persuade more reluctant interviewees to co-operate. As part of this process, voluntary work was undertaken at an NGO in order to assess more accurately than was possible through more formal sources who were the most appropriate individuals to approach. It also allowed a greater depth and currency of knowledge about the field than was possible from any other source. While being associated with an NGO created the risk of being perceived by pro-GM food interviewees of being unacceptably biased, it was probably the only way in which the necessary information could have been gathered. NGOs generally operate on tiny budgets, and rely heavily on volunteers who are articulate and computer-literate in order to function, who are of course in short supply. The NGO I worked for were aware of my motivations for volunteering, and were happy to allow me to use information gained while I was there to help generate my sample of interviewees in return for my labour. This kind of arrangement was only possible because of their lack of resources, and would not have been possible with any other kind of organisation involved in the field. Some effort was made to downplay involvement with the NGO in order not to jeopardise the fieldwork; when writing in their publications, pseudonyms were used, and I did not volunteer information about my work with them. However, at no time did I deny my involvement, and on numerous occasions represented the NGO at conferences and meetings, at which I used my real name. These appearances gave a limited perceived association between myself and the NGO for which I worked, although this perception was mainly, but not exclusively among other NGOs.

Early interviewees then were selected according to Miles & Huberman's *Opportunistic* category, but at the same time, elements of the *Political* category were important. It was felt that the participation of individuals with high credibility in the field would help persuade other, perhaps less sympathetic individuals to agree to be interviewed. There was also a danger given the

upsurge of activist interest in the subject, that I would be suspected of not being a legitimate researcher, but an activist with ulterior motives. To help dispel this possibility, and also to avoid being identified with the stereotypical environmentalist, I had my long hair cut short just prior to the first interview.

This political strategy appeared to be successful, although it did preclude the use of a pilot study by concentrating at the beginning of the study several important actors from a relatively small population; they were too important to dismiss as pilots. In the event, while the techniques used in the interviews were refined over the period of the fieldwork, the early interviews were of sufficient quality to be usable. Arguably, since the interviews were unstructured, there was little to test during a pilot, and no ideal format to be arrived at.

The first few interviewees were approached on the basis of information gleaned at the NGO¹⁵, and all were asked at the end of the interview who they thought I should also speak to. Almost without exception, interviewees were willing to give contact details of individuals that they felt I should include, and in many cases permitted their names to be used in my approaches to them. Thus a combination of Miles & Huberman's *Snowball/Chain* and *Reputational* categories were used. This approach quickly generated more interviewees than available resources could cope with. At this stage, rather than allowing interviewees to self-select, which was producing a skew in favour of certain groups of interviewees while leaving others unrepresented, representatives of specific subgroups were targeted, although the identity of specific individuals often came from other interviewees. Thus to the earlier *Snowball/Chain*, and *Reputational* methods was added the *Quota* method. The initial skew was deliberate - I did not approach those interviewees who I expected to be reluctant to participate until I had generated a list of well known participants with which to increase the credibility of the project. Thus the last group was individuals involved in the mainstream food industry, but even here the expected resistance did not materialise.¹⁶ This appeared to be due to those individuals feeling unable to cope with the emerging controversy surrounding GM food, and welcoming the

¹⁵ By coincidence, a key interviewee had recently been interviewed by a colleague on an unrelated project, and was suggested by him as a likely participant.

¹⁶ Only one rejection letter was received, from a multinational food corporation, although of course many organisations did not respond.

opportunity to talk to someone with a different perspective to their own. In one case, access was gained to a multinational food company with a general policy of not speaking to researchers, the reason for which became clear when talking to the interviewee who had very little knowledge of the issue despite having high level responsibility for policy on GM food. In effect, an interview was granted in exchange for a lecture on the implications of the new technology.

The difficulty of getting access to biotechnology companies also shed light on the comparative ease with which access was obtained to the food industry. In general, the food industry presented itself as the victim of the US biotechnology industry (although they rarely criticised the technology itself, rather its marketing). This meant that they did not have to defend the technology, since they were not given the option of avoiding it. Instead of being pitted against their usual adversaries, the environmental NGOs, they found some degree of common ground with them, and so were less reluctant to participate in a study which appeared to be critical of genetic modification. By pressing for labelling and segregation, the food industry seemed to be keen to distance itself from the biotechnology industry, and perhaps saw this project as an opportunity to emphasise the point. In contrast, it is not surprising that the biotechnology industry who at the time were the subject of almost universal criticism were reluctant to participate. The sole interviewee from the biotechnology industry represented a company which had been praised for its approach, which perhaps explains why access was granted.

Finally, and regrettably, the limited resources available for the project compelled an element of the *Convenience* method. This limited primarily the numbers of interviewees which led to an inadequate or absent coverage of some sub-groups, but also influenced which interviews were conducted on the basis of travelling time and expense, and the possibilities of combining several interviews in one trip. This meant that potential interviewees who were London based, or at least visited London regularly were more likely to be included in the project. However, given the UK focus of the project, this issue did not have a great effect on the identity of interviewees.

4.6 The Interviewees

The interviewees were all given anonymity, whether or not they requested it, and were allocated pseudonyms, which apart from accurately reflecting gender were selected arbitrarily. All the names used are common in the UK, which reflects the interviewees themselves, all of whom with only one exception appeared to be white Europeans who spoke English as a first language. However, no attempt was made to ascertain the ethnic or cultural origins of interviewees. The interviewees are described more fully in Chapter Five.

The fieldwork relied heavily on the goodwill and co-operation of the interviewees. Given the politically sensitive nature of the topic, and the seniority of the interviewees, I was surprised by their willingness to participate in the project. However, the period in which the fieldwork took place is an important factor here. All the interviews took place between January and June 1997, at which time media and public interest in the topic was comparatively low. Several interviewees from the food industry commented that the level of correspondence from their customers was extremely low, to the point of being negligible. While it was clear that interest would increase as more GM products became available, no interviewees, with the possible exception of those representing NGOs seemed to foresee the level of public hostility that would become apparent in subsequent years.

At this time, the issue of GM food was conceptualised by government and industry as one rooted in scientific notions of safety. Although some attention had been paid to ethical issues, the linking of the technology to values either formally or through expressions of public concern¹⁷ did not appear to have been considered by these actors. This left them without a prepared position on relating environmental values to GM food, or even any apparent conception that such values had any relevance to it. Thus the time at which the interviews took place had an important effect on the ability to secure the participation of key actors, and the usefulness of the material gathered from them.

¹⁷ See for example Grove-White *et al* 1997

4.7 Interview Protocol

The necessity of using long unstructured interviews has already been introduced, which combined with the wide diversity of interviewees¹⁸ made the use of a formal interview protocol impossible. However, a general approach to conducting the interviews was used, albeit one which required modification for each interviewee together with fine tuning and improvisation during the interview itself. This section uses excerpts from one interview to illustrate how the approach worked.

For the majority of interviewees I felt it likely that it would be difficult to persuade them to talk about their environmental values. To reduce this problem, a major objective of the early part of each interview was to make the interviewee feel comfortable with both the subject matter of the interview and me as the interviewer. All interviews therefore started with a topic I felt the subject would wish to talk about. This required advance research on my part to identify an appropriate topic, to acquire sufficient knowledge to be able to engage the subject in meaningful discussion, and in order to appear credible. This was evident in small interjections by me which pepper the transcripts. In the following excerpt I raise the topic of the power UK supermarkets wield in the food chain:

PQ: You are unusual aren't you in Britain. Supermarkets have much more power.

Brian: That's right, that's right. In Europe, you've got to do what the branded people say. The manufacturers have far more power. And even.... and that's especially true in America as well. Which is why [the US biotech industry] thought, oh well, we can treat the Europeans and certainly the British in the same way that we treat the American consumers.

For Brian, an interviewee from a food retailer, the choice of opening topic was obvious. He had been involved in the launch of a GM food which had been widely praised for the way in which it had been introduced, and the early part of the discussion revolved around the success of the product. Perhaps in this case, the approach was too obvious, and Brian himself pre-empts the move to the next topic:

¹⁸ See section 5.3 for details of this diversity.

Brian: It's earned its place on the shelves like everything else... Right, what do you want to ask me really?! [laughs] I've told you my bit!

PQ: I've actually already touched on what is really the essence of what I'm looking at. I'm interested in the way that the different groups and other similar debates actually engage with each other. It is a simplification, but it illustrates the point I want to make, is that the pro lobby, generally tend to use very scientific, very economic arguments - instrumental arguments, whereas the anti groups as I mentioned before tend to use different arguments: moral, ethical, emotional arguments, and because of that the two often fail to engage with each other. [...]

The next topic, outlined in the above extract was how the subject interacts with the different interest groups involved in the debate. This was used in most interviews as a way of introducing discussion about the agenda of environmentalists without straying from territory with which the interviewee would be familiar. In addition, as most participants had difficulty engaging with their opponents, this was often a topic of some interest to them. This section often yielded valuable insights into interviewees' attitudes towards environmental issues and environmentalists, and provided much of the material used to describe how subjects justified their professional actions.

A method often used when it was felt appropriate was to introduce the notion of scientific uncertainty and of competing scientific claims to understand how the interviewee coped with the issue. The following comment is typical of the type of response this produced. Here, Brian sums up his favoured approach to the safety of GM food by making a distinction between proof of hazard and proof of safety:

PQ: [...] What I'm trying to probe is where you would draw the line [about scientific uncertainty] . I'm not trying to say that I'm either for or against it. [lengthy discussion follows about instances of scientific uncertainty relating to food]

Brian: We need scientific evidence that the doubt exists. Put it that way round.

I then started to introduce more abstract topics, the first being the symbolic nature of the first GM food. The following is typical of exchanges on that theme:

PQ: What I think people like [NGO] are bothered about is that this whole issue is completely hijacking the debate that they think should have happened before that. What direction do we go in with agriculture, because it is, after all, really important. How do you feel about that?

Brian: They've got a point in an ideal world. Unfortunately we don't live in an ideal world. We've got to deal with the real world. In an ideal world, you talk to our customers, they'd like to shop on the High Street, or in village shops, and traipse from the butcher to the baker to the greengrocer, and they certainly don't want this wide choice of 30,000 products. So they'd like to go back to how

things were in the old days. Of course they wouldn't. When it really comes to it, give them the chance, this is why we are successful. Because they want to be here. So do you honestly think that people are going to take part in a debate in this country, the masses, in this country, on what agricultural policy should be? Erm, there is no way.

Moving onto more abstract territory, the notion of ethics and professional activity was introduced, primarily by seizing upon material introduced by the interviewee:

PQ: OK.. Something else I'd like to talk about, you mentioned that you don't have an ethics committee.

Brian: If you talk to [name] they set up an outside crowd.

PQ: A sort of ethical audit type thing?

Brian: Yes. Erm, because it's more and more supplier based. That's why we don't. Erm, we say to our suppliers, we want proof from you that you're not employing child labour when picking the bananas in Ecuador.

PQ: So you do deal with it,

Brian: Oh yes.

PQ: So what actually drives that. What would make you decide that you don't want to deal with child labour picking bananas wherever it is?

Brian: Erm, well it's wrong. This not a good thing.

PQ: But who decides that, do you decide that, or...

Moving on to the issue of the relationship between GM food and environmental values, a method which was often, though not always successful in eliciting responses was to talk about the importance of biodiversity. In this interview, Brian evaded all questions relating to his personal values, which he does in the following extract:

PQ: Going beyond that though, one of the things that's been talked about with GM foods, is whether or not it will increase or decrease biodiversity.

Brian: Yep.

PQ: Now I'm not a scientist, and I don't really want to get into a big discussion of the pros and cons of the different arguments, but do you think that that's an important debate to have from a personal point of view?

Brian: Erm, yes, if we know enough. It's like the all the people having a go, shout at us from the outside, mostly because they haven't got any of the information you've got. And therefore they go on what they get from reading the newspapers. I don't know enough about biodiversity, really, erm... to... do other than say right, government is signed up to things like Montreal Protocol, and provided we as a company are not doing anything which breaches those agreements, then we're doing "the right thing",

Other topics used here included the reasons why one might wish to conserve Giant Pandas or Antarctic ecosystems which have no obvious use for humanity. Finally, all interviewees were asked whether they had environmental values, and if so how they would express them. In the following example, Brian is continuing to evade personal questions, and I am making one of several attempts

to persuade him to talk. It illustrates how the topic tended to be broached, and also how leading questions were sometimes used to draw subjects into topics they may have been reluctant to discuss - in this case without success.

PQ: But what I'm really trying to get out of this though, is your personal view really, on why... I mean you've said that you have environmental values, why do you think things like that are important... I don't know... consideration of future generations.... because you happen to like the countryside, because you have religious beliefs, there are any number of reasons why those things might be important.

Brian: Well, we're a corporate member of the CPRE...

PQ: But I mean you as a person. I'm interested in you as a representative of [company name]

Brian: Right.

PQ: But also you as an individual, because you are both of those things

Brian: Yes.

The following section of transcript¹⁹ illustrates a successful attempt to persuade the interviewee to talk about their environmental values:

PQ: OK Moving on into even more abstract terrain, would you say on quite an abstract level that you have environmental values?

Sally: What me personally?

PQ: Mmm.

Sally: Yes, oh yes, I do.

PQ: How would you describe them? I know that is a bit of a big question.

Sally: Well I think its consciousness of the natural environment really, and your impact on the species and the plants and animals that are out there, so I would try and protect those if I could.

PQ: Why do you feel that way?

Sally: Well I think everything's interconnected and that err if you do lose species that it contributes to the general degradation of peoples lives and the quality of life and so you look back over hundreds of years and see what's been lost, you would actually see quite a degradation because its happening on such a small scale, people don't notice.

PQ: Do you mean because its happening so slowly.

Sally: Yes, people sort of get used to it and they adjust and they perhaps don't realise that perhaps there hasn't been the degradation in their environment when indeed there has.

The interviews then concluded with the interviewee being asked if there was anything they would like to say followed by a request for suggestions of other people I might interview.

In summary, the interviews generally started with a discussion of the subject's professional work and moved on to talking about how they interacted with those holding opposing views before moving onto the more abstract territory at the

¹⁹ This interviewee is described in more detail in section 6.3.3

heart of the project. These were introduced by considering the symbolic nature of the first GM food which led into linkages between ethics and professional action and the relationship between GM food and environmental issues. Finally, direct questions about environmental values were asked, both through the use of examples and in more abstract ways.

In this way, the interviews represented a gradual build-up to the topic of environmental values by introducing this abstract, possibly alien concept through the use of more familiar topics. These gave useful pointers towards effective ways of improvising an introduction to the topic in addition to providing detail of the structure of the subject's arguments.

4.8 Data Reduction

While the data could have been presented in its entirety, leaving the reader to draw their own conclusions from it, this was rejected for theoretical reasons (see above) and for practical reasons: the transcribed interviews extended to some 500,000 words. Therefore a method for converting the data into a more manageable form was necessary. Miles and Huberman (1994) define data reduction as the process of:

selecting, focusing, simplifying and transforming the data that appear in written-up field notes or transcriptions²⁰

Initially this was done by attempting to piece together the essence of the interviews by constructing vignettes from extended excerpts from the interviews alongside interpretative text. This was performed for each interviewee, and formed the basis of chapters five and six. The primary use for these vignettes within the structure of the thesis was to categorise respondents, and to paint a picture of why they were allocated to their categories. However, their practical purpose extended beyond a simple categorisation. As can be seen from the examples presented in the thesis, and bearing in mind the quote from Warwick Fox reproduced earlier in this chapter, the uncovering of ecocentric values in an

²⁰ Miles and Huberman 1994 p. 10

individual is a complex process involving contradictions, red herrings, misunderstandings and sometimes an evolving sense of rapport between interviewee and interviewer. However, the culmination of this lengthy process is often a very short statement of ecocentric sympathies which taken in isolation can appear trivial and prone to be taken out of context. Thus the vignettes attempt to describe the process leading up to the statement of ecocentrist sympathies.

The placing of statements of ecocentrism in context allow, for the relationship between values and actions to be explored. If an individual acts in a way which is inconsistent with their beliefs, there must be a point at which a justification for this inconsistency, or at least a gap in the respondent's arguments must exist. Each interviewee is, to a greater or lesser extent, different to the others, and so this process of exploring conflict can only be done interviewee by interviewee.

The use of vignettes also allowed the inclusion of material not contained within the transcripts. Although every effort was made to ensure the accuracy of the transcripts, such documentation can only be a partial record of what took place during the interview. Apart from statements made away from the interview, perhaps before or after the tape was used, on another occasion, non-verbal interaction, or nuances not reproducible in transcripts were also present. With a few interviewees, a powerful sense, particularly of their environmental values emerged from the encounter, which was difficult if not impossible to include in the vignettes with reference to excerpts from the transcripts. On the few occasions these insights were considered important, they are mentioned in the text, and are based on notes taken shortly after each interview.

Owing largely to the volume of interview material collected, it was felt prudent to use some kind of computerised coding, to allow for the retrieving and organisation of data. QSR Nud*ist was used to assign labels to lines of text which could later be retrieved either individually or in combination to produce a theme based analysis which was to form the basis of chapter seven. For example, where interviewees were talking about the potential for genetically modified crops to increase food security in poor regions, the code "3world" was added to the relevant lines of text. This meant that when writing the section in Chapter Seven which discusses this issue, all the relevant data could be called up quickly

and easily. Part of the coding was done automatically, by instructing the program to search for certain words, and attach an appropriate coding to the text surrounding that word. This was appropriate for words with unambiguous meanings, such as the names of organisations, but was ineffective for subjects which lacked a unique but universally used word to identify them. Thus more nebulous ideas had to be coded manually, a process which in addition to being inherently useful for the generation of reports by Nud*ist, forced a greater familiarisation with the data, and allowed themes to emerge more easily. In the event, when it came to write the theme based analysis, familiarity with the data was such that it was more expedient to work directly from the transcripts within a word processing program than to generate reports from Nud*ist. This was due in part to hardware difficulties running QSR Nud*ist alongside a Word Processing package. However, Nud*ist was used to check the transcripts for additional evidence, supportive or otherwise, for the thematic points made in the analysis. It should be emphasised that this method of working was only possible because only one researcher was working on the project. Had two or more researchers been involved, more extensive use of computer coding would have been necessary.

4.9 Data Analysis

The separation of data reduction from data analysis is somewhat problematic, since the former is an integral part of the latter. However, an arbitrary division can be made between the process leading up to the production of the vignettes which largely comprise Chapters Five and Six, and the theme-based analysis of Chapter Seven. Despite this division, it is arguable that the bulk of the analysis had already been completed with the vignettes. Essentially, Chapter Seven involved drawing out the themes which were used by respondents to justify their position, and searching for possible reasons why some arguments were popular, and other arguments were rarely or never used. The process of data reduction had, by this time reduced some 500,000 words of transcriptions to a few thousand

words of excerpts and explanatory text, and the drawing of conclusions from it was relatively straightforward.

The possibility existed of attempting a finer grained discourse analysis of the type advocated by Potter and Wetherell²¹ among others. The use of vignettes was partly in response to the difficulty of dealing with the sheer volume of data collected, and the undertaking of a finer grained analysis would have increased the difficulty of dealing with this data. Furthermore, the abilities of the researcher and the time available precluded the extension of the analysis into this domain beyond the influence this field had on the interview technique used, and some cursory observations within the analysis. This is not to belittle the potential of Potter and Wetherell's methodology for shedding more light on the subject area under investigation. On the contrary, it is clear that, to quote from Billig:

For instance, Gilbert and Mulkey (1984) show how scientists, when talking about science, will use different repertoires of explanation and accounting. When scientists discuss their own work, they speak as if science were a matter of using precise techniques to 'discover' elements of reality. By contrast, when they talk about rival theorists, they offer very different accounts; they will use psychological explanations to speak about rival scientists soured by their own stupidity. [...] According to discourse analysts, this variability in talk is to be expected. In different interactions, and at different junctures within the same interaction speakers will be using different forms of talk to accomplish different sorts of task.²²

Here then is a clear direction for further study, possible with the same data. The data could be reduced to proportions commensurate with such an analysis by taking *typical cases* (recall the table of sampling methods reproduced above), and enriching the vignettes already produced by considering in detail the *language* used by the interviewees in different circumstances. Such an exercise would require more detailed transcripts perhaps including pause lengths, hesitations, overlaps and intonation. Potter and Wetherell estimate that including such additional information increases the time taken to transcribe a one hour tape from ten to twenty hours.²³

²¹ Potter and Wetherell 1987

²² Billig 1991 p.p. 15-16

²³ Potter and Wetherell 1987 p. 166

Chapter Five: Non-Conflictual Interviewees

5.1 Introduction

This chapter develops a broad typology of interviewees based on both the interview data and the theoretical considerations of the earlier part of the thesis. It then continues by considering those interviewees whose values were not uncovered, and those interviewees who did not show a conflict between their values and their professional activities.

5.2 A Typology of Interviewees

Chapter one outlines Naess's methodology for developing and/or understanding values based worldviews. Despite the impossibility of such an *ideal type* actually existing, when interviewing a group of experts involved in genetically modified food, one could reasonably expect to uncover at least some respondents who approximate Naess's ideal, particularly among those working for environmental groups. Furthermore, one could also expect to find individuals who fulfil Naess requirement for 'depth', but based on anthropocentric values. Finally, based on Kempton, Boster and Hartley's work, one might expect to find individuals who have ecocentrist sympathies, but do not use such ideas in their everyday activities, thus exhibiting, at least to some degree, an internal conflict.

The categories can usefully be represented on a matrix, including an additional category which is explained below:

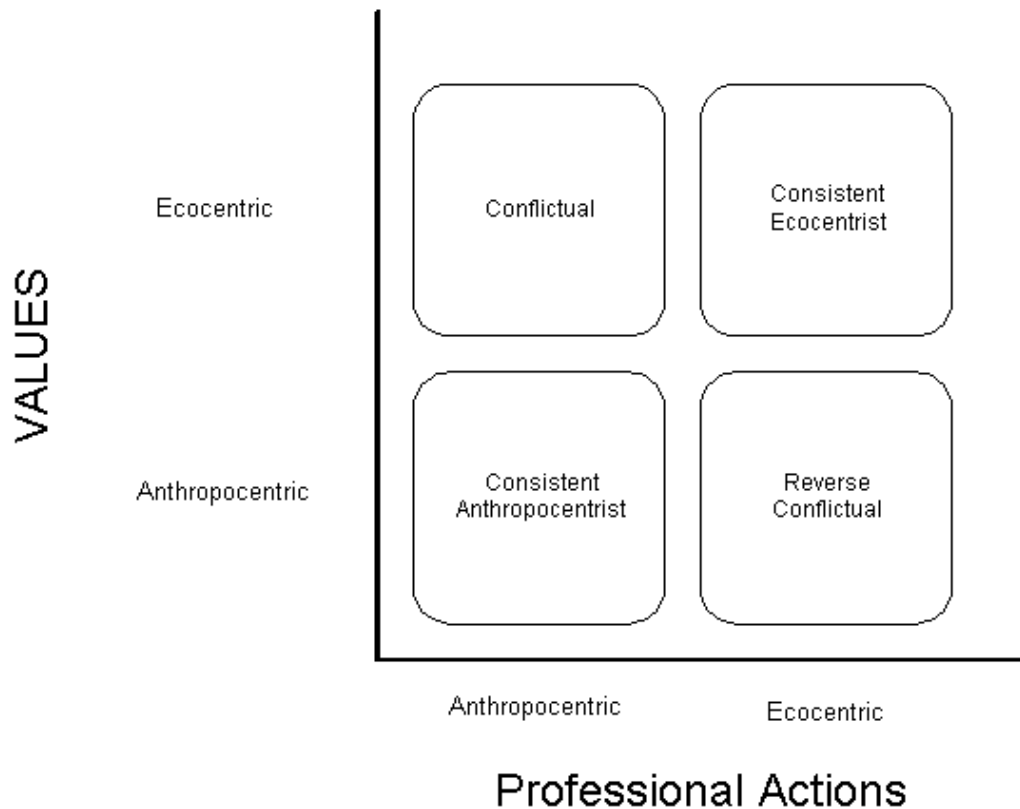


FIGURE 5.1

For the sake of consistency, a fourth category has been introduced for those who have anthropocentric values, but are ecocentric in their everyday actions. One would expect no interviewees to fall into this category, which was indeed the case.

The three occupied categories are defined as follows:

Ecocentric are those who have a fairly coherent Ecocentric mindset, although aspects of their lifestyle may be at variance with this.

Anthropocentric are those who have a fairly coherent anthropocentric, and usually also technocentric mindset.

Conflictual are those for whom there is a mismatch between their fundamental values, or at least as near to fundamental as could be uncovered in the interview, and their professional work. In all cases, their values were more ecocentric than their actions.

5.3 The Interviewees

The table below lists each interviewee by pseudonym, indicates which broad category of respondents they have been allocated to, and gives some idea of their professional capacities. This section is deliberately vague, as more concise descriptions would compromise anonymity. Abbreviations for professional capacities are as follows:

Ge	Geneticist or similar
Ad	Government advisor
NG	NGO
FI	Mainstream Food Industry
Sci	Scientist (other than geneticist)
Ac	Academic (includes retired and former academics working in industry)
Gv	Government employee
Bio	Biotechnology Industry
AF	Alternative Food Industry (Ethical, organic, wholefoods etc.)

Pseudonym	Category	Ge	Ad	NG	FI	Sci	Ac	Gv	Bio	AF
Alan	conflictual	☐	☐				☐			
Andrew	anthropocentric				☐	☐				
Anne	ecocentric	☐		☐						
Brian	not identified				☐					
Carl	anthropocentric	☐	☐				☐			
Carol	ecocentric				☐					
Charlotte	conflictual		☐	☐						
Chris	conflictual	☐	☐		☐		☐		☐	
Dennis	conflictual	☐	☐				☐			
Emma	conflictual	☐	☐				☐			
Eric	conflictual	☐	☐				☐			
Graham	conflictual					☐		☐		
Henry	anthropocentric	☐	☐				☐			
Hugh	not identified				☐					
Janice	conflictual		☐	☐						
Jim	conflictual				☐					
John	ecocentric			☐						
Marie	anthropocentric				☐					☐
Mark	ecocentric									
Mary	anthropocentric				☐					☐
Mike	ecocentric			☐		☐				
Paul	anthropocentric				☐					
Robert	ecocentric			☐						
Sally	conflictual				☐					
Sarah*	not identified				☐					
Simon	conflictual	☐		☐						
Sue	conflictual		☐	☐						
Totals	27	9	10	8	11	3	7	1	1	2

Table 5.1

* Sarah is the only interviewee who is not mentioned in either this or the next chapter. This was due to technical difficulties with the tape.

The unequal representation of the different categories is as a result of the difficulties of gaining access to some categories as opposed to others, the lack of resources available which restricted the number of interviews possible, the multiple professional positions of many of the interviewees, and the emphasis needed on conflictual respondents. For example, John and Mark amply demonstrated the existence of ecocentric respondents, but since the purpose of the

thesis was not to explore in depth the narratives constructed by such individuals, it was considered unnecessary to attempt to uncover further examples.

The following table clarifies the number of interviewees falling into each category, with the exception of Sarah:

Category	Number
Ecocentric	6
Anthropocentric	5
Conflictual	13
Not identified	2
Total	26

Table 5.2

5.4 Unplaced Interviewees

A number of interviewees could not be placed into the above matrix because while they were able to explain their professional activities, they did not articulate their personal values. It is inconceivable that those individuals had no values, and it follows therefore that the interviews failed to uncover them. This was not entirely unexpected, and various explanations are possible, although none testable with the data collected.

5.4.1 Professional Reticence

Some interviewees, particularly those working for retailers are accustomed to presenting a well-rehearsed corporate image to the public. These interviewees were particularly difficult to persuade to talk on a personal level: they were unable, or unwilling to move beyond their professional discourse, and in some instances evaded all questions relating to their personal values.

Food retailers are aware that their customers are worried about the prospect of eating genetically modified food, but are also aware of the limited scope they have for providing choice. Faced with a possible public relations disaster, as

companies they are understandably reluctant to say anything which might increase public hostility, and so have formulated positions from which they will not stray. For an individual to move beyond this corporate stance would clearly be dangerous.

In addition, more than any other group interviewed, food retailers are accustomed to presenting carefully crafted arguments to the public, so individual employees, particularly at a senior level could be expected to be proficient at restricting responses to material contained in corporate policy. Indeed some interviewees' role within their organisations was formally defined as *Public Relations*, so it was perhaps not surprising that they did not respond as individuals.

The following is an excerpt from an interview, where the respondent never refused to respond, but repeatedly moved away from talking about personal values to descriptions of professional activity. This continued throughout a lengthy interview, which resulted in little that was usable in terms of locating his value system.

PQ: [...] would you say that you have environmental values?

Brian: Oh yes. I can give you lots of different pieces of paper which tell you what our environmental values are...

PQ: I mean you as a person.

Brian: Oh I see.... yes. Erm... in terms of recycling, or something like that. I will make the effort.

PQ: Why do you think that's important?

Brian: Well that's come from work, what I've learnt at work. I mean I used to be director [...] for this company, yonks ago, erm, and that's why we ended up in the Green Consumer Guide two years running, as the most environmentally acceptable supermarket. Shows how rotten the rest were. But we had the principals in place. We started recycling cardboard in 1971....

On a simpler, but no less important level, it is difficult to imagine a respondent admitting that he acts professionally in a way which he finds morally unacceptable, whether or not that was the case:

PQ: [...] do you find personally that there's ever any kind of conflict between ethical/moral views that you may have and work that you do in this plant, do you ever feel uncomfortable with what you say?

Paul: No not at all, erm...

In this example, Paul had little option but to give the responses he did, unless the interview had taken place after he had left the employer to which he was referring. It was probably pointless asking this questions. This contrasts with

Anne (below) who left her profession in order to be able to escape such a conflict, and to be able to talk about it.

5.4.2 Values as an Unfamiliar Issue

Some interviewees seemed not to be evading questions on their personal values for professional reasons, but seemed to have difficulty with the concept itself. Given that for many individuals a conflict exists between their actions and their values, a possible and arguably sensible way of handling this conflict is not to think about values, thus hiding any conflict. For such an individual, being suddenly expected to produce, in a short space of time, a coherent and concise answer to a question about their values is perhaps unreasonable. Although many who appeared to be in this position were able, not without some difficulty, to describe their values, this factor would seem to place a systematic bias against finding individuals with value/action conflicts.

In the following example, Hugh fails to grasp (or perhaps I fail to explain adequately) the notion of intrinsic value. He seems willing to engage with the material, but is evidently puzzled by why it is relevant to my work:

PQ: Would you subscribe to the idea of nature, putting aside for the moment the problems of defining what is natural the idea that nature has a value intrinsic to itself beyond that which is used for work.

Hugh: I'm not sure that I understand the question.

PQ: If I describe it as a practical example, people get very bothered these days about whether or not giant pandas exist in China and most of us will never see a giant panda in China we might see photos of them but that's about the only thing. So what are the arguments for preserving giant pandas and other species. Is there something inherently good about them just being there. Do you think that's a reasonable argument?

Hugh: It's a very difficult argument if you are living in the UK then it's not your problem, if you're living in China, as a subsistence farmer, then you've got giant pandas coming down and raiding your crops, all you want to do is shoot them. I don't think you can see this as black and white.

PQ: But on a personal level, on general terms, it's always difficult to bring in specific examples because you can also bring in specific problems as you have rightly pointed out with the Panda but in general terms there is an intrinsic value. Is that a bit clearer now?

Hugh: I think that you can preserve pandas because they look quite appealing it's nice to see them but why clear out a species when you don't have to. But when you start talking about rats and scorpions then maybe you have a different context. People do not want to preserve rats for their intrinsic natural value.

PQ: So it's not really something that you have much sympathy with?

Hugh: Well I wouldn't want to go down as being an opponent of preserving the Panda.

PQ: Getting away from the examples of the Panda in more general terms things like, I don't know, preserving the rainforest in Brazil aside from their environmental services that they give everybody. Do you think that it's important that they are there just for their own sake. Do you like to think of them being there and not like being chopped down.

Hugh: I don't think you can make that distinction because if you think of the rainforest then it is in part the breathing process of the earth, if you like. The earth's lung image. I don't think you can dismiss away this, you can dismiss a desert. What does that contribute to the process. I don't think you can isolate things just for intrinsic value you've got to look at their function

The exchange continued, but resulted in little that was usable in understanding Hugh's environmental values. Although he makes clear anthropocentric statements here, he says nothing that is incompatible with also holding ecocentric views. Since he did not understand the concept of ecocentrism, he had no opportunity to give his view of it.

5.4.3 Values as an Uncomfortable Issue

Most interviews took place in a professional context, with both interviewer and interviewee dressed formally in an office environment. It is arguable that such a setting expedites discussion of professional action, being a site of such action, but inhibits discussion of personal issues using discourse which tends not to be used in a work environment. Setting up interviews away from such environments was impossible for most interviewees for practical reasons. Like the previous section, this factor is likely to create a bias against finding individuals with value/action conflicts, as it seems likely that those with no such conflict would be more comfortable talking about values.

5.4.4 Values and Gender.

With all interviewees, partly in order to encourage responses to the more personal questions, an effort was made to establish a rapport with the interviewee. The form of this rapport was often dependent on the gender of the interviewee, which in turn perhaps affected the responses to the more personal questions. With some male interviewees, this rapport took a stereotypically masculine form, with discussion emphasising technical and scientific issues, which made talking about softer value based issues more problematic. This type of rapport was not confined exclusively to male interviewees, but seemed to be stronger and more frequent in those cases.

The possible association of values with femininity was perhaps a limitation of the data collection, which could arguably have been reduced by a female interviewer. Again, this factor seems to reduce the likelihood of finding value/action conflicts.

5.5 Ecocentric Interviewees

The work of Naess is, from a theoretical perspective, central to this thesis. It relies on the notion that while most individuals do not have a coherent normative structure as Naess proposes, that it is *possible* to think in that way, notwithstanding Billig's insights into the argumentative nature of thinking. In order to test this aspect of the theoretical work, and to provide a contrast with other interviewees, several individuals who might be expected (from their professional positions) to have a coherently ecocentrist worldview were deliberately sought out. Some did, to varying degrees exhibit this and are explored in this section.

5.5.1 Case Study: John

John is an organic farmer, and is a key member of the organic movement. The interview took place in a pub close to his office.

John was unlike any other interviewee in this project in that he immediately grasped the thrust of the interview, and described an example of where he had deliberately set out to uncover the same action/values contradiction I was looking for:

John: [...] before you [a group of food retail executives] decide what you can do, let's just talk about it, let's talk about whether there is any single person round this table that is content with the prospect of virtually all their staple foods being from genetically engineered organisms within a decade. [This refers to a presentation made by a senior Monsanto representative a few days before] Is there anybody round this table who's happy with that?" Do you know, not one person said that they were happy with that.

PQ: Yeah, I can well believe that.

John: And that was really interesting, because that, suddenly they were touched, and this is the point that I'm making, that there is a difference between the corporate mentality: "Let's go for it chaps" and your own personal value system.

PQ: Yes.

John: And that's what happened both in this conference where I raised this point and round this dinner table.

He then went on to emphasise the importance he attaches to this contradiction:

that's why what we're going to do..... we're going to win.[referring to banning genetic engineering from agriculture] That's why we're in an incredibly strong position. We are in a very strong position on several ways. We are in a strong position because of that, because there is no doubt that on a personal level.... it is rather like the big arable farmer who uses pesticides on all their crops but has an organic vegetable garden, there are plenty of those around, the majority of large scale arable farmers do not use the pesticides that they use on their crops in their own back gardens.

The link between values and action has driven the whole of John's career, so unlike the majority of interviewees, not only was he able to talk about his value system and the link to his professional activities, it was clearly an issue which concerned him from day to day. Unusually, he did not have to spend time putting his feelings into words, it was obviously something which he was accustomed to talking about:

[...] I had gone through my childhood and adolescence with a great interest in ecology and environmental issues, social issues so I put all that together and I wanted to do something about that in my practical life, and so the influences that were on me... such that all those questions arose, so the point where I emerged from the threshold of a career and they were what was right for me. And so I then organised my training around becoming more knowledgeable about agriculture, first by working on an ordinary farm, and then doing an organic agricultural course, and then starting farming. And so it was always a beliefs, or a value driven career right from the start, and then having farmed organically for more than a decade I just became more and more involved with the Organic Movement [...]. [My work in the Organic Movement] is a perfect fit with what I did practically before and I think what is interesting, is that I'm in a privileged position you could say, of my professional position not being in any way at odds with either the practical um, delivery system for what I'm preaching, or my own personal ethical value system and that is, I suppose, you could say that's relatively unusual today.

Perhaps unsurprisingly given this clear, long term interest in what amount to ecocentric value systems, John is able to articulate a coherent and well considered world view. For the majority of interviewees, while such values tended not to be something they were uncomfortable with, most had difficulty expressing them, which limited responses to rather short and superficial ones. In contrast John spent a large part of the interview explaining his value system, and would clearly have been able to spend much longer, had time permitted.

Despite his opposition to much of what modern science has produced, John is not anti-science. He believes that science can never be complete, and is only one restricted way of knowing, and that given a recognition of these limitations, science can be extremely valuable:

That's where it gets muddled, that's scientists putting values on stuff and forgetting that they are doing that, there's nothing wrong with measurement as long as you understand the place of measurement [...] And I think what science has to jettison is the belief that it understands everything, or probably ever can understand everything. Um, I think understanding comes from a different level, it comes from being. Actually, it doesn't measuring anything at all. And... and... but science is a servant of the observations which one has um, when one is in a state of, a good, I don't know how to put it, but I think people when they are really functioning well have insights and observations and can reach levels of understanding which have a truth about them. [...] The measurement is like illuminating the truth of what we understand intuitively. So that when you have something that you think, you know, the man on the platform of the bus thinks "Well you can't feed cows to cows I mean it is against nature isn't it you know what I mean"? And the man on the platform of the bus says that, well of course he is right. Well, you know, 50 years later or a 100 years later science will validate that but the man on the platform of the bus can be right a 100 years before science gets there, and you have to, you won't have to recognise that because the power science to illuminate his intuition isn't there, or might not be there today. So I think we have to rely on a different balance and understanding

between the role of science, which shouldn't be jettisoned, and the importance of functioning at another level, [...]

He believes that a realisation of the limits of science is starting to appear within the scientific community, but is being stifled by a variety of factors:

It's interesting though that it is kind of systems thinking, which is the manifestation, if you like, which science can relate to, is starting to gain ground very rapidly, more holistically, and it is starting to permeate into sort of scientific circles, and they find it very uncomfortable. But actually if you start digging you find that it actually gets back to simply, profound, philosophical stuff, which then bridges back into even deeper things again. I mean, I think that this is very disturbing to scientists at the moment because scientists are you know, evidence, they think that they are evidence driven. They think that they can only do something if they can rationalise it, and justify it and, find empirical research which shows whatever it is that they think is true. But in fact most science isn't driven actually by that at all, but it is very disturbing for a scientist to admit that, and I don't think that science was ever driven by those things and.....

PQ: In a way I sympathise with a lot of the people who are pro-biotech because these sorts of arguments are saying "Well everything you have been doing for your entire career is bollocks" and that is really threatening, and actually I sympathise with them on a personal level.

John: Which means that they've got to look really deeply inside themselves, they've got to re-evaluate everything that has drove them all their lives. It's a terrible, it's a terrible shock to the system to have to do that. It's all very well for the likes of me who seem by accident to have acquired a sort of compatible value system through some sort of accident of the evolutionary process, but I'm very unusual.....

He is also acutely aware of the blocking effect of institutional inertia which he feels prevents changes which those inside the institutions would like to see made:

John: [...] But what we were up against was not actually um, trying to break down somebody who had a different view, it was much more up against a sort of corporate.....

PQ: Sort of inertia?

John: Inertia, exactly.

PQ: Yes, yes.

John: Exactly, which is the product with Brussels, which is then reinforced by Whitehall and which is a psychological thing as well as a machine thing, which is then, that something has happened, you just allow it to continue to happen, but it is just too difficult to change it. So, for instance, I mean, at one point I said you know "Actually everybody here wants to see the same radical change but it isn't going to happen". And I was thinking about it, why isn't it going to happen? Am I actually rehearsed in the meeting? Sitting there, you can just imagine the scenario, you've got the key MAFF officials saying "Well we want to completely change the agro/environment programme and about to replace the existing schemes with a new set of schemes". Um, and the conversation would go, you know, Strang or whoever it is gets in as the new Minister. Er, the conversation would go "Well actually Minister, er we wouldn't advise you to do anything that radical because what you have to realise is that government's made a financial commitment to fund the existing schemes which we don't

think are any good for the next five years and the public expenditure round is going to restrict you from introducing”.....

PQ: It's all 'Yes Minister' stuff isn't it?

John: It's totally 'Yes Minister' stuff. So the 'Yes Minister' dialogue frightens the Minister off making any changes. And the civil servants were advising him or her not to make changes, to protect their own, the status quo, because of their own stake holding in it, in various complicated ways. So it is always safe, safe options, you know, and ultimately what it means is perpetuating what exists, however bad it is, [...]

Although John's views are uncompromising, and are at odds with the dominant paradigm, he is able to maintain dialogue with his opponents because the food industry are obliged to enter into dialogue with John on his own terms because their need for Organic certification.

John: [...] we aren't some sort of NGO jumping up at the back of the room with a placard.....

PQ: Because you certify things that they sell...

John:certifying them, the fastest growth area in their market and they have had a relationship with us for a decade and their solutions are limited. We are not interested in just upping the ante and saying "Bastards" you know, that's never been our position, so when we ask these kind of questions they know that we are not just asking them to get, you know, that kind of reaction out of them. So we've got several strengths which we are aware of when we go into this battle, we are going in as the position of marketing boys, we can speak their corporate language and of someone else, we are probably part of their culture.....

PQ: Yes, yes.

John:and they are also very interested, because they know that the consumers are coming towards us and we haven't got this anti-reputation.

Thus in many respects, John provided what might intuitively be expected from someone in his position. Its use in this thesis is to show that a Naess style ecophilosophical world view is possible, and the values from which it stems. It is possible however that in John's case Naess's theories perform a more active role than simply a description of observable phenomena. Naess himself and his followers write extensively in publications aimed at non-academic environmentalists, and so it is possible that John is aware of Naess's work. It is interesting to speculate whether the arguments John presents in this material are derived from a reading of Naess's work, but such speculation cannot be resolved from the material collected.

This interview also demonstrates that such a world view is not confined to marginalised individuals - John functions effectively within the business community, and his lifestyle, while perhaps unusual in some respects does not

isolate him from the anthropocentric society in which he lives. In essence, John illustrates ecocentrism as a practical philosophy for living.

5.5.2 Case Study : Anne

Anne is a geneticist working within the NGO community, and has been a frequent critical voice in the scientific debate surrounding genetic modification. She is passionate about the experimental laboratory work she left behind when she became involved with various NGOs, but her disillusionment with what she perceived as the corporate domination of the research agenda, and her concern that genetic modification of food crops was being commercialised too soon and on the basis of 'unsound science', left her unable to continue with it.

The interview took place in a crowded London pub over lunch, with Sarah, a colleague of Anne's.

As a geneticist she is not opposed to genetic modification as a technique, and indeed sees great potential for it, particularly in clinical applications:

And it's a situation also where... erm, nobody will take responsibility at the end of the day. If something goes wrong, which is bound to go wrong over time, nobody will pay for it and can't be recalled either. I mean, you couldn't have just said "Oh we will undo it" because you can't. So therefore if we think genetic engineering is a method, valid to produce food or to alter plants this will still be a good method in ten years time when we know more about it, so what's the rush now? And this is why I'm putting my foot basically on the brake and saying "It's absolutely too risky and especially if there's no need whatsoever." Genetic engineering for genetic diseases, that's different. The risk is going to be taken by the individual who will have the treatment and that's a life threatening situation of things, so if you apply gene therapy, that's very different.

Anne uses arguments which extend beyond the technical details of genetic modification to encompass the political, commercial and social environment in which genetic modification takes place:

There's poverty everywhere and poverty will not be solved by genetic engineering. If they could prove.... erm, that it will alter... erm, the poverty structures and everybody will be well-off, well then talk to me, then I might speak up for it [...]

While she does not reject the potential for the technology to be beneficial, she feels that the circumstances in which it is being applied make this unlikely. Throughout the interview, the importance of profit as a driving force behind genetic modification is mentioned:

[Anne is talking about a meeting between a biotech company and NGOs] [...] they would come with a scientific argument and a lot of people would say “Oh we can’t reply there”. But fortunately I am a scientist myself and can say “Well actually I can respond to that” and I have the opposite opinion and have got the facts which support the other side. So it boils down to opinion: which scientist’s view do you believe in and whose view will actually benefit the profit because this is the one which will be heard the loudest because they’ll be the ones challenged, er not challenged, channelled [...]

She blames this for the lack of long term and basic research which she believes would lead to a greater understanding of genetic modification and thus greater safety in its application. She also mourns the loss of the freedom to discuss research with fellow geneticists, who are bound by commercial secrecy and the search for patents:

[...] I decided quite long ago that I would not work for industry because friends of mine who started working for industry all of a sudden couldn’t talk about the science anymore, what they were researching into. I said “Oh come on, what is it, is it exciting, what’s happening?” And they said “Can’t say, it’s to do with.... erm...” and they would change to something very irrelevant to it, so obviously they couldn’t speak about it anymore. I said “How do you know that that is safe or not?” and they said “Well I can’t, I talk within my department”

As a participant in the debate, Anne has found it expedient to use human centred, instrumental arguments to criticise genetic modification of food. However, when questioned about whether her personal views went beyond these to more ecocentric ideas, she was quick to articulate many of the limitations of anthropocentrism, and appeared to have a strong personal ecocentrism. However, she clearly felt that there was no outlet for these ideas in the debate as she had experienced it:

Well I feel that most of the arguments needed today in order to convince as they need to talk... they need to speak to the people, that’s why we select them. Erm... I personally do not see why humans have a higher value than the whales or why they should sort of have more right to food than birds.

Anne makes an interesting contrast to John. Although their world views are similar, for John the structure of that world view is uppermost in his mind, and his actions seem to be derived very much from 'first principles'. Anne however does not seem to link her everyday professional activities in a conscious way to her values, and the initial difficulty she has in talking about these values rather than the anthropocentric arguments she uses professionally illustrates the point. Despite this, the link clearly exists, although it is not possible to tell from the interview material whether it was this link which *caused* her defection to the NGO community.

The importance of this case study is that it illustrates that ecocentrism need not be confined to those individuals like John who explicitly derive their lifestyles from their values, but can exist in an equally consistent, if less developed form in other individuals.

5.5.3 Case Study: Robert

Robert is a senior spokesman for the Natural Law Party, and the interview took place over lunch at one of their centres, Mentmore Towers in Buckinghamshire. It was not possible to tape record this interview, so no quotations are given.

The stance of the Natural Law Party on genetically modified food is a logical derivation of their beliefs, which Robert was able to explain in eloquently. The detail of this logical structure is rather beyond the scope of this thesis, located as it is outside the variants of environmental thought discussed in the theoretical chapters. However, its logical consistency is a model application of Naess's methodology for creating normative structures, and during the interview, it was apparent that Robert was able to move between values and actions while still maintaining this consistency. The ease with which he was able to do this indicated that this was not a process he was struggling through following my prompting in the interview, but one which he had thought through in detail, and which was highly relevant to him.

The Natural Law Party are unusual within the debate surrounding genetically modified food, in that they are not involved in the food industry, nor are they an environmental or consumer group. However, during the period of the fieldwork, their supporters were perceived by interviewees representing food retailers to be the most vocal opponents of genetically modified food. Their standing within the wider debate is unusual, in that to a large extent they do not fit with any of the established 'camps'. Interviewees from industry tended to find environmental NGOs irritating, but were able to understand their perspective, and, albeit grudgingly concede some credibility to them. The Natural Law Party however is looked upon by other interviewees, with a mixture of amusement, incomprehension and irritation, and is perceived (negatively) as a 'cult'. The Natural Law Party is aware of this, and Robert explains how they do not use their normative structure publicly to defend their case, although it remains its philosophical underpinning, but use conventional science. This is rationalised by Robert to be the only arguments which will be listened to, both within the 'expert' debate and by the wider public, while still adequate to achieve their goal of a ban on genetic modification in agriculture. To this end, they have recruited sympathetic scientists to advise them, from which they have developed a well researched, logically consistent scientific argument which stands apart from, but complements their normative structure.

Whether or not Robert's philosophy can be interpreted to be ecocentrist is problematic without a thorough review of the literature published by the Party, but pervading Robert's explanation of their normative structure was the idea of the sacredness of and respect for nature, which I felt at the time of the interview to be profoundly ecocentric.

Robert makes a useful comparison to Henry (section 5.6.2) who derives anthropocentric values from a religious basis. He also illustrates Naess's contention that an ecocentric world view can be derived from many starting points, and along with Anne, helps demonstrate that ecocentrism need not arise from as explicit an environmentalist agenda as John's.

The notoriety of the Natural Law Party among retailers meant that they were invariably mentioned by them as a source of irritation:

Brian: [...] but when you're dealing with people like Greenpeace, erm, when you're dealing with people like Natural Law Party, lets get it right, I don't mind dealing with Greenpeace, they're all right. They know what they're about, and they don't lie¹. When you're talking about the Natural Law Party, who are actually... they're almost off the end of the scale, erm...

Brian: But they've already made up their minds, and whatever I write back to them, I'm not going to change their minds. So I don't see it as my job to try and change their minds, or influence them. Because I'm not going to succeed.

Brian's comments about the intransigence of Natural Law Party members, which understandably irritates him is a function of their world view. Genetic modification as a purely technical issue, as it is for Brian, is something which can be negotiated and discussed, particularly in the light of new technical information. However, for Robert to compromise on his stance against genetic modification, he must also compromise the beliefs which led to that stance, but these are beliefs which are so important to Robert, changing them will not come about following a discussion with a food retailer, if ever. For Robert the technical issues so important to Brian are almost irrelevant; any relevance they may have is tactical rather than intrinsic, whereas for Brian, the metaphysical issues so important to Robert are irrelevant. This clash of two world views illustrates Naess's distinction between the *deep* and the *shallow*.

¹ This is a reference to Tryptophan, a Japanese produced food supplement which, following a change of manufacturing process to introduce the use of genetically modified bacteria, killed 31 US consumers, and injured more than 1000 others. The official FDA enquiry ruled that the genetic modification had not caused the deaths and injuries; it was a lapse in more general food safety precautions. However, the circumstances of the enquiry were problematic, with key evidence for the enquiry being destroyed shortly before it was needed, making proof that genetic modification was the cause of the problem impossible to find. Opponents of genetic engineering have interpreted this to mean that the producers of Tryptophan wished to hide the cause of the contamination, and that in the absence of evidence, the FDA ruling reflected their desire to promote genetic engineering. In the absence of evidence, no definitive conclusion is possible, but it is clear that this source of conflict between retailers and the Natural Law Party arises from different interpretations of the same information, rather than either side lying. See Westra 1998 p. 82 for more detailed coverage of this issue.

5.5.4 Case Study: Mark

Mark owns and manages a small chain long of long established health food shops. This sector is characterised by small owner managed outlets, so it was not possible to select, as was done for mainstream retailers, market leaders. Mark was approached because, on the basis of customer information leaflets in his shops, he clearly felt the issue of GM food was important enough to warrant his attention, and because the business was set up at a time when such outlets were very unusual. The interview took place in Mark's office at one of his shops.

Mark, in contrast to John did not use ecocentric values initially to explain why he had embarked on his career. This derived more from Mark's involvement in the hippy movement of the late 1960s, which he describes more in terms of rebellion against his parents and society in general than he does in values based terms. Talking more specifically about why he chose the wholefood trade rather than other avenues to express his rebellion, he emphasises the nutritional rather than ecological aspects of the products he sells. This is perhaps not surprising given that the selling of wholefoods does not differ from conventional food in its environmental impact; it is only when organic food is introduced, a vegetarian agenda pursued, or local suppliers sought that a meaningful ecological effect can be claimed.

Mark's perception of his relationship to mainstream food retailing has changed since he started his business. Originally both the business and his customers were very much outside the mainstream, but now he feels the benefits of wholefoods are so widely accepted that his customer base has become much more conventional, and indeed the shop seems to sell a lot of sandwiches and the like to local office workers. While he continues to see an important distinction between himself and mainstream retailers, it is a distinction which is becoming increasingly blurred as supermarkets stock more organic and wholefood products.

Mark: [...] erm 25 years ago I developed a personal interest in wholefoods and a wholefood way of life, organic farming and things. Actually it was more than that, it was actually... I forget, 28 years ago, erm, I was a classic hippy dropout from University, and my way was going back to the land, becoming involved with organic farming, foods. I went off to the States at the time, got involved that way. Then I came across the new, emerging natural food trade

there, just young people setting up what we now call wholefood stores here, and organic farming, it was just such an eye opener for me at the time, where I was at personally.

PQ: It was quite underground wasn't it, at the time.

Mark: Yes, yeah. It was very much alternative, shall we say. It was very much a conscious erm, we were quite conscious of the fact we were setting up an alternative approach to living. And that was part of the statement we were making at that time, doing something that was different and opposite to the establishment, to our parents, to the way we were educated and so on.

PQ: Yes.

Mark: It was very much a statement in that way. I don't know if that's a major type statement, but radical in the sense of going back to the origin of things. So it was very much a lifestyle commitment. And that lifestyle commitment then translated for me into running a business. I came back here to the UK after a couple of years, in the early 70s, and started one of the early wholefood companies, both a manufacturer and distributor.

PQ: Yes.

Mark: I later got involved in retailing in the early 80s when the store got going.

PQ: Yes.

Mark: Erm, then it was still very much we were offering a wholefood alternative to the regular food trade, to the supermarkets. It was very much an us and them type situation.

PQ: Yes.

Mark: Because the supermarkets were not selling wholemeal bread at the time. They were not selling sugar-free foods at the time. Now they are, through the emerging wholefood trade, it's popularity, these foods have become mainstream, so we're in a very different position than we were sort of 20 years ago. Very much the pioneering thing. But nevertheless, the origin was a personal interest conviction [??]. And people who walked through the front door of the shop generally were converted in terms of their personal ideology.

PQ: Uh-huh. So you were pretty much preaching to the converted.

Mark: Yeah. Yeah. I mean we're in a very different situation nowadays. Wholefoods is very much now... the wholefood nutritional approach is very much accepted in the mainstream, and the hazards of too much fat and too much sugar and so on are now very widely accepted through the medical nutritional food trade.

Mark: Erm, so our customers [now] are quite wide ranging, I mean being here [location], our prime customers are actually office workers. Not necessarily coming in with any ideology in their heads about wholefood, they just want something that tastes good for lunch.

Mark has already hinted at values when he speaks of the ideology of his customers, but in the following passage he expands upon this by drawing on a distinction he makes between his reasons for stocking the products he does, and those of the mainstream retailers. Although he uses the term ideology rather than values, this passage is unambiguous in linking Mark's values with his professional activity, although he does not give any detail at this stage what those values might be.

PQ: My perception is that the supermarkets still deal with it [wholefoods] very differently to the way that you deal with it.

Mark: Oh yes, yes, yes. My observation is that they deal in an extremely pragmatic way, solely a pragmatic way about such issues, and if an issue comes up they say we'll find out what our customers want, we can give them what they want, and they're just led by statistical information which comes back from the customers. That's my observation.

PQ: Yes.

Mark: Whereas the position we've taken has been a lot less pragmatic, a lot more sort of idealistic. In a rather arrogant way, we said, this is what we feel is right, we feel there are certain health hazards with certain foods. You know, wholefoods have a certain nutritional advantage over refined foods, therefore we will focus on selling wholefoods which are not generally available. So it's come from an ideological position, and that still is with us here, although we're a lot more flexible than we were years ago. We will... we aim to have an extremely wide range of organic foods for example, there's... the large multiple stores have a very limited range.

Discussing GM food more specifically, Mark's first statement of anger clearly indicates his strength of feeling for the subject, but the reasons he gives initially for this are based around labelling rather than the existence of the food itself:

PQ: So, on the subject of genetically modified food, I mean it's the Soya bean particularly, I picked up one of your blue information brochures that you've put out. What's actually driven the publicity that you've put out for that? Are you opposed to the technology, do you just feel that your customers should be aware of it, what drives that?

Mark: I personally feel quite angry that there isn't proper labelling of genetically modified foods. It's my personal view.

PQ: Right.

Mark: And it's the view of our staff here, and it's the view apparently of a lot of our customers. And I feel that I need to actually communicate the issue to customers. I would like to be able to spend more time doing it, but with the nature of running a business, it's done in a rather haphazard way.

Looking in more depth at the reasons for his hostility to GM food, Mark is quick to volunteer a distinction between his professional and personal stances, although he considers the two to be very close:

PQ: Can I take it from that then, that were genetically modified food of all descriptions fully labelled and segregated, would the issue then go away as far as you're concerned?

Mark: Erm, well, there's two levels I can talk and I can talk from my personal point of view, and from the business point of view.

PQ: I'd appreciate both, actually.

Mark: OK

PQ: I'm interested in how one drives the other, or not as the case may be.

Mark: Sure, sure. I'll make a distinction on that, because it's.... I am aware of what my own personal choices are, my personal feelings are, and also that I need to act professionally in running a business. Not that there's a wide divergence, but it needs to make, in some cases a distinction. [...]

He continues by talking at length about activity within the wholefood industry aimed at removing, or keeping out GM food, based around notions of choice, a

position which echoes his earlier comments about the business's increased flexibility over its 'ideological stance'. He also expresses sympathy for the concerns of the public, which he feels are reasonable.

When elaborating on his personal feelings on the issue, he states a firm commitment to the eating of organic food, and a rejection of GM food, although at this stage he does not elaborate on why this is so:

Mark: I mean from a personal point of view, I eat organic foods, and it's my intention to continue to do that.

PQ: Yes.

Mark: I'm not interested in eating genetically modified foods. They don't have any benefit or advantage for me. Erm....

Mark is enthusiastic in his support for notions of ecocentrism, which tie in with his earlier comments about his preference for organic food. I had some difficulty explaining the concept - intrinsic value was clearly not a term he would himself have used, but once this difficulty was overcome, the final statement in this passage makes it clear that his ecocentrism is both long held and of importance to him.

PQ: There are other things in the environment like... I don't know, giant pandas in China, which probably have no benefit to us at all, other than perhaps an aesthetic benefit, but ignoring that for a while, they don't actually have any benefit for us at all. Any kind of practical benefit. Or the integrity of ecosystems in Antarctica, which probably don't have any impact on the global environment whether they were there or not wouldn't actually make any difference to us.

Mark: Yes.

PQ: But some environmentalists argue that things like that have an intrinsic value beyond what might use them for.

Mark: Ah, right.

PQ: Would you sympathise with that?

Mark: Oh, definitely, yes. Definitely, yes. Part of my holistic philosophy is that we can't separate ourselves from other organisms and life forms, energy systems, we're all part of that.

Mark continues by explaining how the expression of his views have mellowed over the years, particularly acknowledging the importance of his family commitments, but tempers this mellowing by stating that he feels his ecocentric views have become far more socially acceptable than they were in his youth, the implication being that the degree of compromise required of him is reduced:

Mark: [...] I suppose I'm feeling nowadays that there's very few people I find it difficult to talk with about what my view is.

PQ: Yes.

Mark: At first it was the other way round. But at the same time, I've probably learned to be a lot more flexible and, pragmatism has come in, whereas I used to back myself into a ideological corner.

PQ: Well, it is easily done isn't it.

Mark: Yes.

PQ: But running a business you have to...

Mark: Well, having a family to support, having a business, having responsibility for others apart from myself you know, for my family and for my staff, the customers and so on, I'm not... I can't be totally selfish.

This section of the interview concludes with a discussion of the linkages between Mark's work and his values. These linkages are clearly very strong, and of great significance to Mark, who has deliberately set out to create them:

Mark: I suppose the values that I've talked about are values that drive me in my life, and actually being my livelihood, I mean I've had a personal philosophy to try to find.... try to integrate my beliefs with my need to earn money and make a living. I try to integrate those.

PQ: Do you think you've been reasonably successful?

Mark: I feel reasonably successful I suppose, yes. I do feel, I feel fortunate you know that I have... that I am in essence able to support myself, my family in reasonable comfort and maintain my beliefs in terms of what I do. In that sense, you know, my work is my pleasure and my fun as well.

PQ: It's quite unusual these days.

Mark: I need a break obviously, and I like to get out of my basement in [location of shop] and go to where I live in [location of Mark's rural home] and do some gardening or something, and then I can get that sort of balance.

PQ: Yes.

Mark: I feel... I get as much nourishment out of what I do here at work as I do from other things in my life. But that has been a clear aim, a philosophy I've sought to do.

There is little difficulty therefore locating Mark as an ecocentrist. While he may have compromised his beliefs to a limited extent in order to provide for his family in an anthropocentric environment, his ecocentric values are clear, as are their use as a driving force for much of his professional activity. Mark shares much common ground with John, which is perhaps not surprising given their shared involvement with organic food.

5.5.5 Case Study: Carol

Carol is a board member of a major UK food retailer which has taken a strong stance against GM food. The interview took place in the bar of a London hotel.

Carol's employer's stance against genetically modified food, which was unusual at the time the interview took place was generating interest both from the media and the industry as a whole. As a result, this was the first topic for discussion. The company's more general, proactive stance on environmental issues has been brought about primarily by the company chairman, to whom I have allocated the pseudonym Tom, since although he was not present at the interview, is an important actor throughout.

Their stance on GM food is derived from what Carol terms 'common sense', and although her company takes expert scientific advice, she does not feel that it is science which draws attention to this and other environmental issues as ones which they can take action on. Carol tries to take a lay perspective on the issue, which she seems to see as a way of standing in as a proxy for her customers who perhaps are not yet aware of GM food as an issue, don't have the time to deal with it, or where there is insufficient time to ask them directly. This lay perspective does not replace the customer research they and all other retailers undertake; Carol seems to view such research as limited, and uses a lay perspective to complement it.

Her company therefore seems to take a strongly value-driven stance, at least on environmental issues, and the link between values and professional action is clearly of importance to both Carol and Tom, and it appears, the rest of the company. Her discourse on this issue, which recurs throughout the interview seems genuine; at no time does she appear to be putting forward a 'corporate line' which she is not comfortable with, or even indifferent to herself. She is also quick to point out the practical limitations of what they, as a commercial organisation can do, and the commercial benefits she feels accrue from what they do do.

Carol: [...] and he [Tom] is very much his own person, and regardless of the success of his business has really stayed true to himself. He has very strong

feelings, environmentally, morally, socially, erm, I don't suppose he's that much different to lots of other people, erm, but he doesn't sort of divorce those

PQ: Mmm

Carol: Now if it's your own company, it's much easier of course to embed your own feelings, and what you want to do to your company

PQ: Yes

Carol: [...] Over the years we have tackled a lot of issues, and I think we've come to it from a very common sense point of view. Whilst many of them are highlighted by Tom, some of them are not, I mean issues are sort of highlighted in all sorts of areas, and we come to things from a very common sense point of view. Is this right, or is this not, without necessarily understanding the science, or too much of the background, looking at it in a way, as most people look at issues, you know, read a few inches in the newspaper, or see something on television. You haven't spent years studying a subject, you really are not that informed as such, but sometimes, a common sense feel can actually get to the nub of the problem, erm, you know, without the science or the theories getting in the way.

PQ: Yes.

Carol: So..

PQ: Is that a pragmatic view, or is it because you're trying to reflect what your customers might say....

Carol: It is very much what we believe our customers want, but I think yes we are approaching it from the customers' viewpoint. [...] we have highlighted problems in the past where we think; this isn't right, from a common sense point of view this isn't right, we know that our customers wouldn't like it either. Therefore we decide well shall we take this issue high profile, should [company name] sort of jump on this and make a statement about it. And we do that for two very clear reasons. (A) because we believe that what we're doing is right, we believe that we reflect our customers' views, and I'll go on to how do we know it's going to reflect our customers' views in a minute. But secondly we know it will be good publicity for the company.

Carol: [...] we have in the past done customer surveys, and said to people, well how... what **do** you think about this issue, and would you perhaps like [us] to campaign on your behalf, we have done that, and we would continue to do that, but sometimes, it takes quite a long time, and sometimes you have to jump on an issue now, because if you take time out to do research with your customers it could take quite a long time. [...]

Carol: [talking about the feeding of meat derivatives to cows which brought about BSE] It's wrong. It is basically wrong. And the scientists could spend years trying to persuade you that it was right, but at the end of the day, I think, you know, most people's gut feeling would say, whatever you say, I'm sorry, I don't want to know, I don't... This is really why we have taken a stand on genetically modified food. And I have had to do a quick sort of learning process to really understand what it's about. But it's interesting how it's come about because immediately we saw that this was an issue, and this was a problem. And we decided that we were going to go high profile on it. And then we've gone backwards to actually understand what it's all about.

PQ: Yes.

Carol: So I have actually spoken to so called experts, from both sides, to try and understand what the situation is. It has just, it has clarified our thinking, totally, and made us realise that we were absolutely right in what we're doing. So, I think our company therefore, just to.. sort of, why do we get involved with these things, it is very much about being led, by an entrepreneur who has very clear views about right and wrong, and particularly about environmental issues, erm

The next section of the interview was a lengthy discussion of various environmental and social projects Carol's company have been involved with over the years, all of which show the same mixture of commercial and ethical motivations they have adopted with GM food.

Discussing some of the wider issues surrounding GM food, specifically its place in the continuing project of industrial agriculture, and the possibility of alternatives, Carol describes their efforts to stock organic vegetables, which was based on their view that they were superior both for human health and the environment. This passage also reveals a further ethical dimension to their activities. Rather than simply respond to expressed customer wants (see interviews with other major retailers), they seek to make their customers aware of issues which they think are of importance. This process requires an ethical decision on the part of the company, whereas responding to the customers agenda shifts the ethical responsibility to them.

Carol: [...] We'd love to sell a range of organic vegetables, erm, I think if we take vegetables, we, in the very early days, and we're going back five or six years now, erm, had..... I mean, when organic vegetables were actually... you know, there were a few on the market, we were so excited about that, we thought that was brilliant. Lets [sell] organic vegetables.

PQ: Uh-huh

Carol: So we brought them in, had a range, and they didn't sell.

PQ: All the supermarkets are saying the same.

Carol: Yeah. And we had more of a problem than the other supermarkets, because our customer profile is much C1 to D, Z, whereas Tesco and Sainsbury will get the ABs. We don't have many ABs shopping in our shops. We're very much in the lower socio-economic groups, who don't.... and this is why and you may say, are you choosing the right issues to fight on behalf of our customers, because some of the issues we do fight for environmentally, many of our customers aren't particularly interested in. Erm we want to make them interested, that is our role. So, on the organic veg front, erm, they were there, clearly labelled, clearly saying you know no pesticides, good for you etc., er but they were more expensive. We took a lesser profit margin on them, but even so, they were more expensive. And they just didn't sell. You can only stick with products for so long.

Expanding further upon this theme, the success of organic vegetable box schemes² in contrast to the difficulties conventional retailers were having at the time selling organic produce was discussed, which produced an enthusiastic

² Organic vegetable box schemes are regular deliveries of seasonal, usually locally grown produce. They are often run as co-operatives, and seek not only to supply organic produce, but to create a closer relationship between farmers and urban dwellers, and to bypass supermarkets, which they tend to consider unsatisfactory for a variety of reasons which are beyond the scope of this thesis.

endorsement of the connectedness to nature she feels as a result of growing her own vegetables.

PQ: [talking about organic vegetable box schemes] what I like about the delivery that I get is that you're not given a choice, they say we get these vegetables from local farmers, and you just get what's in season.

Carol: Yes

PQ: And I do like that connectedness really that... that is missing when you go to the supermarket, with all the products are just very....

Carol: Oh I know. I mean... personally I think that's wonderful, I mean we actually grow all our own vegetables, so we don't have.... But as happened last Sunday, we had a lot of people round for lunch, I don't actually say, well what are we going to have, I actually say well what have I got in the garden that they can eat.

Turning to more abstract notion of environmental values, Carol speaks at length about her alarm at humanity's increasing, and she feels, excessive influence over and damage to nature. Again, the notion of connectedness to nature is mentioned, clearly an idea which is important to Carol, and which echoes Naess's concept of Self Realisation, and thus points towards Carol's ecocentrism.

PQ: A very general question. You clearly do have environmental values, everything that you've said to me underlines that.

Carol: Mmm

PQ: But on quite an abstract level, how would you articulate those.

Carol: Erm....

PQ: Forgetting about [your company] for a moment.

Carol: Yes..... what, talking about me?

PQ: Yes, we were talking earlier about changes in agriculture, not using pesticides, which you obviously feel quite strongly about, now why do you think that's important?

Carol: I... think it's important because if we all carry on at the pace at which we have introduced pesticides, herbicides etcetera, and this applies to everything, it applies to the way we treat animals and everything...

PQ: Mmm

Carol: Where is it all going to end? Because it will all become one big production unit, and we will actually be creating food that suits us as human beings, and we will have lost this interaction with nature. I mean, it frightens me that human beings will actually... I mean they have taken over, but it frightens me, because human beings just really seemingly in the main do not know how to work with nature. I mean we are just one small part of this whole planet, and if we start to muck it up much more, we'll destroy the whole thing. I'm sure we will in the end, I mean that sounds very defeatist, but I can't see that man is ever going to step back and understand the issues to quite the extent to which I think they should. [Carol then continues at length about her hostility to battery farming and other aspects of industrial agriculture which she considers to be unnatural]

Carol is emphatic about her support for ecocentric ideas. When questioned directly about notions of intrinsic value, she has no difficulty with the concept at all, and is able to speak eloquently and at length about what the concept means to

her. The extent to which humanity should intervene in order to make good damage already done is also something to which she has given considerable thought, and has evidently wrestled with the conflict between this and her wish to leave nature alone.

PQ: Do you think that nature, the natural world has intrinsic value, or do you think it's reasonable to say that its value lies in its use for us?

Carol: No, its got intrinsic value. I don't see why it should be there for our use. In fact I would be totally opposed to that. I just think humans.... I mean if there weren't any human beings on this earth it would be a much better place, I'm a great believer in that. I think we are.... well we are the ones that will destroy it. Erm, I mean no other animal or plant that I am aware of erm.. you know can't live in the natural world, and make it's way in the natural world, without destroying it as it goes along. And we just have this obsession with making nature suit what we want, rather than the other way round.

PQ: Yes

Carol: But I do understand that it's difficult to sort of move backwards in time, I mean for instance my husband goes out shooting, so he shoots pheasants, partridges whatever, and I take great delight in eating them I have to say. So I'm saying how can we do this, he's interfering with nature. Erm, but in many ways that's quite natural, we have to eat, and we could all be vegetarians, but we're not, erm, and I think that we were meant to eat meat. They actually put down all their birds to shoot. That's quite extraordinary, but anyway, I mean they rear all these things, they spend hours and days rearing all these things to go out and shoot them. That's what they want to do. so in many ways that is a natural process. They shouldn't have to put them down because they should be here naturally, But you know, hedgerows have gone and its.... So sometimes there are difficult arguments. They will convince me that they are conservationists, and I have been convinced. It took a long time, but I have been convinced. It's a difficult argument. They will shoot rabbits and squirrels and they.. that's probably the greatest conservationist that I know yesterday, and she was actually out with her gun shooting squirrels. I mean I said what are you doing?

PQ: Grey squirrels are an alien species

Carol: They've taken over she said, They're ruining my forest. So in some ways man has taken things so far, we feel we have to interfere now to keep this balance. So that is actually very difficult. But we're nowhere near facing those issues, I mean if those were the issues we had to face that would be all right, it's how do we halt this progress where man is destroying the world?

Locating Carol as an ecocentrist in the context of this thesis is relatively unproblematic. On a fundamental level, she clearly has strong ecocentric sympathies, and these are used to inform her professional activities. Her ability to do this has evidently been helped by Tom, the company chairman, who presumably could also be similarly categorised, but it is a process for which she has evident enthusiasm. Carol's practical ecocentrism is tempered by the situation in which she finds herself; the need to run a profit-making food retailer, and to live in an anthropocentric society, and these compromises are perhaps

greater than for John, Mark and Robert. However, the link between values and professional action remains, and is powerful.

5.5.6 Case Study: Mike

Mike works as a scientific advisor to a prominent NGO, and has been involved with their campaign against GM food. The interview took place in a park near his office.

Mike trained as a geologist, but this included aspects of the philosophy of science, which led to an interest not just in the technical detail of his specialism, but its context and wider validity. This led to a paradoxical situation where Mike was working for an oil company while campaigning on environmental issues at the same time:

PQ: I get the impression talking to you though, that the values that you have drive very much what you do professionally - is that fair to say?

Mike: yeah, I took a conscious decision to stop working for an oil company , err, and do something which I could believe in for that very reason.

I felt that there was an increasing sort of schizophrenia between what I was actually putting my energy in to in my spare time which was various sorts of campaigning and what I was doing to earn my living. I was fortunate enough to be able to change that, but I still regard myself as fortunate otherwise.

Mike bridged the chasm between his professional work and his beliefs by working for an NGO, and subsequently the NGO he now works for. This is a step he feels privileged to have been able to make, and feels that it is a sad reflection on society that such a step is so unusual:

I have also certainly since I have been working in a job where I can do what I am believing in, I have felt very privileged to be doing those things, interesting in itself, that our society should be such that to be doing something that you can actually be paid for and believe in, is regarded as - at least I would regard that as being an exception rather than the rule, I mean I feel very privileged to be in that situation and I don't take it lightly that I'm fortunate enough to be in there. [...] and I think you know that it's a remarkable comment in itself on the nature of our society that so many people feel they have to compromise their values.

Evidently, values are an important issue for Mike, and throughout the interview, he came across as a thoughtful individual. However, when asked specifically

about ecocentric values, it is clear that he hasn't given the idea much thought. His speech changes at this point from being quite fast, with few hesitations to being very faltering with long pauses. He begins by criticising the concept of ecocentrism with reference to what Dobson terms weak anthropocentrism (see chapter two), but then talks about why he cares for species which have no benefit for him. However, he struggles to articulate why he feels that way.

PQ: Do you think it goes beyond the sort of human centred arguments - do you think it has value in itself?

Mike: In - umm - in terms of absolute value on biodiversity?

PQ: I don't know whether absolute value ...this implies pounds and pennies doesn't it? but

Mike: I'm just trying to get my head around the question you are asking, that's all. Just, I mean, there's....

PQ: You've explained biodiversity up until now as being important because humanity could benefit from it, do you think -

Mike: The thing is the question of importance is a human centred question, the questioner has to re-assess the importance from a human perspective. I suppose if you wanted... I suppose all I can think of is a sort of blue whale value kind of thing. You know that people feel there should be blue whales, even though they personally don't benefit, nor ever see one. - umm.

PQ: Similarly with Antarctica and all the other -

Mike: yes, and people do care about those things, exactly why nobody can show

PQ: Are you bothered about it?

Mike: I care about diversity of animals which I will never get to see in places that I will never get to visit, but if you ask me why, I will probably have a very difficult time... but I will feel the more impoverished for feeling that some of these creatures do not survive any more.

In the following excerpt, my question expresses surprise that Mike has not given much thought to ecocentric values. He replies by locating ecocentrism at an extreme end of environmental thought, which, while it agrees with O'Riordan's typology outlined in Chapter Two, it contrasts with the evidence for the popularity of such beliefs among the general public, and with other interviewees who one would expect to have less sympathy for ecocentrism than Mike (see Chapter Six).

PQ: I'm interested at what level do you feel that you believe in [your work], because I'm quite interested that what you do seems to be quite value driven, and yet at the same time when I have asked you quite value laden questions you don't appear to have given it that much thought in the past, because there's a bit of a ... not a contradiction because you seem to be thinking about these things on a slightly different level to that - it's not as though you haven't thought about it.

Mike: I think you're asking about a particular sort of value

PQ: Yes I am

Mike: Which are .. I think it's fair to say that some of the values you asked me about are putting it on a plane which is almost the extreme end of the kind of environmental campaigning movement.

PQ: Yes, erm , yes

Mike: and so if you looked at my personal involvement with the environmental movement, I have been much more strongly involved... [the tape is turned over at this point, but Mike talks here at length about his pragmatic concerns which have led to involvement in specific environmental campaigns]

Mike rationalises his lack of thought about values by reference to his own lack of introspection, to his gender and to the educational system:

I think to some degree I would accept the criticism, and possibly I haven't thought through a lot of the things where I have values and I think I can answer it in some respect by saying that I'm not actually that introspective, I tend to know that I have a value, I don't always know where I have a value. I mean, men anyhow tend to be much worse than women knowing what their feelings are, or even admitting that they have feelings if one talks about feelings, but values can be analytical as well as emotional and my view is that we have a very, very directive educational system that drives you towards certain sorts of career and it channels you to doing certain sorts of things, and the opportunities to actually step back from them and say - "hold on, I've been doing all of these things according to the values of the system, or my peer group, or the status quo", but stepping back actually saying, what are my values? is something that there's very little opportunity to do, and for me I didn't really do that at all until I was in my mid-twenties, where I was in a situation where I thought, "hold on, I'm doing something here which I do not believe in , which I'm not prepared to be a part of and then it was a question of, what by that time was an escape route - tunnelling out, whereas a more enlightened educational system might have stopped me getting that far in the first place

The interview finishes by an expression of surprise by Mike about the material I was looking for, which confirms many of the statements he made earlier:

PQ: well, that is really what I wanted to cover.

Mike: I can't believe that is what you wanted to cover, but it was interesting anyway.

Categorising Mike as an ecocentric is fairly unproblematic, but many of his statements were unexpected. His career has been highly value driven, but at the same time those values have not been thought through particularly thoroughly, nor do they appear to be grounded in the writings of environmentalist writers, mainstream or otherwise. He claims to lack introspection, but sections of the interview, for example where he reflects on his own experience of the education system, and of science education in particular show a depth of thought which belies this claim.

5.5.7 Summary of Ecocentric Respondents.

Mark and John represent perhaps the most predictable ecocentric respondents. Their values are of such importance to them, that they have specifically set out to develop careers which are aligned with those values. This is not to say that they never act in unecocentric ways; the interviews did not probe either for details of their lifestyles, but it is almost inevitable that both, as a result of living in an anthropocentric society will not always be able to act according to their values. For example, both live in rural areas, so it is likely that they drive cars. However, a pure ecocentric lifestyle is not possible, and for this thesis, the importance of these respondents lies in the link that exists between their ecocentric values and their work. Mark and John are the closest to the lifestyle Naess has in mind when he writes about Deep Ecology. Recall also that Chapter Two presents ecocentrism as an orientation rather than a set of rigid guidelines to be inflexibly adhered to.

Anne and Mike are a somewhat different cases. While they have ecocentric values, which are reflected in the work that they now do, those values did not appear to have influenced their original choices of career, that of becoming scientists. This is mirrored by Simon, who is discussed in Chapter Six. Now, working for an NGO, the link between their values and work is clear, but it is not something either seem to use to inform their work on an everyday level. This is illustrated by the difficulty they both had talking about ecocentric values, in contrast to the ease with which they speak about their scientific and political objections to GM food.

Carol shares Anne's non-ecocentric career choice, but like Anne now has a link between her values and work. The practical value of values as against science are inverted for Carol. While she seeks scientific justification for her position, her position is primarily value driven. For Anne, the science (and the politics) are the overt driving force for her position.

Robert was a somewhat unexpected case, and much of the detail of his position is outside the scope of the thesis. However, he has the closest to a Naess style

normative structure, albeit in not quite the form envisaged by Naess. He shares with Mark and John work which is derived from his values.

This section vindicates the importance attached to the work of Arne Naess in Chapter One. While insights presented by Billig suggest that human thought is far more contradictory than Naess's methodology allows for, and that the Deep Ecologist is an unattainable 'ideal type', these interviews demonstrate that ecocentrists exist who appear to construct their worldview according to Naess's methods. However, Naess's work is very influential among radical environmentalists, and it is impossible from the data collected to ascertain whether the logical structures Mark and John presented were a spontaneous response to their situation, or whether they have read Naess and decided to follow his methods.

5.6 Anthropocentric Respondents

Boster, Kempton and Hartley uncovered individuals who had what they term anti-environmental world views, which is broadly equivalent to my category of anthropocentrists. According to them these individuals exist, but do not offer an alternative consensus to the environmentalists, but a scattering of different viewpoints. This study, focusing exclusively on the debate surrounding genetically modified food, itself framed in Chapter Three as an anthropocentric enterprise, involved a high proportion of scientists (see Chapter Four). Thus one would expect to find more of a consensus than was found in the Kempton *et al* study around anthropocentric worldviews, assuming of course that some respondents were consistently anthropocentric. This was in fact the case, with several interviewees articulating a coherent technocentrist/anthropocentrist worldview, and one respondent using anthropocentric biblical interpretations to develop a technocentric worldview.

5.6.1 Case Study: Andrew

Andrew is a senior representative of a major UK food retailer. His training was as a scientist, but he now works within the food policy field, and has done so with both his current and previous employers. The interview took place in his office at the company's headquarters.

Andrew is clearly, and perhaps inevitably, very much concerned with the pragmatic concerns of the industry in which he works, and has little time for abstract ideas concerning environmental issues:

So, our corporate philosophy if you like is one of responsibility within commercial and pragmatic.... you know, the realities of life really. And in that sense, yeah, I guess it's no different from my own. But if I had extreme views I probably wouldn't be in this job.

He is very much a believer in the dominant social paradigm, despite a good knowledge of current environmental issues. This seems to be rooted in a faith in

'progress' which he defines as a continuation of the current technological trajectory.

I think ultimately um, that sort of stance [advocacy of a ban on genetically modified food] means you are turning down an opportunity for potential in the future and it really does come back to this, you know, it's this fundamental philosophy really, do you believe in progress for mankind or not?

He dismisses other notions of progress which he considers to be impractical:

I don't have a lot of time for the very, as I said, the Garden of Eden type arguments because that doesn't address any realities as far as I can see, certainly nothing that I see in my every-day life.

This dismissal is evident probably more in what Andrew doesn't say than in what he does. Given the opportunity to expound a set of ecocentric fundamental values, seized upon by many interviewees, he dismisses the idea by making the point that wild nature has virtually disappeared:

In this country [the countryside] is totally man-made, and it does concern me sometimes, this word 'natural' is used.

Uniquely, he is explicit about rejecting the idea of environmental values:

PQ: [...] on a personal level, would you say that you have environmental values?

Andrew: Is this me or the business?

PQ: You.

Andrew: [long pause] It's a good question that.

PQ: It is a very difficult question, yeah.

Andrew: Environmental values? I'm trying to think how they manifest themselves in my day to day life. I would say not, no. I mean I would choose a car based on values other than environmental ones. Um, [inaudible] on the basis that I use unleaded petrol, and it's got a catalytic converter on it. Um, I recycle things at home, but that was because my local council made it easier for me to do so.

This very frank passage is echoed throughout the interview where Andrew demonstrates a good awareness of environmental issues, whose importance is always justified by anthropocentric, never ecocentric arguments:

[...] I would subscribe to the argument that there is a gene pool there that we mustn't destroy because we may need it in the future.

Well it [a wood visible from Andrew's office] has an aesthetic quality about it which I appreciate.

Well I think there are quality of life issues [responding to a question about whether the countryside should be preserved]

[...]the value for me would come from damage to the biosphere, I mean, if the argument is correct that it will continue to use massive amounts of pesticides then we are going to have major damage to our food supply then sustainable agriculture is one idea that we will look at and we have done.

He has a cynical attitude towards groups that oppose genetic modification:

well like Greenpeace they [the Natural Law Party] do have an opportunity to mount a campaign which again it's something that the media are taking on and off an interest in this topic and there is an opportunity for sensationalism which is um, Greenpeace and Natural Law Party will use as a tool to further their interests.

Here, Andrew appears to attribute to Greenpeace and the Natural Law Party the same instrumental motivations he and his employer have, thus implicitly dismissing the possibility of ideologically based motivations within the environmental movement.³

This ambivalence also extends to the biotech industry. Andrew and his employer have had discussions with at least two of the major biotech companies:

PQ I'm interested for example that you talked to [biotechnology company]. Now I guess you're fairly unhappy with um, the very line that they have taken on that. Um, what sort of relationship do you have with them? I mean do they just come and tell you "Well this is the way it's going to be?"

Andrew: Yeah, and we shout back at them, yeah [laugh].

PQ And so there's well there's no relationship at all?.....

Andrew: It's not a relationship.

PQ You make each other's position clear?.....

Andrew: That's it.

PQ And then go away again.

Andrew: And in fact they asked to come and see us the other day. And I said "Well have you changed, has something changed that you want to talk to us about?" He said "No" so there was no point in meeting. The relationship is not very good.

PQ [laugh] Yes. Does that apply to other similar companies people like [biotechnology company]?

Andrew: Er, [biotechnology company], yeah, I mean they can sit at the IGD and again putting a fairly arrogant and insensitive performance along the [biotechnology company] lines.

PQ Right. Why do you think they're doing that [.....]

Andrew: I think to answer your question, I think my view on [biotechnology company]'s policy on this was I think they, it's a personal guess, but they were

³ Andrew's comments about the motivations of the environmental movement contrast with those of Chris, a conflictual respondent discussed in Chapter Six

very scared by what happened with BST⁴ and were determined er, that this technology should go through and that in any case the infrastructure said the Soya beans were such that it would help support a sort of um, a policy which forced er, the technology through. I think they're also divorced from our customers quite obviously and therefore um, quite insensitive to their needs and quite naturally so, their customers are US farmers. Um, and therefore they adopted the stance that they did. How much of that is not being aware of our customer requirements and how much of it was them being concerned about the threat of BST I think is difficult to define.

PQ Yes.

Andrew: Probably a little bit of both. And I think that you know that the stakes are so high for this technology now, so much money has been invested, er, people like [biotechnology company] can't afford for it to be banned and will take whatever steps are necessary to make sure that it doesn't. Having said that in doing so they have risked a strong consumer back-lash which may or may not result in the technology failing, and I can't read that one at the moment.

However, Andrew and the biotech companies share much common ground. Both do not see their role as guarantors of safety, preferring to leave that to the regulatory authorities:

I have sympathy with, we have sympathy with their um, with their [environmental NGOs] concerns about customer choice. Um, but we can't be in the business of questioning safety when assessments have taken place on scientific grounds. There is a fundamental difference in philosophy between these organisations and let's call it the 'establishment'.

When asked about problems with consumer confidence, he appears to concede a role for retailers in safety assessments, but the example he gives concerns a scientific matter, not the concerns of his customers, whose expressed wishes are, throughout the interview, given primacy.

PQ: I was at a conference at the tail-end of last week at the Royal Society of Medicine about genetic engineering and the food production and several speakers there said that one of the problems that they have with the regulatory process is that, aside from its tangible limitations that we have already spoken about, the public don't actually have very much confidence in it after the BSE scare and so it seems to me that you could argue that for someone such as yourself, if the public, i.e. your customers are not happy with the approval procedure then perhaps you should have a look at it independently, perhaps not you individually but retailers generally?

Andrew: I go back to the strength of the feeling among our customers with the letters being 50 out of 12000.

PQ: Right, OK. Yeah, that's a fair comment.

Andrew: Otherwise, yeah, I guess you're right, we would take appropriate action. I mean we have done so when there was a dispute between the ACNFP and the EU on the ampicillin resistance in Maize, we've actually found that because in our view there was a slight doubt. But that wasn't based on safety,

⁴ BST is Bovine Somatotropin, a genetically modified hormone designed to increase milk yields in cows. Although it is used in the US, safety concerns have so far prevented its approval in Europe.

that was based on bad science which was what the ACNFP rejected as well, they said that the risks here are exceedingly small, but why risk them at all?

This restricted view of customer perceptions, as able to be expressed only through purchasing decisions and letter writing is present throughout the interview. Other ways of determining public perceptions are dismissed:

PQ: [...] you don't directly survey your customers for example? [...]

Andrew: Er, yes we have done. And the situation really is that most customers don't know about it and if they do, it really is very much, what's the term, when by doing the survey alone you influence the results, I forget the term.

PQ: No, I know what you mean.

Andrew: Um, and as soon as you say er, and if so genetic engineering and you tell them then they start to say "Oh I'm a bit concerned about that", whereas they weren't until you asked them. So there is an element of that.

Andrew considers that by providing information and choice to customers, retailers absolve themselves of responsibility for ethical and environmental aspects of the food chain. He uses an example to illustrate the probable lack of interest his customers have in genetic modification, but the same example can also be interpreted to illustrate the sanitising effect supermarkets have on perceptions of the food chain, but Andrew dismisses this argument.

Andrew: [...] I mean, you take the example of the salmon that's been developed by Aqua Bounty.

PQ: Is this the one that grows very quickly?

Andrew: It grows at 46 times the conventional rate. Now I don't know what that would deliver to our customers, but let's say smoked salmon at half its current price, so we put on the shelves smoked salmon at two different prices, one conventional, one GMO, and leave it to our customers to decide, and guess which they'd choose?

PQ: Well it's going to be the cheaper one, isn't it? Obviously. But I suppose there's always the problem, isn't there with the supermarket, it's very difficult to equate what you see on the shelves with the entire food chain. Um, so despite your best efforts to inform your customers which you, I mean you are doing, I've looked at some of the stuff that's been put out, you can't get away from this um, sanitised thing that's on the shelf which bears very little relation to the.....

Andrew: No I understand that.

PQ: And so, I think, there is a certain danger in relying on customer choice within the shop because it's extremely difficult for them to actually take on board all the issues which if they did take them on board they'd perhaps would buy things differently. I mean, particularly that might be the case with meat and animal welfare.

Andrew: Well as I say we do try and inform customers and, but at the end of the day they're either interested or they're not. And if they're not interested it's our business to try and give them their stock items to try and give them information but if they're not actually intrinsically interested then I'm not sure where there is an awful lot more we can or should do to make them interested. That's for Greenpeace and so on.

On the wider safety aspects of genetically modified food, particularly long term and environmental considerations, Andrew sees a potential role for his company in that he considers they would not support an environmentally damaging technology. However, this is countered by a lack of awareness of the work of key scientific critics, accompanied by a knowledge of the arguments put forward by the biotech industry.

Andrew can be located quite unambiguously in the anthropocentrist category. While many of his statements are a necessary part of his professional role - it is his job to say them, unlike other respondents who perhaps feel compelled to state their employer's position, throughout the interview Andrew remains remarkably consistent, always reflecting the anthropocentrism of his employers in his responses to questions about his values. While it is possible that he grasped the project's agenda, and tailored even his statements about his personal values to achieve this consistency, this seems unlikely given his background, his interpretation of the motivations of the environmental movement, and my distinct impression during the interview that he was responding honestly. Other interviewees in a similar professional position to Andrew seemed to be trying to adapt their responses to the expectations of their employers, but not being sure how to do this on such unfamiliar territory, resulting in contradictory and/or clumsy responses. Andrew exhibited none of this, which I interpreted to mean that his responses could be taken at face value.

5.6.2 Case Study: Henry

Henry is a semi-retired senior academic geneticist who works within the Advisory Committee Structure, and is a frequent spokesman in the media and elsewhere on genetically modified food. The interview took place in the restaurant of his London club.

Henry sees his role as very much that of a public servant, safeguarding the interests of the food-consuming public, and has undertaken this role for many years with impressive diligence. Historically, his work has involved assessing risk on a scientific basis, and advising ministers accordingly, which is a process Henry feels is probably most appropriate. This is based, inevitably on the supreme importance Henry attaches to science - for him, science is the only legitimate arbiter of food safety issues, which means that a committee charged with food safety must have as members scientists from relevant specialisms. However, in recent years, this method of evaluating risk has come under fire, particularly following approval of food irradiation and early genetically modified foods for being too narrowly based. Henry appears not to accept the validity of these arguments, but the rejection by consumers of irradiated food, and the furore caused by the approval of an early GM yeast have clearly shaken him, and he now accepts the political unacceptability of evaluations based only on science.

Henry: [...] my third stakeholder is the consumer.

PQ: Yes

Henry: Because.... and that's become increasingly important over the last five years or so... there's been a real change in the way the committee works... [...] I suppose we started off nine years ago thinking that what we had to do was pronounce as a series of experts whether something was safe or not, and the public would accept gratefully our opinion, and would be comforted. Well, it doesn't work quite like that as you know.

PQ: No!

Henry: And the first one we came unstuck over was very early on erm '88 or '89 probably, where we approved a modified bakers yeast, which had a single gene transferred from another yeast... from a sister yeast which increased the rate of production of Carbon Dioxide, and so the bread rose more rapidly. And erm this was put up by Gist Brocades a very.... capable Dutch company. It was the sort of genetic transfer that could have happened quite naturally... Yeasts have a mating system, and we were very happy about the product. And so we cleared it. Erm.. it was handled badly from a public relations point of view, there was a very minimal press release...

PQ: Yes

Henry: And there was a substantially adverse press reaction, and the classic headline was, I think The Star which said “Are the boffins taking the rise out of bread?”, and all of a sudden we realised that we had a problem, because although the problem... the product was technically safe, and is technically safe, it’s never been used. And then we began to realise we had an issue here a bit like food irradiation. Food irradiation is a perfectly safe technology erm, but is unusable because of public perception... and unused. So at that point, we had a major re-think and erm, we, erm MAFF were very supportive we.. they funded a weekend conference of scientists theologians, philosophers, alternative groups...[...] So as a result of that weekend conference, a lot of changes were made...

PQ: Yes

Henry: We brought on to the committee a consumer representative, an ethical advisor, who’s there to advise if ethical issues are being raised, and we have put a press notice out before the meeting, we put a press release out after each meeting.... we meet 4 times a year. We have an annual report, we run a press conference... I talk particularly over this current... I talk to journalists all the time erm, I’m doing a radio thing at 8 o’clock tomorrow morning, and I did something.... you know...one or two a week is routine at the moment. So in all those ways we’ve opened the committee up, and we’re trying to make... we’re trying to work as transparently as we can even though there’s obviously some commercial confidentiality involved

However, he appears to consider these new issues, and the changes they have forced upon him as hurdles to be jumped before he can get down to the ‘real’ scientific issues, rather than legitimate concerns in their own right:

Henry: Erm, scientists are easy.... can live with uncertainty, understand the science, assume that new technology is usually beneficial - they make their lives by it. Erm.. are optimistic about the use of technology in the future, are aware of world trends, and know something about for example that we have only five agrochemical companies within spitting distance.... the whole business is rationalising very fast, know the limits of practical politics. The consumer has a quite different set of value systems which are concerned with choice, erm, protection of the family, they’re worried about lack of familiarity. The social scientists as you know use words like *outrage*, and erm *insult*, erm *stigma*, and to describe stigma describes food irradiation, outrage - what are they doing now? - the pejorative term. They approach from a different set of value systems, and one of the reasons for having the consumer on the committee is that we’re now very sensitive to those concerns. We can’t meet them direct.... in the sense of.... we’re not a consumer committee, but what we can do, or what we do do is say, well what sort of science.... what scientific questions need to be asked... answered in order to allay consumer concerns.

PQ: Right

Henry: So we asked the companies to produce information which technically they may not need to but which we know that consumers will ask for.

This point is also made when Henry explains how he sees his duty; the implication here is that he has made his own (expert) mind up about the usefulness of the technology, and so he is obliged to guide the public through to acceptance of it:

[...] In that sense I'm pro-science because I can't conceive of a scenario which makes sense for the UK which says no to these products [i.e. GM foods]. So I am trying to put.... bring them into use [...]

In the following passage, Henry is talking about the involvement of consumers in decision-making, which he is aware of as an important political issue. However, it is clear as the passage progresses that involvement is only acceptable from those who can be persuaded to follow his 'expert' line:

[...] so when I write, and I'm writing quite a lot at the moment, well, I'm preaching if you like, is a co-decisionmaking involving consumers.... and.. and scientists, because each illuminates the other. And that's a bit uncomfortable for some... for the medical community in particular, threatening for the medical community, and it wouldn't work in Germany, because the consumers there are totally unreasonable. But the consumers in Britain are actually quite reasonable, and you can work with them. The Consumers Association is perfectly all right. I go to closed meetings under Chatham House rules with the Consumers Association and they talk about the future for regulation, and I take part, I put my two penn'orth in and they listen. So no, there's actually quite a healthy debate going on at the moment, if we, we the people involved in it can avoid being hi-jacked either by the extreme left or the extreme right, I mean I'm not saying which is left and which is right, but the alternative groups are at one pole, and the companies are at the other. And you've got to steer your way through them. It's like a vice chancellor trying to prevent his Socialist Workers having a sit-in! [laughs]. You work with the great majority of reasonable people to persuade them that what you're doing is reasonable and sensible.

The importance he attaches to his science-based approach is underlined when he describes his relationship with other actors involved in the debate:

Henry: [...] I think the most extreme view is Greenpeace, erm who not only take extreme positions, but also use direct action and erm I...

PQ: You're not happy..... do I take it that you're not happy with either of those things?

Henry: [pause] erm.... yes, I think they polarise the debate extensively, very extensively, but the problem that all those groups have is (and I try to stay on as good terms with them as the manufacturers) but their problem as the companies' problem is that they stay in business by raising issues, so it's in all their interests to keep something going on the front page. I'm not a government servant, but neither am I.... my work is not made any easier by people going to the media all the time. It's part of my job to deal with that and so any group like that that goes to the media will tend to accentuate the problem to overstate the problem, and so my particular problem is that all the time, I'm trying to calm public concern. I think they over..... over rate public concern and that's because I genuinely disagree about the level of risk, but it's partly because they stay in business by over-rating their concerns - it's in their interests to over-rate concerns.

[...] My own view is that we slowly, carefully, calmly, go on with this introduction of product after product, being as open as we can, explaining everything we can. Assuming, which I believe is true that the majority of the public is rather pragmatic - wants good food and variety at a low cost. That is not actually the Greenpeace camp - necessarily - unless they get upset. Or

unless we... companies, regulators act foolishly. We've been rather blown off course actually by... by [the biotechnology industry] who haven't helped this process.

Henry's belief in genetic modification applied to food as a beneficial technology is complemented by his belief in moral and economic imperatives:

Henry: [...] You could ultimately.... there is a position which says "we think the risk is so high with all these products that this country will have nothing to do with them. That's not a position I hold. It has very substantial economic repercussions

PQ: I know it's a position that Norway have taken

Henry: Yes - It's not a position that I hold - I think it's a position that only a rich country [inaudible] goes on for the next 30 years can afford to take! We are.... our position is very different - we are host to a large number of multinational companies who can go anywhere else in the world, and if we said that, [major food manufacturers] would just move. There's... you know... Norway can be, frankly, marginalised, and survive, because there's 4 million of them living on fish and oil - being a bit cynical! My view is that Britain can't afford to do that [pause] in the next century the international world will be driven by the most effective use of our brains and technology

[...] but it's [organic agriculture] not a practical.... it's a way in which people can express their individuality in a very complex society which is in danger of submerging people's individuality. And of course they have the right to opt out, but it's not a practical solution for a society - at any rate, that's where I am I suppose. We have to feed a lot of people rather cheaply.

Henry has a coherent world view into which his work fits. He is a Christian, and active within the church:

[...] I'm also a church goer and I think as a Christian I have a responsibility within the created world.

This notion of responsibility, which he credits Rachel Carson with starting is something he feels is now accepted and acted upon:

So no, we've moved from exploitation to stewardship [of nature] and that's a move that was triggered by the possibility which Rachel Carson and others erm alerted.... I was your age when Rachel Carson wrote her book

Henry: It's a... it's a... inevitable issue [loss of biodiversity] if you go to monoculture. And there are very good reasons for going to monoculture. So then, the [inaudible] say well what can you do... we do need to maintain biodiversity for both pragmatic reasons - that is the genetic pool here which is of great value, and we probably also need to do it for philosophical reasons - most people would agree that we haven't the right as one species to just wipe out erm other varieties on the world.... We've moved from a mining analogy to a stewardship analogy over the last 30 years.

PQ: Do you think we really have?

Henry: Yes, I think many people....

This passage also illustrates Henry's belief in the intrinsic value of nature, and he makes other similar statements about the wonder of the natural world; statements which could be construed as ecocentric. However, given his belief that as a society we have moved from exploiters to guardians of nature, and his faith in science and technology, his strong advocacy of technocratic solutions is logically consistent. This also resolves an apparent contradiction about his hostility to the environmental movement, who purport to defend many of the ideas he has articulated. If a move to stewardship has already occurred, the environmental movement is now redundant, and interested only in self-preservation.

Towards the end of the interview, Henry acknowledges the logical link between his value systems and his work, which appears to be a considered response, rather than a knee-jerk reaction to a leading question:

PQ: It sounds to me talking to you that much of what you do is driven by what you feel personally. Is that fair to say?

Henry: I suppose so, yes. I mean, I don't have to do this job for MAFF, I don't do it for money, and I actually do think the technology is of revolutionary importance, that the world population is going to grow, and any... all of us have a tiny part to play working for the future. This is my tiny bit, that's all!

Thus Henry has constructed a consistent, if controversial normative structure which could (with further probing to fill in gaps) be represented by a series of hypotheses and normative statements. He illustrates the problem of theoretical 'ideal types'. While his anthropocentric/technocentric consistency is apparent, there are statement which could be construed as being ecocentric, for example when he mentions the rights of species to continue existing. Arguably then, Henry is a conflictual ecocentrist/anthropocentrist who should be considered in the next chapter. Henry's residence in this chapter rests on an interpretation that he is predominantly consistently anthropocentric, and an acknowledgement that ideal types rarely exist. Recall that in figure 5.1, the box into which Henry is slotted almost touches the other three.

Henry also illustrates Fox's criticism of Naess, that worldviews which conform to Naess's definition of 'deep' can be 'un-environmental'.

5.6.3 Case Study: Paul

Paul is a senior representative of a major UK food retailer, where he works on technical issues. The interview took place in a meeting room at the company's head office.

This interview was dominated by Paul's perception that he and his employer had been unfairly treated by the media and campaigning groups. He felt that they had acted with integrity in difficult circumstances, but were being attacked as a result of misinformation and because of their high profile.

The interview started by discussing Paul and his company's relationship with the various actors involved in the debate. The Natural Law Party were singled out as a cause of particular irritation for Paul, partly because of the Tryptophan incident⁵ and the Brazil Nut allergy incident. Paul says little about the Tryptophan incident, but it is clear that he shares Brian's view of the issue. As discussed in Robert's section, two logical interpretations of this issue are possible, both of which are plausible given the available information, which is causing considerable friction between the two sides. The second example he gives refers to the transfer of a Brazil Nut gene into a Soya Bean which was allergenic to people sensitive to the former. That the problem was found and the seeds of the new variety destroyed, Paul interprets as an example of the effectiveness of the safety mechanisms in place. However it can also be interpreted as an example of the unpredictable side effects of genetic modification, which may not be picked up in the future. He dismisses the Natural Law Party's technical experts on the basis that one of them represents "Maharishi's University in Iowa". He appears to be referring to John Fagan who publishes regularly in refereed journals and receives funding for his research as a geneticist, which calls into question Paul's dismissal of his academic credentials. In addition, Paul attempts no such dismissal of their other expert, whose identity is less easy to ascertain than Dr. Fagan's. Finally, at the close of this passage, Paul claims opponents of GM food use "scary science selectively". This is a very similar argument to the one used

⁵ This issue is covered in Robert's interview, section 5.3

by Simon in order to criticise supporters of GM food, where he feels they use reassuring science selectively.

This passage, therefore, represents a series of plausible interpretations of information which dismiss his opponents' case, all of which can be given equally plausible alternative interpretations which damage his case. The implication of this is that despite his claims of neutrality, and of responding to consumer demands, he appears to be personally in favour of the technology.

Paul: [...] the initial contact from them [the Natural Law Party] came from two apparently eminent... erm Professors, erm... who were doing the rounds in Europe and it was only from some closer investigation that we could see that one of them was Professor of the Maharishi's University in Iowa.

PQ: Oh yes, [Brian] was telling me all about that.

Paul: And there are various off shoots of that organisation, and you know, a lot of the stuff that we see in concerned consumers letters and approaches to us, with depressing regularity is the same old stuff that has been dished out by them, handed out leaflets. Erm... you know, the things like, the tryptophan incident you know it just keeps getting churned out. Er, the other key point is the transference of allergens from Brazil nuts into Soya which was stopped, and the seed destroyed, it still gets, you know, churned up as an alarmist thing, with we are creating potential problems with allergies. So yeah, to a certain extent what you say is true but I think also that you use science, scary science, selectively

Paul was chosen as an interviewee because of his close involvement with the launch of an early GM food. Questioned about the success of the product, he responds enthusiastically, and in the second excerpt makes clear that rather than testing consumer reaction to GM food, this was an exercise in promoting it to them.

PQ: How did your [GM food product] go?

Paul: Brilliantly

Paul: The key thing about that is that we saw it was a good example with working together with the biotechnology company involved and getting the PR story straight and being very open and transparent with the public about what it was, and we worked on that together. So that when the product was on shelves there was a very ready take up of it um and its just been accepted as being one of our products, and we sell increasingly more than we can get hold of. We told some of the companies involved in the Soya industry and that's been used as a good example and we recently um I don't know whether [name] mentioned this, the chemicals industry used that as an example of promoting science.

Here then, Paul defines his professional actions surrounding GM food as firmly anthropocentric.

Paul seems to be aware of the political unacceptability of promoting GM food, and so despite repeatedly explaining how he and his company have done this, he also denies it, hiding, behind the fig leaf of customer choice. Note the contrast here between Paul's attitude to organic produce, which he sees as just another option for the consumer, and that of Mark, who sees it as part of a world view which is incompatible with GM food:

I mean, it's interesting that we're being seen as the villains by promoting genetically modified foods which isn't the case. At a time when we are rapidly expanding our organic market to the extent that we are signing up contracts with producers to supply us organic produce and we have had a lot of recent publicity on that as well and I think the two go hand in hand because you can demonstrate that you are not looking exclusively at genetic modification if here we have got organic produce, widening customer choice which is what it's all about.

In the following passage, Paul is talking more generally about technology in food production, in which he uses two devices to align GM food with earlier technology. Firstly, he gives an example of an earlier food technology which is now generally accepted, with which he makes the point that GM food will, in time, be accepted. Secondly, he argues that genetic modification is an extension of traditional plant breeding. The equivalence of these two technologies seems to mark those who are for or against the technology; Paul's use of this argument emphasises his sympathy for it. He acknowledges a moral limitation to the technology in that he considers the genetic modification of animals to be unacceptable, but it is unclear whether this is as a result of how he perceives the views of his customers, or direct consideration of the ethical issues it raises.

Paul: erm... I understand that there was tremendous outcry when pasteurisation was introduced because it was not seen as natural. So is there really a moral ethical debate? When you are talking about the true nature of genetic engineering as far as plants are concerned we have always taken the position that if you want to start discussing genetic multiplication of animals or introducing animal

PQ: That really is a can of worms

Paul: yeah, stop, we're not interested in that. But you know I don't think there is a strong case to argue that genetic manipulation is really unethical as far as plant life is concerned it's just an accelerated form of plant breeding. Which has been used, and accepted, for many, many years and now they have perfected a new slant on that and as I said we use whatever technology is available to us at the time.

The following passage starts to probe the link between ethics and professional action. Paul begins by using the argument that it would be difficult to sustain a contradiction between the two, and so it would be unlikely to occur. However, he then implies that a ‘technical/scientific division’ of a company is amoral, and so no such connection is possible.

PQ: Do your own ethical and moral views drive what you do in any way or do you see it as being rather divorced, the two?

Paul: No I think that if anyone was totally honest, they’d say that they’d find it difficult to perform properly in a capacity that conflicted with their personal views. If that was the case they wouldn’t want the job. So I don’t think that, it certainly doesn’t apply to me, and it I am sure it wouldn’t apply to anyone here but then this is a technical scientific um division and there is given the respect that this division has within the food industry and within [Paul’s company] as an organisation I think everybody within it feels a tremendous trust in their colleagues and the advice that they are given.

The compartmentalising of ethics and morals Paul implies above is emphasised in the following two quotes. In the first, he seems to be saying that if an individual has strong ethical views on GM food, they wouldn’t be working for his company. This in turn implies that GM food, indeed the international food trade is morally wrong - it becomes acceptable only if morality is ignored. He then goes on to talk about his company’s environmental department, a part of the company he portrays as being populated by individuals with strong ethical views, in contrast to the company as a whole. In the second, he mentions an ethical training course, which again seems to stand apart from the rest of the company’s activities. He clearly sees it apart from the activities of his own department, an addition to the company’s activities rather than a curtailment of existing ones.

Paul: but if I could suggest that someone with, you know, accepted strong moral/ethical stand points on an issue like this is hardly likely to be working for an international food company.

PQ: Yes that’s true enough

Paul: I won’t make a comment about what they might be doing as an alternative but do you see my point of view? I think you can’t, the things develop hand in hand and if you’re not comfortable with a particular line we’ve got a really strong environmental department here and the people working in that are totally committed to what they doing know they might have a hard job sometimes convincing members of the board that we should go along a certain route but they do it because they are committed to it and people in the organisation respect that view.

Paul: but having said that, this [the ethics of GM food] is just a side issue, I’m not being dismissive about ethics. Because one of the things that we’ve just started is an ethical training course.

PQ: Oh yes [name] mentioned that you do that.

Paul: Yeah, which is, we're very excited about um but you can't please everybody [...]

It is difficult to make sense of Paul's conflicting statements about the importance of ethics and morality. However, a possible interpretation is that he sees them as a response to the wishes of his customers rather than an essential part of the business. The compartmentalising of ethics he hints at throughout implies this, as does his implication that they are irrelevant to his own scientific/technical department. Paul's direct statements about ethics are mirrored when questioned about environmental values. A line of questioning which proved fruitful with some interviewees using the impact on biodiversity of GM foods (positive or negative) failed to produce any response from Paul on a personal level (see section 5.4.1 for an exploration of this issue); he merely indicated that his company has a department which considers such issues fully. Questioned more directly about his own environmental values, Paul did not seem to be trying to evade the question as might have been expected from some of his earlier answers. In fact he seemed to be very candid about his answers, which revolved largely around the lack of importance he attaches to environmental issues.

PQ: [...] How do you feel about ideas like the intrinsic value of non-human nature]?

Paul: I can't say that I've really given that much thought.

Paul talks at length about the usefulness of recycling, which he does to some extent, but this is based around the existence of markets for the material recovered, and how well the activity fits with his own lifestyle. Similar instrumental arguments are used to place value on the general state of the environment, as Paul wishes his children to grow up in decent surroundings. Although Paul seems to feel that his anthropocentric view of nature might somehow be 'wrong', he feels that his own views are very much in the mainstream. He dismisses ecocentric ideas as being too radical a change from the way things are, and, in the same way that he felt conflicts between work and values are untenable, does not express environmental values which are in conflict with how he perceives wider society to be.

PQ: They [anthropocentrists] often use religious arguments for this, I mean I'm not a religious person but there is a passage in Genesis which says that the

world was put here for mans domination or something along those lines. Do you think that's a reasonable idea or do you have any sympathy with the intrinsic value idea, I mean you obviously haven't thought about it.

Paul: I think it's like the environment issues if you can balance these things against what is, what they want. Lets face it people are primarily concerned about their immediate life style, this very short term life style without getting into all the considerations of the type you've described and er that might be a sad reflection on the way humanity has developed, but that's where we are and were not going to change it overnight and I suppose that's quite a selfish point of view that [inaudible] what they would want what they aspire to the sort of things they want to do with what limited leisure time they want to get and the thought of overturning that and setting a whole new agenda um you know and I admit that I haven't thought about it very extensively, it doesn't figure on my agenda. It sounds a bit unfortunate but....

PQ: I am grateful for your honesty it's very easy to be...

Paul: I know what I want, and I know what I want for my kids and I have to say sitting here thinking about it that really doesn't, sort of.... considerations about the environment generally and using nature or exploiting nature I am afraid doesn't really figure, because you know, we are confronted with a society that we live in today that has developed over hundreds of years and um yeah sure I question that some things might be wrong with that, but I see what I can achieve within that, and if that suits me, well fine and to be quite brutal about it I think that's what most people will do.

PQ: Yeah, what you've said is not outrageous in any way it's just

Paul: There are a lot of things we do which are not environmentally friendly you can say we are exploiting nature in the worst possible way but if it's there they'll do it!

Locating Paul as a consistent anthropocentrist is relatively unproblematic. When discussing his work and his values, his discourse is dominated overwhelmingly by anthropocentric ideas. The doubts he hints at in the last passage about the desirability of an anthropocentric society perhaps hint at some level of ecocentrist sympathy, although it is clear that if he carries such a notion, he does not use it to formulate his world view.

5.6.4 Case Study: Mary

Mary works on genetically modified food policy for a food industry trade association, and frequently represents member companies in the media and elsewhere. The interview took place largely in her office, although shortly before my arrival she was asked for a television interview, so our meeting had to take place in somewhat frantic circumstances as she prepared for her appearance. Towards the end of the interview, the television appointment was cancelled, and the interview became more relaxed with fewer distractions.

Mary, in common with others working in the food industry presents herself and her employers as being respondents to the wishes of consumers:

[...] retailers must take account of what their customers want and it's the customers, it's the consumers who dictate.

However, further probing reveals their role to be less passive than Mary at first presents. She sees consumer attitudes as something to be guided and managed; the following quote explains her efforts to avoid a consumer scare through not generating additional publicity for GM food. Her interest in a favourable public perception of GM food was also underlined when talking to Mary by telephone to arrange a meeting, when she was adamant I use the term *modern biotechnology* in preference to *genetic engineering*, as she felt the latter term was less likely to raise hostile reactions from the public.

We decided rightly or wrongly to work very hard for segregation behind the scenes and not to take a public profile on this, now um, when approached we've, um, by the media to do interviews on the radio or TV or whatever, um or these kind of things over the phone, we've taken each one on its merits [...]. So, um, I have done one or two things but quite frankly we didn't... we were anxious as retailers not to tip this over into consumer scare because as we see it there was no food safety issue

This notion of consumer attitudes as something to be managed rather than responded to is echoed by the lack of research into this either undertaken by her organisation, or of which she has made herself aware. This seems to reflect a desire to influence rather than react to consumer attitude, which conflicts with her stated position.

PQ: [...] So you don't actually do the kind of research where you get a panel of your customers together and say "Well here is an issue you may not have heard about, what do you think of it?"

Mary: I know that [member company of Mary's association] has done some er, customer research, um obviously they are not going to share it with everybody, because it is for their customer profile and so forth um, but I know they have done some. I know [food industry trade association] have done some, [another food industry trade association] have done some, we haven't [...].

Mary's view of the safety of GM food is restricted to the scientific risk assessments of the regulatory process. This means that wider ecological hazards are not something she includes within her conception of safety. In the following

passage, she illustrates this by declaring her belief in the safety of GM Soya, in contrast to ampicillin-resistant maize which the regulators have indicated may cause a transfer of this property to humans.

with the Soya there's been no question mark at all over the safety in any way

[...] with [company name] GM maize into the realm of uncertainty because nobody had actually done post-release monitoring on animals to see whether it crossed in the gut into the micro-organisms or into the cells. That came out in a conference in California last October [where it was] said that it actually has got into the cells, and the spleen, and the liver of mice. This was covered in The New Scientist and in The Independent round about the beginning of this year. [...] And so for the moment we're just saying to our suppliers "don't use unprocessed GM maize in animal feed"

Pressed further on the wider safety implications of GM crops, and their role as a continuation of industrial agriculture, Mary returns to the importance of consumer demands, by indicating that were there a shift in public opinion in this direction, the food industry would take account of it. However, given her earlier comments about the lack of consumer research in this direction, it is difficult to imagine how this could occur.

PQ: [...]there is something very symbolic [about the first genetically engineered food products], er, talking about the direction that we want to go in as a society, our agriculture, our relationship with nature, and for them [the environmental movement] those issues are the most important. I mean, do you see it as something that the retail trade should engage with, those sorts of issues, or do you just see it as one product?

Mary: No, it's something at any one time, retailers must take account of what their customers want and it's the customers, it's the consumers who dictate.

PQ: So it's driven by them rather than any feelings that you might have?

Mary: Yes, definitely, very definitely, and if there were groundswell of opinions from their customers um, you would get a turn-around in retail policy, either with an individual retailer or at the [Mary's employers].

May's comments above seem to contradict the following excerpt where she talks about rising consumer interest in organic food. Her discourse on organic farming contrasts markedly with that surrounding safety fears on maize. Here she uses very generalised ideas, for which she does not indicate any kind of grounding. In the last sentence, she reveals a number of interesting points. She indicates that the movement of farming methods in an organic direction is not something she would consider, and follows this up with her perception that her members are pursuing the introduction of GM foods, rather than responding to consumer wants. This seems to contradict her portrayal of the food industry as responsive

to consumer wants by presenting it as having the intention of introducing GM food.

[...] certainly if you believe the chattering classes is that there is a swirl of opinion in favour of encouraging organic farming into main stream and encouraging less intensive farming lets say. I don't think we will be able to get back to extensive given the population density in the Western World. But these are things that all of the, certainly large retailers and the small ones benefit from the knock on effects, are looking at with um, to greater crop management, modern techniques and so on. So I would never specifically look at it since I've been here but I'd just assume that I know what their feeling is, simply because they are pursuing um their transparent and responsible introduction of modern biotechnology into their own food businesses.

The following passage, which forms part of a discussion on the impact of GM crops on biodiversity again reveals the problematic relationship between consumer wants and food industry behaviour. Biodiversity appears to be something which Marry has not considered professionally, and uses the argument that her members must have considered the issue because their customers are concerned by it. This is an argument which could be used to side-step any question relating to the wider issues raised by GM foods, and again contradicts her comments about the level of consumer research:

[...] but I guess that implicitly because they [retailers] are going down this route um, they have taken the view that it's not going to diminish biodiversity because the retailers aren't in the business of doing anything that their customers wouldn't like

Mary's views on the wider environmental issues raised by genetically modified foods are strongly Darwinist - she believes that our damage to the non-human world is a manifestation of the domination of the fittest (human) species. In this sense, she is firmly anti-ecocentric, in that this argument excludes the consideration of a wider sense of self which encompasses the non-human world. Her Darwinism extends to the responsibility she feels for preserving the environment, which centres around future generations (of humans) and specifically her own children. She acknowledges that humanity's Darwinian 'fitness' may be transient, but does not use this to argue for a more ecocentric perspective, but to imply that in the future, other species may become dominant. It could be argued that her view is ecocentrist as it removes the special place reserved for human beings in an anthropocentric worldview. No other

interviewees used this argument, but it seems to enable Mary to side-step the issue of environmental values entirely by assigning to nature an amoral, mechanistic quality (see Chapter Three), so perhaps a more realistic appraisal is that it is neither anthropocentric nor ecocentric, and that further questioning would be needed if she was to be categorised.

[...] I'm sorry it is survival of the fittest and we're the species that is dominating, raping or whatever you want to call it for the time being. I really do, I can foresee a day when perhaps we will bring about the end of our own species for whatever reason, either we are cast out of existence or we change the environment such that we can't stand the temperature anymore, you know, the micro organisms take over, whatever. Um, so I think it's er, it's up to us to make sure we keep things in perspective and respect the environment. I personally do believe that and I would hope that I would do my little bit to encourage that attitude and even I'll pass it on to my children and they will pass it on in due course,

More generally during the interview, she puts forward anthropocentric arguments, and this passage in which she describes her technological and economic optimism is another example. This locates Mary firmly as a technocentrist.

[...] if we, for example, use up all the oil resources, I don't feel especially worried about that because by the time the price starts getting up there, industry will make sure it develops alternatives, whether it is from sustainable crops or whatever. But I don't feel worried about it, I have a basic optimism in life and a basic kind of humanistic approach [...]

Throughout the interview, Mary appeared to be being open and honest in her responses, but was consistently reticent about expressing her values. This appeared to be because she did not consider them to be relevant to her work on GM food, an impression underlined by her efforts to portray herself, her employer and the wider food industry as passive, amoral respondents to consumer pressure, to science and to forces outside their control. In the following passage she talks about the relationship between her work and her family life, and while it was clear throughout the interview that she undertakes her professional duties with vigour, she gives priority to her family, and seems to compartmentalise the two which perhaps helps her to keep her values away from her work.

Mary: [...] and I am just very busy, I have two small children [...], that I want to get off promptly in the evening.....

PQ: Yes of course.

Mary: [...] and I live two hours journey away by train from work, so um, I, I do my job as well as I can but um, er, I haven't perhaps schmoozed and dined on the sorts of things that you could argue, would have been do-able to help foster relations. And quite frankly my members aren't um expecting it of me, I need to handle the job well.

This excerpt also makes the pragmatic point that she is simply very busy, and cannot devote the time necessary to familiarising herself with the wider context of GM food, and indeed does not consider the abstract notion of values of sufficient importance to devote time to considering them. Unlike John, she has not chosen a career for reasons relating to her value system, which for him has created a link between his professional and personal life. Mary appears to have no such link, which perhaps helps her to keep her work separate from other aspects of her life.

The difficulty experienced in exploring Mary's values was perhaps exacerbated by the context of the interview, which took place in a professional setting. It is not unreasonable to suppose that given the separation that seems to exist between her work and her personal life, that she did not feel able to talk about her values in the interview. Perhaps an interview in a different setting would have yielded more.

From the material gathered however, it seems most appropriate to categorise Mary as an anthropocentrist - certainly her professional actions conform to this category, she made no ecocentrist statements, and some value statements which were anthropocentrist.

5.6.5 Summary of Anthropocentric Respondents

One of the most striking features of this group is their professional homogeneity. With the exception of Henry, all work in the mainstream food industry, a consistency which applies to no other group. It is not possible to ascertain from the interview material why this was so, although these were also the most difficult group to persuade to talk about their values. It is possible that insufficient depth of questioning was achieved to permit the uncovering of ecocentric values; certainly this was the group with the most well rehearsed corporate line, from which any talk of values is a deviation. However, it could also be that this industry, particularly its senior ranks attracts anthropocentrists, or alternatively that it shapes the worldviews of its senior employees. In any event, this group seem to be particularly prone to the systematic barriers to uncovering ecocentric values explored earlier in the chapter, which perhaps explains why there are more of them than one might expect with reference to Kempton *et al* and Craig *et al* (see Chapter Two).

Andrew was perhaps the most coherent of all, with a series of anthropocentric justifications from which he never faltered. Paul gave a slight hint of ecocentric sympathies, but not really sufficient in isolation to categorise him as conflictual. Mary's worldview seemed less rehearsed than Andrews, but she was emphatic about her Darwinian values, which are firmly anthropocentric.

Henry was perhaps the most difficult to classify, but his worldview seemed to rely on the joint pillars of Christianity and science, which he interprets in an anthropocentric way. Henry seems to be trying hard to come to terms with the non-scientific issues he is now expected to cope with, and the interview is peppered with 'buzz words' he does not seem comfortable using (stakeholder in the first excerpt for example), and which he does not seem really to believe. It is for this reason that his hints at ecocentrism did not seem convincing, and he has been classified as an anthropocentrist.

5.7 Conclusion to Chapter Five

This chapter has gone some way towards validating the theoretical approach taken. Despite the problems with Naess's notion of normative structures, most notably their presentation of an ideal type and Billig's contention that thought takes the form of argument rather than exercises in logic, the ecocentric interviewees presented, to varying degrees, world views which seem to fit Naess's methodology. The anthropocentric interviewees appear to conflict with Kempton *et al's* findings in both their number and coherence, but this was perhaps due to their unusual (compared to the public) professional positions. The following chapter will move from considering individuals who seem to have a fairly coherent worldview to those who don't.

Chapter Six: Conflictual Interviewees

6.1 Introduction

This chapter consists of vignettes describing each of the interviewees allocated to the *conflictual* category. This means that they express ecocentric values, but behave professionally in a way which can be interpreted as anthropocentric. In the context of GM food, and drawing on the material in Chapter Three, the promotion of GM food is taken to be anthropocentric.

The chapter is structured around the professional position of each of the interviewees. This is less straightforward than might be expected, as most interviewees hold multiple positions. Recall that each interviewee was selected for their importance within the debate, which bestows upon them the status of *expert*, and thus makes them likely to participate in the regulatory process, or act as an advisor to other groups in addition to their main professional position. For this reason, and solely for the purposes of structure, the interviewees are categorised only according to what appears to be their main affiliation, so no categorisation exists for regulators or advisors.

6.2 Scientists

This section includes Eric, Alan and Simon. All are geneticists: Eric and Alan are involved in the advisory committee structure while Simon acts as a technical advisor to various groups.

6.2.1 Case Study: Eric

Eric is a biologist and senior academic who works within the advisory committee structure. He regularly appears in the media and public debates as an expert on genetically modified crops. The interview took place in his university office.

Eric is a particularly thoughtful interviewee, who is aware of many of the conflicting issues which arise from his work, and has clearly given them much thought. He is proud of his work within the advisory committee structure, which he considers to be rigorous and independent:

I honestly believe that as [a member of an advisory committee], and everything I've done for [the committee], it has been to try and ensure that the new technology is regulated appropriately. So if and when an accident happens, it will be despite the best efforts to prevent it happening. I think I've been pretty dispassionate. Erm. Whether I have or not, history will tell. But I do actually believe that we don't allow things to go forward that can cause problems. [...] The trouble is nearly everything that comes to us at the moment, I can see no reasonable risk, so I don't have any great worry for most of it that we're doing anything other than bureaucracy.

PQ: Do you have any pressure from ministers, civil servants, or whoever, trying to influence the kind of decisions that you make, or do you feel that you're entirely independent?

Eric: I have not signed the official secrets act. I have never once been pressurised to do anything. If I were pressurised, I would immediately notify the press.

PQ: Right

Eric: There's been no problem there whatsoever, and I would not agree to be re-appointed.

[...] We believe we're impartial.

Despite his defence of the committee's work, he feels that its consideration of risk in isolation is too limited; it cannot for example weigh risks against benefits, nor comment on the inherent desirability of a release on the grounds that its future commercialisation would be inappropriate.

Eric: And basically what we do is we look at something, and say how has this genetic change affected it so that it may become a weed, it may become poisonous, it may have immediate knock-on effects, and if we don't see any of those, then we offer the advice that it is appropriate that it be released. We're not allowed to have subjective opinions. So if we don't like an experiment, but we believe it is safe, then we say to the minister it is safe.

PQ: Is that because somebody else deals with those issues...

Eric: No

PQ: or because they're not considered appropriate?

Eric: No

PQ: Nobody does that?

Eric: Nobody does that, and that's why at the moment after Tickell's report on Sustainable Development last year the department of the environment is setting up a meeting for March to discuss this gap which has been picked up by the... Greenpeace and others.

He is candid about his own limitations as an actor within the debate on GM food, for example the following excerpt where he outlines how his credibility is undermined by others' perceptions of his personal interest in the technology.

Eric: [...] But you don't have a vested interest one way or the other do you?

PQ: Erm... no, I suppose I don't.

Eric: But it could be argued I do.

PQ: [pause] Yes.

Eric: I'm almost inevitably going to argue that the technology is intrinsically safe, and there's nothing wrong with gene manipulation. because I'm a career geneticist. So I'm disadvantaged [in any discussion]

Much of the interview is taken up with discussing conflicts brought out not just by genetically modified foods, but industrial agriculture in general. In this passage he juxtaposes the ecological problems associated with monoculture with the need to produce large quantities of food.

Eric: The biodiversity issues are relatively straightforward for groups. High yielding agriculture without large labour input virtually has to be monoculture. There is no argument agronomically about that. So everything we do given an ever increasing world population is going to lead to more and more monocultures, unless until we can find ways of multi cropping that are compatible with machine harvesting.

PQ: Right

Eric: And so I think the monoculture one is... It's a real argument. Monoculture basically is wrong, biologically. Monoculture is designed for pests. So by having monocultures we enhance pest problems. But we enormously reduce the cost of food production. And the price we are willing to pay, in inverted commas, is that we will use chemicals, and that we will harm the environment. No weed species will grow and so forth.

This is something of great personal concern to Eric:

[...] Historically we've wiped out a lot [of plant species]. It doesn't mean we shouldn't worry about wiping out even more. As a biologist, and someone with a great love for nature, I'm immensely disturbed that we allow so much land to be used for arable agriculture. The South Downs have been largely ploughed up. I think it's a crime. [...]

He uses several arguments to resolve this conflict, the principal one being the need to feed an increasing world population, while dismissing organic

agriculture, albeit from what appears to be a background in chemical based agriculture.

Eric: Well [pauses] my background - I did a diploma in agriculture first, and I have a very strong feeling for the agricultural industry.

PQ: Yes

Eric: The biggest problem I have is that you very seldom see in any of these debates a proper understanding of feeding immense populations.

PQ: Uh huh

Eric: We see an awful lot of guff about how you can go to sustainable agriculture. That's total nonsense. Because every time you take a crop off the land you take nutrients out of the soil

PQ: Uh huh

Eric: And if you go way back to medieval agriculture it was phosphate limited. And it was only when we started adding fertilisers and so on that we could actually begin to get yields up. So this concept that somehow we mustn't interfere with nature I think is crap.

In the following excerpt, Eric is expressing the view that the agricultural methods proposed by environmentalists would be capable of supporting only a much smaller global population than at present,

I think we need a mass human extermination if the ideals that are being put forward by the Green groups are ever to be realised.

but on further probing, Eric considers the major problem with high yielding sustainable agriculture to be labour rather than soil fertility. Here the problem shifts from being a technical imperative to a social and political choice.

PQ: Assuming that you could get a proportion of these 3 million [unemployed] out onto the land, would it theoretically be possible to move towards a more organic, more traditional form of agriculture and still feed the country?

Eric: [long pause] Assuming we still import food, yes. But you're not going to get an average of 6 or 7 tonnes of wheat from anything other than a well sprayed monoculture. And the real difficulty if you go to somewhere like India where they do proper mixed cropping, you have five different things all growing together. Unless you harvest by hand, you can't harvest successionaly. [...] There's absolutely no way we can conceive of human harvesting. [...]

Eric raises the issue of humanity's pervasive influence on the English landscape, but not to dismiss notions of nature conservation as Andrew does, although it is clearly the site of some internal conflict. In the following passages, he talks at length about the ancient artificially created landscapes which are being destroyed by industrial agriculture; clearly something of concern to him. He justifies this with reference to the pleasure such landscapes give him, but at the same time calls into question these motives by suggesting it might simply be nostalgia for

the countryside of his youth. The detail he gives suggests that these are not arguments he has constructed in response to the issues raised in the interview, but something he has devoted some thought to over a period of time.

I would like to see much more money given to hill pastures, for the maintenance of the damage we've already done, but what we like.

PQ: Why does the state of the South Downs bother you?

Eric: [pause] Because I think there's an intrinsic beauty in the countryside which is important for people's well being.

PQ: Uh huh

Eric: We're gradually destroying it. Whether it matters, I really don't know. Before the enclosures, and sheep farming, the country was totally different, and so on and so forth. I think possibly when you reach your 50s, you begin to look back to what in your youth you thought was nice. And that's what the place ought to be like. So when my sons are my age, they'll probably look back to now, and say it should be like that now. So it's maybe just the grumblings of an old man. Dunno. I really don't know. I just think there should be relatively unspoiled countryside, in terms of birds and bees and butterflies. I don't mind if they are enlarged patches. I don't think the whole country should be like that because it's unreasonable. But I think the patches should be large enough that these are sustainable. And I don't see it.

During the interview, the discussion includes a broad range of issues relating to the context of Eric's work, including some of the arguments put forward by the opponents of GM food. These are issues which Eric seems keen to engage with, particularly notions of environmental protection. As part of a wider discussion about the intrinsic value of nature, Eric talks about the destruction of the Brazilian rainforest. However, although this is a topic about which Eric has strong feelings, it does not appear to form part of his professional training (see above). This is reflected in a shift in his discourse away from the specific and the grounded towards the generalised.

I don't think.... I think this argument that if you chop down a bunch of trees, the whole world will change is a very very weak one. We've totally wrecked the ecology of Europe, and the planet still rotates, we're still alive. OK, it's maybe less good than it was, it might be better in some places, I really don't know. And I don't think to say we must maintain things as they are is sensible. Or to say we must go back. I think chopping down the Brazilian rainforests is lunacy. But if I was a hungry person there, I would chop it down. I'm not sure I could argue with hungry people there why they should be hungry and leave the rain forest.

Eric also has strong feelings of helplessness and apathy in the face of environmental damage. He portrays the forces of economics as an overwhelming

power against which he can do nothing, and his lifestyle as a cocoon which only large sums of money will persuade him to leave.

I have the problem as a pragmatist and a cynic that given our population, given the economic constraints on what we do, there's almost nothing I can do as an environmentalist that will help. Beyond joining the National Trust, which I have done.

I think I'm a fairly common, self satisfied, European. I drive a big car to work on my own, because it's convenient to do so. On the other hand I have a plot of $\frac{3}{4}$ acre. I like the environment. If I had £20 million, I'd probably go and be a farmer. I love the environment, I love walking, but I am not willing to translate that into not driving to work on my own in the morning. So I'm like most people, highly hypocritical.

During the interview, Eric makes no statements which categorise him unambiguously as an ecocentric. However, pervading the whole interview is a strong sense of the profound attachment Eric feels for nature, an impression which was all the more powerful while actually speaking to Eric than it is when reviewing a transcript of his discourse, although that impression does emerge from the excerpts reproduced here. He justifies his participation in the process of industrialising agriculture still further by the non-existence of alternative methods of producing such large quantities of food, an argument which, despite the importance he attaches to it, appears to be outside his expertise.

6.2.2 Case Study: Alan

Alan is a plant geneticist, and also works within the advisory committee structure. The interview took place shortly after the National Biotechnology Conference at Lancaster House, which both Alan and I attended, which provided a starting point for discussions. Alan considers such meetings to be of little more than cosmetic value, because the two sides, industry and NGOs have entrenched, irreconcilable views, which make any kind of consensus impossible. The possibility of consensus is further undermined by Industry's unwillingness even to participate in debate in these fora:

Alan: [...] And the industry were very quiet for all kinds of reasons, which I don't fully understand, I think it's something to do with.... they don't want.... as it was all recorded, they don't want to be..... they're usually much more comfortable about responding in writing. To be sure that they can project.... they can consider and mull things over and give a considered view, rather than be talking on microphone, and to be perhaps seen to be in an active ding-dong with Greenpeace, [co. name] and Greenpeace, [company name] and Greenpeace and so on. That could potentially be bad for them. So it's....

PQ: Dangerous for the individual if they make a mistake.

Alan: Sure. Their whole future depends on it. So, I found that... I tend to find these kind of meetings where there are interest groups battling sort of from one extreme of the argument to the other, and it just goes back and to, back and to, Greenpeace line, and Friends of the Earth, and Genetics [Forum] and so on line is that, and Natural Law Party, that we shouldn't be doing any of it: it's completely unnatural, it's genetic pollution, it's therefore unacceptable, erm, on the other end we should er move things forward as quickly as possible, compete with the Americans, it's the only way we're going to survive in biotechnology, and so where you have those two extremes, the debate can't go anywhere.

PQ: No. They're irreconcilable.

Alan: And I think in a way that the extreme green that the Green end of the... you know, the ones that want to stop it, they will be shut out of the argument. OK there are these sort of cosmetic meetings, like Lancaster House, but in effect because of their extreme views, people are not listening to them. And I think in a way that is a shame, because I think in the sense that the strength of a government is.... government is as strong as it's opposition, so if we have a good, effective, and thinking, intelligent opposition, then it means that it keeps everybody on their toes.

This passage provides a useful insight into Alan's own position - he is clearly unhappy with both industry and Green arguments, although it is only the Greens he terms 'extreme', which seems to be more a statement of his own views than a statement of how he considers they were perceived at the conference. However this apparent leaning towards industry is tempered by his example of industry's need to portray an image which is not balanced by the assigning of similar motives to the Green lobby. Given the criticisms which have been levelled at

Alan's research institution for its close links with industry, this is perhaps unexpected.

Talking about the arguments of the Green groups, Alan rejects them in a predictable way:

[...] the genetic pollution erm... argument I can never, I have never been able to see the sense of that. Because it is really, it is really saying that gene transfer across sexual barriers is unacceptable, and we shouldn't be doing it. [...] But conventional plant breeding has been moving plant genes across sexual barriers really, for a long time. [...] Now some would argue well that's fine, erm, but it's still between organisms that are reasonably related, in an evolutionary sense, and that is true. There's no way of getting genes from a kangaroo into... into a brassica plant, by normal sexual means, so clearly we can do things that are different, and therefore we need to ask questions about them. But you know the similarity of genes between all mammals is just astounding. The similarity of genes between all plants is astounding. [...] Erm... so you know, the question of... of... labelling foods, you know do we have a label on foods saying that this... this... plant contains a human gene, what is a human gene. [...] Erm, so in a biological sense there isn't much erm, reason to be concerned about human genes rather than genes from other kinds of organisms. So I think you can look at it in a scientific sense like that, and there isn't really much justification for.... in many cases for being concerned about this, and not being concerned about that.

This is not to imply that Alan has not considered the implications of his work in broader terms:

Now there are ethical questions of course which are different. You know, different kinds of criteria. For a vegetarian, you.... I had a vegetarian in my lab, and she... when I asked her if she would be happy about eating a plant with an animal gene in it, she said the question she would ask is Has an animal suffered to bring that about? It's not that she is particularly bothered about it being an animal gene, it's really the process leading up to isolating the gene and so on. And all these kinds of argument, you can keep pushing on, and asking more questions. If you want to look at a blood sample, from an animal, and isolate the gene from that, would that be a concern to you. She would say, well, you know, the animal hasn't had the choice to do that, so it's not always comfortable to have the genes that... blood taken out and so on. But if you then taken the argument further. What if... I'm quite happy to give some of my blood for this to be done. Would she then see that as a problem ,if that food contained a human gene. And none of these issues are simple and straightforward...

but these considerations seem to be of comparatively little importance to Alan; for him, mastery of technical detail is all-important. In the following, Alan is also challenged about the assumption that a lack of comment through ignorance implies consent. He acknowledges briefly that this is a problem, but it is clearly an assumption which he uses to justify his position:

Alan: [...] I think another one of the problems with interest groups is that many of the people don't have much good understanding of biology. Now that's not true of everyone, there are some er... accomplished biologists, but in general, the majority of them don't have a good knowledge of conventional plant breeding. So if they see the introduction tolerance gene to glyphosate, this is really dangerous. And if you then explain that herbicide tolerance has been a character in conventional breeding programmes for the last 3, 4, 5 decades, we already have herbicide tolerant varieties. Erm, and so many of the questions we're asking of herbicide tolerant transgenic varieties we could well have asked 30 years ago of conventionally bred ones. So many of the issues are not new, but they see them as new because they see that we're using different methods.

PQ: In a sense though, they're new if they haven't been talked about before.

Alan: Yes?

PQ: New to the discussion.

Alan: As a discussion, yes, that's true. I think you know, there is a difference in the sense that the number of herbicide tolerance genes that are available now is much greater, so er.. you know, one can justify a much sharper focus on the issues now, because er... we can take genes from.... there are I think nine or ten different herbicide tolerance genes that have been inserted into plants, and have been found that they work, they give tolerance to different herbicides. And these can potentially be put into many different crops. You.....

Alan then uses these technical considerations to illustrate the thoroughness with which his advisory committee attend to their task. At this point, he seems acutely aware of some of the criticisms which have been levelled by environmentalists against his committee, and is defensive of its work. This is illustrated particularly by his use of the term *holistic*, which sits uneasily with the remainder of the passage which is located firmly within the paradigm of industrial agriculture and reductionist biology. Later comments suggest that this is a genuine, but flawed attempt to engage with his critics, rather than merely window dressing in response to the interview situation.

You know, potentially you could put nine or ten different herbicide tolerance genes into oilseed rape, into potato, into wheat, and so on. So that raises quite a lot of issues, agricultural issues, and I think environmental ones as well, and that's what the [advisory committee] process is about, and we're wrestling with some of those. You know they're not straightforward, and people shouldn't go home, you know shouldn't have the view that we let everything through, it's just a matter of market forces. There are some very detailed and really quite searching erm, discussions on some of these, and... we don't.... we wrestle with them. There's only one herbicide tolerance that has been approved within Europe, and gluphosinate, and that's in oil seed rape. Now there are likely to be other proposals for different herbicide tolerance genes which we're wrestling with. We're wrestling with them before they're actually on the table, because we know that there are... there is material being developed, but we will have to make those decisions, eventually. We're sort of looking at all the pros and cons in preparation for that, and they're not simple kinds of questions, they're actually quite complicated issues, and involve, you know, it's not only molecular biology, it's not only whether the genes work, I mean whether

they're stable and whether they'll escape, it's the whole, holistic kind of consideration, if that gene transfers to that particular weed, or if those crops produce volunteer...if...

Alan then continues with a passage outlining some of the constraints he feels reduce the efficacy of his committee, hinting specifically about the impediments they place in the way of changing the direction of agriculture:

[...] you know, we can have grand ideas about trying to make statement about how we would like agriculture to be in the long term, but we have no statutory powers to influence that. And so we're reigned back quite a lot to what our brief is.

He then expands on this theme, describing in some detail a project he is involved with, and which is obviously of some importance to him, and suggesting that others on his committee and elsewhere would like to express similar ideas:

[...] many people on [Alan's advisory committee] and I suppose I can only really talk for myself, but listening to the discussions there, there are a number of people that do erm, feel that they would like at least to express an opinion on the sort of more holistic kind of issues. I'm just at the moment preparing a review for the [government department] on the more holistic erm... kind of considerations for transfer from plants, [...] and I said in the proposal that I wanted to take this holistic view, and not just to be policed to the particular statutory brief of [Alan's advisory committee] or other regulatory bodies. And they were actually very encouraging. [...]

Alan is deeply concerned by the harmful effect of industrial agriculture, a theme which recurs throughout the interview.

[...] talking to different companies, and different organisations, the British Society for Plant Breeding, and NFU and to the British Agrochemical Association, there is a... I've been really quite encouraged by how much of a move there is towards reducing the agrochemical usage, and dependency [...]

But another thing that seems to be driving it is... erm... in a way that I hadn't appreciated until a few months ago, is that the retailers and the supermarkets are having a much greater say in... in the way their products are produced... [...] and they're policing it by residues. They're requiring pesticide, fungicide, all the different er pesticide residues on the products that come into their shops. Now, there've been a few scares in the last year or two...[...] There was a carrot one with OPs¹, and so on, and if they get... if they... if this hits the press where er high residue amounts are found in produce in their particular supermarkets, then this is really bad for them.

¹ Alan is referring to Organophosphates, a commonly used group of insecticides. However, their toxic effects and the particular susceptibility of carrots have long been known. See for example Carson 1991 (originally published 1962) pp 41-45 on Organophosphates generally and *ibid.* p. 66 for carrots specifically.

[...] And I... as an individual, as somebody that lives in the countryside, and live next to a field that has been wheat, pretty well continuous wheat over the last 12 years - they've had two crops of beans there in that time, and it's sprayed quite a lot of times, I find it quite appealing to find ways to reduce our dependence on sprays and agrochemicals generally. [...]

but this concern is expressed always through the lens of industrial agriculture. For Alan, his misgivings about agrochemical usage do not constitute a fundamental challenge to the methodology underpinning it, but an adjustment to that methodology to reflected new priorities. Alan's concern about this, and issues such as long-term testing of transgenic crops seems to be the site of some conflict. On the one hand, he defends his work as a geneticist and as a part of the regulatory process, while on the other hand expressing grave concerns about the issues raised by his critics:

Alan: [...] I do have a question mark in my mind about the long term influence of putting tons of pesticides into the environment, but the erm... the assessments that are done, OK, they're very thorough, and they er... they don't run over generations, they don't run over decades. And I think those kinds of experiments, those kinds of analyses are difficult if not impossible to do over the timescale that that... is necessary for an assessment. Now legitimately I could ask myself the question, well, the people that are concerned about genetic engineering, isn't that also a valid... question or concern, what is the long term impact. And I think it is. I think it is. I think that... we must have a way of monitoring the long term effects of transgenic plants, and we must as regulators not wash our hand of the decision once it is made, we must maintain an involvement, an interest in it, erm... now.... in a way... in a way this sort of long term view with transgenics is a bit of a weakness in the regulatory process, because... this is something I've been trying to develop in this thing I've been writing, erm, we... when we give approval for small scale field trials, we ask for monitoring to be done, and for the company, or the organisation to report back over 1, 2, 3 years. The commercialisation up to now, we haven't... we haven't required that. Now it's not quite as simple as that, because there is a duty of care put on every approval, so if a company... if we give approval to a company to go ahead and commercialise, there is a statutory obligation on them to report back if anything undesirable happens. But there isn't... I feel a bit uneasy about that because there isn't an obligation... there isn't...

PQ: What, to monitor for that?

Alan: There isn't a defined obligation for them actively to go out and search. Now in a way you only see what you look for.

His uneasiness extends to include political issues, for example the integrity of scientific data supplied by industry, which he indicates is often presented in a way which precludes verification, raising doubts about its validity and the agenda of the company involved:

[...] when I go to scientific meetings, and hear papers from companies, I always feel very dissatisfied... that... well I guess I have a suspicious frame of mind

anyway, I'm not happy unless I see standard errors, and see what sort of variation they find in their numbers. Because you would expect, by chance to find significance, occasionally even though there isn't a significant effect. Erm, and unless I can get a feel for the data, I always feel a bit suspicious.

The interview concludes with a specific question about environmental values, although Alan has hinted at these throughout the interview. This is a topic about which he speaks with ease, and without further questioning, makes an unambiguously ecocentric statement (in italics). During this passage he makes a clear link between his personal convictions and his professional work, illustrated by an example of the type of work he would find ethically unacceptable.

PQ: [...] would you say that you have environmental values? I certainly get the impression that you do.

Alan: I have erm... I am... it sounds a stupid thing to say, but I am a person like everyone else, I have an environment, I am concerned about the environment that I live in, that my kids are brought up in, and my grandchildren are brought up in. I see that we are stewards rather than we have any influence, and that probably is not for too long if we're lucky it's sort of a decade or two where you really have some influence on the decisions that are made, and I think that as a person and as a scientist that understands probably more of the principles involved than most people, I think that I and we erm.. have a responsibility to make sure that we take care of things, and the environment of you know human health, and the quality of life generally. *Not only for people, but living things generally.* So I... erm... I feel very strongly about that, and that's why I feel very strongly about the [advisory committee] involvement because.... I also believe very strongly that the science, and there are 750 people working here, and many of them of genetics, and genetic modification, and understanding the process, I think the future is best served by making sure we develop and apply it very carefully and responsibly. Now some would argue that I have a vested interest in all this. Lots of people's jobs, and if we don't do that....

PQ: And it's your life's work as well.

Alan: Yes.

PQ: Which is important to anybody.

Alan: Yes that's right. It's about stewardship I think. That's the best way of putting it.

PQ: So do you think it's fair to say that there is quite an explicit linkage between the ideas that you've just explained to me. Does the one drive the other at all?, or would you compartmentalise it?

Alan: The one influences very heavily the other. Erm, you know the word you use... you can use all kinds of words, but I... I would find it difficult to work on certain things, because I see them as not helpful to society. I would... I would find it very difficult to work on tobacco breeding, for producing tobacco for people to smoke. If it was tobacco to produce pharmaceutical substances, I could do that. But I would have on an ethical, moral grounds, I would have difficulty doing that. I would erm... I don't have problems with herbicide tolerance, now some people have problems with that, because they see that that could lead to increased dependence on herbicides. But when you look at it carefully, it is likely to have the opposite effect. I talked with a biochem... I talked with a sort of herbicide producing chemical companies quite a lot, and I listen to their arguments, and this is the line they take, and I think it's not just hype. There are a lot of attractions for putting in resistance to particular herbicides. Particularly the very environmentally friendly ones. In oil seed rape, which is the crop I'm familiar with, or cotton is a really nice example,

erm, it was on farming today the other morning. They use about nine different sprays... sprayings to control insects, and with the Bt cotton, they've reduced it to 2 or 3. Now, you know, that is appealing because it simplifies... it reduces spraying, but it simplifies management. Many of the chemicals they're using, like some of these broad spectrum herbicides are really very friendly relative to some of the older....

Throughout the interview, Alan seems to be wrestling with a conflict between his work and his value system. Sometimes any potential conflict is easily resolved - he would not for example work on tobacco plants for smoking, and is prepared to confront the vested interests of the agrochemical industry which he sees manifest in deliberately opaque scientific papers. However, much of this conflict is less easily resolved, an impasse which seems to stem from his technical background in industrial agriculture. From this background, he can advocate incremental technical improvements; in the last excerpt he describes the use of genetic modification to facilitate the use of less damaging herbicides. However, this partial solution still requires extensive use of agrochemicals, and an increasing use of monocultures, which are contrary to his environmental values. Alan does not have the technical knowledge John (see section 5.5.1) uses to reconcile his vision for agriculture with his value system, and so is unable wholly to resolve this conflict. At the time of writing, increasing consumer interest in Organic produce is leading to greater interest in the technique from the food industry. It is possible that this process will allow John's knowledge to become available to Alan, and spawn greater research into making Organic agriculture more productive in a modern agricultural environment. It is possible that such a process would allow Alan to resolve his internal conflict.

6.2.3 Case Study: Simon

Simon is a high ranking clinical geneticist, but is deeply concerned about the application of the technology to food and agriculture. Therefore, despite being a practising geneticist, he has become a scientific adviser to various groups opposing GM food, and also appears frequently in the media explaining his opposition. His inclusion in the project relies upon this aspect of his activities being considered professional.

Simon begins by outlining the purpose of his clinical work:

Simon: [...] To use genetic engineering in a clinical context is one of our objectives. One of the objectives for example would be to use it to produce drugs more cheaply which are purer and safer.

PQ: Yes.

Simon: The other is to develop components that would be used in a what we call a somatic² gene... human gene therapy context

He continues by describing his feelings when, having been approached by a campaigning group to advise them, he undertook some research into how the techniques of genetic modification he was familiar with were being applied to food and agriculture. These centre around the crudeness and unpredictability of the technology, which he considers to be acceptable when there is a clear benefit, where there is no release of GM organisms, and where the recipient of the treatment has a choice. Clearly in agriculture and food, the second and third reasons are absent, and Simon feels the first is also absent.

They [a campaigning organisation] approached me in the first place and then I have to admit to you that before I was called, I mean I knew generally what was going on but not too much detail and certainly I was ignorant of the extent of what was going on in terms of genetically engineered crops. And, so really it was a bit of an eye opener for me. When I was called in to give advice and I began to just as a technical expert on what genetic engineering is I then began to go into the subject more and find out a bit more for myself, the extent to which er, things have progressed and the more I looked, the more horrified I got because I had not realised just how far things had come. [...]

Technically speaking, er, it is a very crude and imprecise technology with erm... a huge unpredictable component to its outcome and therefore all the claims of precision and so on, er, that are made by the proponents of its use in

² The term *somatic* refers to non-inheritability. Thus any genetic changes made would not be passed to future generations, and considerably reduce the risks run by adopting such techniques.

food production... I find those scientifically untenable and basically... er... it's just a joke.

Simon spends some time elaborating on this theme, dwelling particularly on the regulatory system's failure to question the validity of GM food and agriculture, which he contrasts with its actual activity which is to look for predictable adverse consequences.

When the discussion moves on to the broader ethical considerations, Simon seizes the opportunity to make a series of unambiguous ecocentric statements, a theme he returns to again and again during the interview. The following short excerpt, which is one of many similar statements in the transcript shows that this is something in which Simon passionately believes:

Simon: [talking about the idea that the ethical debate should be settled before the science is discussed] Yes I do have some sympathy for that, there are many groups that I feel can.... justifiably reject the use of genetic engineering based simply on a matter of principle.... their principles.

PQ: People like the Natural Law Party.

Simon: People like the Natural Law Party or the Soil Association, in other words the Organic Farming Movement, erm... and all those groups like the Friends of the Earth, and Greenpeace who feel that erm... life is a sacred thing, which it is, and that it is something... which... er... nature as a whole, and nature is something we need.... we are a part of nature and we need simply to be able to learn to work with nature. The term nature is a very vague thing...

PQ: Yeah.

Simon: But there are all these groups that see that, where we are going wrong generally is that we view life as a fight against nature as a struggle against our surroundings, [pause] whereas, there are others that would say that no, where we're failing is, [pause] we are lacking in our understanding and ability to work with nature. Erm, after all we are all a part of nature, this is why I feel... er they have... some people have forgotten this point. Mankind is a part of nature, we are part of one huge biosphere, one ecosystem so one and so forth. Which means that if we are fighting..... nature we are in effect fighting the very system that we are a part of, in effect we are fighting ourselves. This is why one of the Soil Associations quotes is that "if we win the fight against nature then we would be the losers" and they are absolutely right.

Questioned more explicitly about the link between his ecocentric values and his work, he expresses his values as a limiter on his activities rather than a driving force. He appears not to be a geneticist because he is an ecocentrist in the way that Mark and John have chosen their careers, but limits the scope of his activities within genetics according to his values. Simon re-iterates his ecocentric values here, but on this occasion uses it to link in to a description of what he sees as the wider context of his work. He devotes considerable time to how he feels his

science fits in to his wider, more holist world view. Note here the contrast with Eric, also a geneticist, who dismisses holist arguments.

PQ: [...] there appears to be quite an explicit linkage between your personal views and what you do in your professional capacity.

Simon: Yes, I would say there is. Erm, I wouldn't go beyond... a certain point basically with my work because of.... the.... intrinsic respect I have for nature....

PQ: Uh-huh.

Simon: Erm..., I feel that... I... I feel I'm a part of nature and I will learn from it rather than seeing nature as something to be conquered...

PQ: Yes.

Simon: And to be beaten into submission, erm..., so past a certain point I try to.... how do I put this best.... try to keep a very broad, interdisciplinary kind of a perspective on my work, erm.

PQ: When you say interdisciplinary do you mean with other branches of science or beyond science?

Simon: Even beyond science to include philosophical systems erm... about life for example, that goes back perhaps thousands of years and that sort of thing, yes... I feel there is a subjective means to gaining knowledge as well as a objective means through experimentation to obtain knowledge, and I think both are.... complimentary.... and so past this, and I feel that there is a... anyone who is half awake I feel should appreciate that there is an inherent intelligence of the basis of nature otherwise it wouldn't display the order.

PQ: Em, a sort of Gaia type idea.

Simon: That's right. [...]

Simon's categorisation as a conflictual respondent rather than an ecocentrist rests on the assumption that to do genetic modification is anthropocentric. This assumption has been explored in Chapter Three in relation to food and agriculture, but clinical applications fall outside the scope of this thesis. Despite his activities against GM food, it can be argued that knowledge about genetic modification, from whatever source, has wider applications, over which the researcher has no control. It is therefore unrealistic to expect clinical applications to be taken up while agricultural ones are not; the two (or more) come as a 'package'. Predictably it is here that the discontinuity between Simon's ecocentric values and his work within *clinical* genetics lies. Although this discontinuity does not extend to his work within food and agricultural genetics, it is the clinical side which gives him the professional credibility he needs to be an effective critic. The two then cannot be taken in isolation. The following passage explores this theme, and although the question is somewhat rambling and badly worded, Simon explains that he considers the benefits of his work outweigh the problems of possible misuse (on his terms) of his work. The detail with which he answers this question illustrates that this is an issue which troubles him,

and he has clearly not taken the decision to continue with his work lightly. At the time of the interview, I was not aware of weapons applications of the technology, which would have made a useful supplementary question.

Of note here is an argument Simon does not use. He could have claimed that the work would be done anyway, so whether he does it or not is immaterial - and his mention of funding would have lent support to this argument. However, he does not attempt to deny responsibility for his actions - quite the reverse, he clearly takes it very seriously.

PQ: I was talking to somebody a few weeks ago who is opposed entirely to [...] genetic engineering per se regardless of its applications, and the argument that they used and I've heard it used in other contexts and I'd be interested in your reaction to it because you obviously disagree with this point of view, is that whilst in clinical areas it appears to be a technology which is useful and probably a good route to take if you like, the problem is that the knowledge which has led to that... exists. Once you create it you can't control the way in which it's used, it's as though the knowledge comes with the package of applications and you can't show people to ones that you want, the clinical ones without getting the ones you don't want, the agricultural ones. Do you have sympathy with that because that kind of undercuts a lot of your work I imagine?

Simon: Yes, erm... I can see their point, there is not a perfect policing system in the world is basically what they're saying, so even if you had the most strict regulations, which channelled this work down the few clinical paths, erm... where it can clearly be derived, erm... you can't stop somebody from abusing the technology for some other purpose. I can see their point, but at the same time I would argue that, that there are still millions of people there that need something to help them and at the moment, the production of drugs or the use of gene therapy would appear to be the only option that we have. Now if somebody came along with something better then.... that did not involve this then I would need a... you know, I would go for that. Erm... as well. And we are working... I mean, I have a gene therapy programme here I'm involved with: a European funded Gene Therapy Program, which also runs in parallel to an alternative, which is where... to use drugs to manipulate innate gene functions rather than manipulate genes by introducing new ones or changing them. By simply using drugs to modify innate gene functions you can make-up for a deficiency that's there from birth.

PQ: Yes

Simon: Erm... we erm... see that as an alternative or and are running that in parallel to actual gene manipulation based therapy, erm... and so... no, I would be... perfectly accepting to drop the genetic engineering if more viable alternatives came along. At the moment though, it's erm... there isn't, I would say clear alternatives that are obviously going to work, if you see what I mean, erm... and so we need to carry things in parallel in the hope that one or the other does. If both do, then we choose the safer and cheaper and more easily applicable one.

PQ: Yes.

Simon: So I fully appreciate the worries people have about that, it's something that does worry me. One of my greatest worries is to see my own work being used for purposes that I am against. That is a worry and.... I am sure I may face that in the future at some point, if we're not careful. One of the things that worries me in a sort of clinical context is that fact human germ line manipulations have not been banned generally, only five countries in the world

have actually banned manipulating the human germ line. The UK is not one of them, erm... so my worry is that the way things are at the moment, erm... many people, including some very eminent scientists are seeing manipulation of the human germ line as a viable option in the future when the technology gets... would be considered more precise and more accurate and so on. Now that's one thing that I clearly find, erm... wide open to abuse, for eugenics applications.

Simon pre-empts a point made by other interviewees hostile to genetic modification, that many of the ailments it seeks to alleviate are preventable. He re-iterates the link between his values and his work by outlining clinical areas he would not work on for that reason. However, he does not extend that argument, as was done by other interviewees to suggest that given the limited resources allocated to encouraging beneficial lifestyle changes, giving funding to clinical genetics, even in the absence of alternative treatments for specific maladies seems inappropriate.

PQ: [...] I want to make sure that I've understand exactly what you're saying, you operate according to a set of core principles and values if you like and everything on a more every day level has to tie in with those values or you do something else which does tie in with them if you like. Does that explain what you do or am I putting words into your mouth.

Simon: [pause] Yes, I would say there is definitely a set of core principles, erm... dos and don'ts as well as moral values, ethical values that erm... that do guide, that do guide me and I select my work that fits in, I would only study certain things.

PQ: So it's always a very explicit linkage between the two?

Simon: I would say yes, but there are certain areas in research that I would not personally study because it doesn't fit in with my erm... what I feel, erm... addressing the questions correctly. Let me give you an example erm... there are certain diseases which I feel are on the whole preventable but there is huge efforts been expended to try to find cures for them, now that for me is very much a situation where erm... to try and shut the door when the horse has bolted erm.... I also feel its a crime against life to allow somebody to fall ill first before you try to do something about it, and I feel that's the situation where we are for example with cancer and cardiovascular disease. I'm not saying we shouldn't try to develop technology and help people that suffer from these conditions, quite the opposite, but one of the things that we must appreciate in conditions like that which only takes a secondary consideration at the moment is that they are preventable conditions, so what we should be working first and foremost on, is to prevent, to educate people and to change work on changing society to prevent conditions like that from materialising in the first place, rather than, just accepting the fact that they will happen, and then trying to go for curative approaches as a first line measure. So I took decisions quite a while ago, erm.... I would work on things what I felt that there were no clear alternatives but to try and work on the problem after it had arisen, like in genetically inherited disorders. Erm... so.... that's.... those sorts of things erm... make me decide on what I shouldn't erm... and that I would focus on as part of my work, and as I say, past a certain point I wouldn't.... again if somebody asked me to erm... to work on genetically engineered animals for food production, I would say no. You know past a certain point I would not do something, again because of the core principles that I hold erm... as my overall guide in my life.

A clue to how Simon came to be facing this dilemma comes from a section where he is describing how he came to be a geneticist. It seemed to come about purely from an intellectual interest in the subject matter, with awareness of the context coming later. Simon seems to have, at least to some extent, created a Naess-style normative structure, starting at both his professional activities and his values, found a discontinuity and attempted to resolve it by speaking out against food applications of GM technology. However, the above passages indicate that he is perhaps not entirely comfortable with his arguments; it seems to be a resolution which has not completely convinced him.

I developed an interest in genetics while I was an undergraduate, erm... at. [...] and the broader implications of it sort of matured after, if you see what I mean because I don't ignore the philosophy of life I.... I.... I appreciate that there is more to life than the molecules that people like me play with erm...

Simon seems to have created for himself an awkward conflict between his values and his work. He is an extremely thoughtful and perceptive individual who is clearly well aware of criticisms which can be made against his work, and although he defends his work, he does not seek to deny the validity of those criticisms. Within the admittedly small sample used in this project, Simon is unique in the way that he expresses and gives credence to the views of his opponents, even agreeing with them. Simon is also unique in that he speaks out against another branch of his own profession, and it is perhaps here that the resolution of his conflict really lies. His criticism is only effective because he speaks from *within* conventional genetic modification. Without this platform, he would be one voice among a multitude of dissenters, and it is easy to imagine this providing Simon with the moral justification he needs to continue his work.

6.2.4 Other Scientists

Two conflictual scientists, Dennis and Emma, have no vignettes. This is because of the similarities between their interviews and the other scientists reproduced here, in particular Eric and Alan. It was felt that owing to the length of this chapter, the benefit to be gained from presenting vignettes with much duplicated material was outweighed by a need for brevity. For the record, both are academic biologists (identifying their specialisms would compromise anonymity) who also work in the advisory committee structure.

6.3 Food Industry Representatives

The majority of interviewees from the mainstream food industry are in the anthropocentric category, but two, Jim and Marie have been classified as conflictual. Both work for large companies within the industry, and have no other professional role applicable to GM food.

6.3.1 Case Study: Jim

Jim is a senior representative of a major UK food manufacturer. He is a perceptive, thoughtful and personable individual who was keen to engage with the material in the interview. The interview took place in his office.

The introduction of genetically modified food is clearly something which Jim and his company have considered in some depth:

[...] but give the guy [Professor Richard Lacy] his dues, if nothing else, he made us sit down, and say well (a), what is he saying, have we got it right internally, and we spent a long time at [his company] saying are we right to take the stance we're taking, and we were questioning...[...]

[...] I have been with a group in [his company] who actually are leading our attempts to... you know... understand it, rationalise it, use it, suchlike.

Perhaps not surprisingly in an industry which historically has embraced new technology, Jim is not against genetic modification, but he has to be given a good reason for using it:

We will not use it if it's just scientific adventures. Somebody says scientifically we've done that development, isn't it exciting, do you mind using it, I'd say, no we won't use it.

[...] there is a real reason for actually doing that [Zeneca's tomato purée], because the consumer has better value for that particular product.

However, this pragmatic approach is tempered by Jim's (and others within the company) personal feelings about the technology:

[...] Oh make no bones about it, I think this is very spooky science.

[...] it's interesting to see our chairman, [name], he's not scientific at all, but he keeps saying to me, this is bloody spooky stuff. You've got to help us through it.

It is evident that Jim and his company's position has evolved over time to be more sympathetic to developments driven by the agrochemical industry on the basis of the benefits humble beginnings may yield in the future:

[...] it is an iterative process, and you've got to start somewhere, and the agronomics, the agrochemical area is the place to start I would imagine. I mean it won't be long before the food industry are actually saying to the geneticists, we want a crop which does this, this and this, er I mean it's already started to... say on peas, we are... the food industry deals a lot with peas, to modify the starch within the pea both in quality and quantity which therefore gives us an advantage. So that's the food industry driving it, as opposed to the agricultural, no sorry, it's the agrochemical industry driving it.

This attitude extends to the biotechnology industry, where Jim's' irritation at the introduction of their Soya Bean is combined with some sympathy for their perspective:

The thing that [biotechnology company] said is, they were arrogant and said look, we believe it's safe, you haven't got to worry about it, therefore we mix it all together. That was the problem. So that's got nothing to do with the science, that's all about how the thing was handled, and it was handled appallingly. No question about that. [Biotechnology company] were... they just hijacked the whole food industry.

[...] from that point of view I think we were seriously let down. I mean, in fairness to [biotechnology company], I mean I think you have to try and be understanding from their point of view, you see they would argue that if they had done some genetic manipulation in the old fashioned way by crossing Soya crops to produce a new.... they wouldn't come to us and say here's a new

variety which is x, y, z, I mean they just wouldn't do anything, and that would have been it. Because they argue you see that the actual bean is in no way different in functionality terms, in chemical terms, er... physical terms than the bean from a non genetically modified source. So from their point of view you see, they could argue that they were... and I mean genuinely they'd done all of the work, and er.... I mean we're going over to the States to spend a couple of days with [biotechnology company], not too much on Soya, but really on some of the other big issues they've got coming through, because we don't want to get caught again! In that sense. Er... but.. so in fairness to them, they would have done all that work, and they would say well that bean that's actually going into the Soya market is... is in no way different from the standard bean other than it has one gene which has been slightly modified to be....[...] I mean we all sit here pontificating, [biotechnology company] are a load of shits you know, but actually, you know, if you're honest with yourself, I think perhaps you might say OK perhaps they weren't as clever as they should have been...

Jim's attitude to genetically modified food is dominated by his vision of progress, the benefits of technology and the legitimacy of different actors. His joking references to living in caves reveals a belief in the benefits technology has already bestowed, with the extrapolation from that that further technological advance will yield further benefits:

I think that is arrogant, [banning GM food] I think it's trying to stop progress, and I think it will just lead to the thing being driven away from responsible, thinking, ethical people, into back streets where people will be doing things without telling us.

You turn round and say you don't need it. I mean if you take that, we could still be in caves, with clubs.

However, for Jim, genetically modified food is almost a moral imperative, which over-rides his own worries about its 'spookiness' and other similar concerns because of the need to feed the poor. The argument he uses here seems to reflect the legitimacy he feels different actors in the debate have. Although he indicates that his company is now far more willing to enter into dialogue than in the past (see below), the legacy of their historical position appears to be a prioritising of the arguments put forward by the biotechnology industry, in this case their view of the potential for GM food to solve world hunger. Later in the interview he confirms this by explaining about a visit he has planned to the US headquarters of a biotechnology company. He appears to have no such close contact with opposing groups, or indeed with specialists in food security issues:

[discussion of Norwegian consensus conference] so they're saying stop the research, but what about all the people in India, in China, in Africa, who

haven't got enough, who are starving. They're prepared to sit there and say, I'm not going to get involved. I think that's absolute nonsense.

Jim underlines this difference in credibility and attention he gives to the different groups in the following statement where he misunderstands the position of the environmental movement with regard to hunger, while accurately reproducing the arguments of the biotech industry:

Well, I do, you see this is what annoys me intensely with the [environmentalists] and these sorts of people, who are saying.... All they look at is the science in relationship to themselves and us in the western society. This science of genetic modification has, I believe will have the greatest [positive] impact upon the world as we know it, and it will be the science which has the greatest impact for the last 100, 120-odd years. Almost since penicillin.... almost. It will have an enormous impact upon the world. And I don't believe the answer is to say stop I don't want it.

The mismatch between Jim's desire to understand and engage with all points of view, and his apparent success in doing so is perhaps partly accounted for in his company's changing attitude towards participating in such debates, and thus may resolve itself with time:

I mean there was a time when [Jim's company] wouldn't put it's head above the parapet at all and talk with anybody. We've changed quite a lot about that, but we are still very very reluctant to be trailblazers and to lead the way. We will answer, we will respond, but we won't trailblaze

Jim's willingness to engage with other opinions is illustrated when he is challenged about his opinion of environmental groups:

Jim: [...] the environmental groups really have no responsibility whatsoever. They are just free agents. Professor Lacy is a free agent, doesn't matter if he's wrong, he can say the most outlandish things, and it doesn't matter, because he can either go underground for a few months, or he can put some sort of apology which appears on page six on the bottom line.

PQ: When I was talking to the guy from Greenpeace, he was going on and on and on about their problems with Brent Spar, you know when they did the chemical analysis and they got it wrong, they have taken so much flack over that, I don't think it's fair to say they can say what they like and get away with it.

Jim: OK, well it's a bit of a sweeping statement, but I mean it's a sort of.... what I'm trying to say is the analogy we have got is that we employ 25,000 people, so we have a responsibility to them

and when he describes a telephone conversation with a concerned member of the public:

Jim: [...] We had a guy on the phone a couple of months ago, [...] I explained what we're doing, and I said my view here is not convince you you're wrong, it's to show you that we've thought about it, we're doing our best in the circumstances of the decision, and so at least you'll go away and say, well at least they're giving it some serious thought, rather than [being] cavalier. In defence of the guy, he had the grace to say look you know, I hear what you're saying, and I respect you for it. I don't agree with it...

PQ: Do you find dialogue with people like that constructive, or are you just talking at cross purposes?

Jim: [long pause] It's not constructive, in the sense that you know they are totally on this emotional plane, erm, but you see to some extent, I wouldn't want to destroy that, and the reason why is because, when you're in an industry which has a particular focus, which is producing food and making money, there are times when you actually do get... you know, your pendulum swings too far to one way, and it's good to have somebody who's completely nutty and emotional with the issue, because it brings you back to say, well wait a minute, have we really got this right?

This use of emotional arguments seems to be a real source of conflict for Jim. On the one hand, he clearly finds such ideas difficult to assimilate professionally, and is tempted to reject them. However, on deeper reflection he seems to have personal sympathy with such views, and concedes that they are a useful input, and perhaps even a constraint on his professional activities. For example, when the dehumanising effect of science is discussed, Jim agrees that it is present, although probably necessary, and believes that consensus conferences are a useful way to complement the output of scientists.

When talking about environmental issues in more general terms, Jim is aware of the damaging effects of some of the technologies he uses, and feels a responsibility to reduce his use of those technologies:

I mean I've got, you know air conditioning in this office, but I use it as little as I can, and open the windows. That's a small contribution to... But I think if people thought like that, sensibly, I think [things would be better].

In more general terms, he uses a similar argument to put forward a model for societal change:

[Jim describes John Prescott talking on the radio about simple water saving measures] That's the sort of area where I think we should be better citizens. Rather than all becoming hair shirt brigades. Some people want to do it. Fine. Good luck to them. But that's not my style. But I still think I can be as good a citizen helping to save the planet, than going to the extremes of living in caves.

This passage locates Jim as a technocentrist - here he is presenting the solution to environmental problems as lying in the realm of minor changes within the dominant paradigm, while rejecting more radical lifestyle changes. Jim then goes on to having great difficulty engaging with ideas of biodiversity loss:

PQ:: [Talking about biodiversity loss] Do you think that that is important?

Jim: [long pause] It's a good question.

PQ: I mean does it matter? can we set up gene banks, and then biodiversity is kind of irrelevant?

Jim: That's a good question. It's interesting in our booklet, we say one of the problems is that it will actually reduce biodiversity in the physical sense, in the sense that there will be less types of wheat about, but that doesn't mean that you couldn't set up gene banks, where you couldn't bring those types of wheat back in, if you wanted to.

In the above passage he relates the problem only to diversity of food crops, but despite numerous prompts and other suggested examples of biodiversity he may be familiar with, he seems unable (although not unwilling) to move beyond food crops:

Jim: It [biodiversity loss] has enormous economic implications.

PQ: Oh yes. But do you think it goes beyond that. As an individual, does it bother you?

Jim: What? Does what bother me?

PQ: Whether.... Well if it's true what the sceptics say that this technology will reduce biodiversity, [...] as an individual, is that an issue for you? Do you like walking in the countryside and looking at...

Jim: Yes, but I don't walk in the countryside saying that's a strain of XYZ rape, that's a strain of ABC. No.

PQ: No, of course they don't, at the same time you can perceive a difference between a natural, if there is such a thing, woodland and a forestry commission plantation, where it's rows and rows and rows of conifers. And you're not thinking, oh that's an x tree or that's a y tree, but you are aware of a level of naturalness if you like that's absent in the forestry commission. I know this is getting rather abstract, but it's quite a difficult topic to talk about.

Jim: Er, as a scientist I would say no. I suppose one has an innate feeling as a scientist that we will always find a solution to the problem. A sort of a child-like belief that's what scientists will... always come up with the answer for the next problem to come.[...] And I wouldn't say it's a worse place to live because our conifers happen to be straight rows, rather than higgledy piggledy.

Jim seems to be consistently articulating a technocentric/anthropocentric mindset, although his description of technological optimism as 'child-like' hints at the following passage, where he is quick, not only to articulate sympathy for an ecocentrist position, but point out how such sympathies clash with his anthropocentric lifestyle and earlier statements:

[Talking about the intrinsic value of the Giant Panda and rainforests] No, I understand that, I suppose it's having a responsibility to things that are God given on our planet, and how we are then destroying them for our own selfish aims, and I think that's a fair.... there is a fair argument in that, and one that I would support. But the difficult thing I find about it is it's difficult to support that without appearing to myself to be slightly hypocritical. Someone could say, well what are you doing about it.

The ease of his response contrasts markedly with the difficulty he had answering questions about biodiversity loss; he gave a strong impression which was absent elsewhere in this part of the interview, of articulating something which was already clear in his mind, and about which he had formed a considered opinion. It is quite possible therefore to locate Jim, at a fundamental level, as an ecocentrist, in contrast with his more everyday activities and views which are firmly anthropocentrist. The narrative structure Jim uses to maintain this contradiction appears to be rather unstable; he hints himself at the weakness of some of his arguments, is aware of the contradiction, and throughout displays a willingness to consider other views. However, the most important aspect of Jim's narrative structure is the moral imperative of feeding the hungry. It is possible that confronted with the emerging consensus that GM food will not solve this problem, that Jim's argument will collapse, and he will oppose the technology using arguments based on his ecocentric sympathies. Perhaps a more intractable practical problem for Jim would be reconciling such a change with his professional position, although he mentions retirement during the interview which would remove the difficulty.

6.3.2 Case Study: Marie

Marie works for a large conglomerate involved with importing GM commodity crops. The interview took place in her office at the company's UK headquarters.

Marie's company have found themselves criticised as part of the group of companies considered by some to be forcing GM food onto the UK market. Their low profile has tended to deflect much of this criticism towards the biotechnology companies, but nevertheless they have often been considered to be a part of the same group. Marie's perception of this however is different; she presents her company as being caught in the middle between the producers of GM food, and the retailers and manufacturers who she portrays as hypocritical. Like the latter group, she considers her company to be a passive respondent to market forces and the actions of others.

Marie: [...] I think, when you say they're [retailers] quite cross with the way we're doing it....

PQ: It's [biotech company] particularly they're annoyed with....

Marie: Well exactly....

PQ: But you do form a part of that approach

Marie: Well you may think so, but we ourselves if you like, we're annoyed with what was happening

PQ: Well that's interesting

Marie: Because We're in the middle of this, we not at that basic end where the decisions are taken to release the new technology, and I think there has been some perception which we have tried to correct that we ourselves, we are responsible for the way this has happened, where is the fact that isn't the case and we would not have been in the position to do it.....

PQ: Yes. OK. One of the first interviews I did, some time ago now, was with [retailer], I imagine you've heard about their stance with this, it's quite.....

Marie: Yes we're actually a supplier to [retailer].

PQ: Oh are you, that's interesting.

Marie: Yes, we are a supplier of chicken, we own [subsidiary] which was a chicken business in fact, in [location]. Yes I have heard about [retailer]'s stance, I have been in meetings with the people from [retailer]. Their public stance does not match up to what they put in their supermarkets - it's as simple as that. Soya meal for example is a major component of chicken feed and there's no secret about that whatsoever there is no... I mean we had... made it very clear that the Soya meal that we're supplying to the people at [subsidiary], some of it is American Soya and therefore must be regarded as genetically modified, and the [retailer] technical people understand this perfectly well, and they have not made an issue of it.

Moving on to talking about her company's relationship with protest groups, Marie makes a number of points. She finds Greenpeace particularly difficult to

deal with coming as they do from a fundamental, principled objection to genetically modified food:

[...] although I have been in group meetings where the Greenpeace representatives have been present as well, I think, it is quite difficult to have..... a dialogue with people coming from..... a standpoint of principle which is basically opposed to genetic modification, erm... and then for us where we, well we can discuss all sorts of the practical ways you might introduce these products into the market, but to start from a position of being opposed in principle, that makes it very difficult to have a practical dialogue.

This appears to mirror some of Brian's comments about such groups, but whereas Brian presents his company's actions solely as pragmatic and science based, Marie also talks about the importance of principle to her company:

Marie: It's because we're working to our own principles, and our own principles are to do with, in a way providing as much food as we can at least cost as we can to consumers. I mean that is actually one of, one of our statements of principle if you like, that arches over the whole company, we actually believe that partly because of the way we do business, and partly because of our efficiency we can actually for example, get a boat of Soya beans here more efficiently than anybody else and that means European food manufacturers have access to Soya at a lower cost than they would otherwise do, and therefore, as part of a chain reaction making a contribution to generally feeding a lot of people, and that's our stand of principle..

PQ: Does that have credibility within the company or is that something you had as a kind of banner

Marie: Well it is a banner, but I think it's, I think it has very much credibility in the company, it's not just something that just stays there, it's something that's discussed quite a lot and also there have been attempts to review it and actually the reviews have not got rid of it because if people come back to it as actually one of the principles that we do think, a lot of other businesses are working towards, so.... I mean...., in terms of doing that, I mean and getting food to people day by day, on a cost basis, well it is quite a pragmatic principle, if you like, we actually feel there is something of principle there, so that when people have difficulties with that, whether we should be doing this at all, we have weighed the subject up against our own principle and believe it is part of working to produce to that principle so that's why we do it...so there is some principle behind the pragmatism if you like...

After a description of Kempton, Boster and Hartley's work to introduce the notion of widely held ecocentric values, Marie responds without surprise, and attributes the apparent conflict between ecocentric values and anthropocentric lifestyles as a reflection of the demands of modern life:

but it doesn't surprise me at all that a lot of people hold similar principles to something like this, I mean a lot of the time it's whether people can be bothered to do anything about it and how much time people want to devote to thinking about it or just getting on with the rest of their lives, and a lot of people, it seems to me think they have much better things to do with most of their lives than getting involved in discussions of principles, but the Greenpeace supporter

is someone who believes that action is very important, and therefore gets involved and does it..

When using the value of biodiversity to introduce a discussion of Marie's attitude to nature, she immediately makes an unexpected comment about the nature of commercial agriculture. Rather than try to make genetic modification appear harmless by presenting it as an extension of earlier, benign technologies as might have been expected, she portrays it as negative, and a part of an historically negative process. This portrayal is an incomplete view of her conception of industrial agriculture; recall her enthusiasm for her company's involvement in the production of cheap food. However, this excerpt indicates an unease with the exploitation of nature by current agricultural systems.

Marie: I think it's [biodiversity] quite important, I'm not sure whether this technology [genetically modified food] is something that's very important to discuss in relation to biodiversity, or whether you should be looking at your whole system of commercial agriculture which affects biodiversity, of which this is a part

PQ: Yes

Marie: I mean, I think I would probably not single out biotechnology as being a particular issue with biodiversity, I think it's a much bigger issue, it's the whole issue of commercial agriculture and you have to look at it in terms of weighing what are the alternatives. [...]

Talking about her reasons for worrying about the loss of biodiversity, Marie argues that humanity may lose potentially useful species; a commonly articulated anthropocentric argument. However, she also indicates that removing this threat would reduce rather than remove her worry:

Marie: It worries me because I think the future potential for discovery, what ever, will be permanently lost, I mean if they are preserved in some way..., maybe an experiment in research places..

PQ: Do you mean gene banks and things like that...

Marie:I mean, then I would have less of a problem,

Discussion of Marie's ecocentrist sympathies is dominated by her inability and unwillingness to translate such ideas into a lifestyle. Conflict between values and actions is a theme which recurs throughout the interview, and is something Marie feels uncomfortable with. This appears to be why she is reluctant to talk at length about ecocentric values; she is well aware that her lifestyle does not conform to its tenets (compare this with Jim's enthusiasm for having only one car, turning down the air conditioning and saving water while brushing his teeth, section

6.3.1). However, in this excerpt she makes her sympathies for ecocentrist values clear, although as with other similar statements she spends more time qualifying this with how she cannot live according to such ideas.

Marie: [...] And I'm aware that if I live the way I live and do a job like this, that I have certain expectations from nature that actually means probably it doesn't exist in its natural state, that it's farmed in order to help me, and I'm aware of that, but I'm making that choice if you like. I mean otherwise maybe yes, maybe I should give it all up, live on a mountain in Wales and grow my own food, but I'm not prepared to do that.

PQ: I don't think I could actually.

Marie: Yes I have sympathy with the [ecocentric] ideals, but I also think in practice, we are a long way from being able to live logically from those ideals.

Marie's categorisation as conflictual is based not on the emphasis she gives to ecocentric values; although she did state her sympathy for them, she seemed to be avoiding talking about them. It is based more on her readiness to talk about the conflict between values and behaviour, which was mentioned by her several times during the interview, and is clearly something she has given much thought to. Unlike most other conflictual interviewees she makes no attempt to defend her lifestyle, or industrial agriculture as being compatible with her views; rather she describes the conflict and tries to avoid making statements which would make her sound, to use her own term, hypocritical. Note the contrast here with Henry, who also made a few ecocentric statements, but in his case, they stood apart from what was otherwise a coherent word view.

6.3.3 Case Study: Sally

Sally works for a major food multinational, with UK responsibility for policy on GM food. How this responsibility works is best explained in her own words:

Sally: [...] the [company] policy was developed at an international level so I wouldn't personally have been involved.

PQ: Right.

Sally: I mean, I have had involvement in commenting on it, the different markets, were able to feed comments back, I was involved with that, so yes I suppose I was involved in it.

Her more general role in the company is within PR. The interview took place in Sally's office at the company's UK headquarters.

The interview started with a discussion of the company's policy on GM food because they had been reported in the press as having different policies in different countries depending on the level (or expected level) of consumer resistance. Sally explained that this was not in fact the case.

Talking about what their policy is, Sally made the same point that most interviewees from commercial organisations made, that they respond to consumer demand. However, the following passage clearly shows a belief that the technology will be beneficial, and a decision that it will be used, with only the speed of introduction negotiable.

Sally: [...] as far as the UK is concerned we do follow the [company] policy, and in general that is that [the company] sees that there are benefits in biotechnology but we are very conscious that there are consumer concerns and so we want to do what we can to address those concerns, but I think we are clear about the long term benefits, but obviously we're consumer.... we make consumer goods; we make food....

PQ: Yes.

Sally: And clearly we want to go at the speed that's right for the consumers in our market.

She then goes on to describe her involvement in consumer research undertaken by a trade association, and talks at length about a number of studies of public perception she has read, which contrasts with the lack of knowledge some comparable interviewees showed. She follows this up with a comment which contrasts with statements by other food industry interviewees about the pervasiveness of GM food. Her comment was that there were few products on

the shelves, whereas other interviewees were concerned that GM commodity crops, particularly Soya would shortly be present in most food:

I think Greenpeace have been trying to make this issue take off in this country and I think it certainly is a big issue, but it seems to be a big issue with a minority of people, that's my feeling at present, erm, I think the majority of people still don't know too much about it, I think largely because there aren't that many products on the supermarket shelves. There is the purée that was one, but the next, erm, ingredient about which there was publicity was Soya, which people, its not like chips or beans [laughs] or something that's a commonly available product, so there perhaps hasn't been the interest in it that there might

Much of the interview is very similar to other food industry interviewees, but the following excerpt presents Sally's company as having an overwhelming inertia, which despite her senior position, she seems to feel that she has little influence over:

PQ: Would you be able to say that I can't really argue with the science and the economics of this but I don't really like this, a gut feel if you like, I don't really think this is appropriate, is there an avenue for you to say something like should you want to?

Sally: I mean certainly within the company people are encouraged to make their views known erm and certainly I think I am aware as a PR person that consumers might not wish immediately to embrace this technology; they are going to want more information, so certainly if, or when my opinion is asked then I will make sure that if what little influence I had, was used to ensure that consumers were represented and that their views were taken into account and indeed this is what's happened. I mean other people in other markets would also have passed those views through, so... Yes, I mean, people... there is debate within companies and err it's felt important that the person who is actually co-ordinating this policy will wish to hear those views because particularly from people who are dealing direct with consumers or have contact with the media etc., because they can help them to read what the situation is actually like in people's households etc., so yes there are opportunities to feed in, to give views.

When the discussion turned to values, Sally became much more animated, and seemed keener to engage with the material. When asked about whether she thought biodiversity loss was an important issue, she did not have difficulty with the question as some interviewees did, and was quick to explain why she attached importance to it. The reasons she gives initially are rather vague - an expressed concern about loss of species cannot be categorised as ecocentric or anthropocentric without the reason for concern being articulated.

Sally: I personally do [think that biodiversity is important], because I am interested in environmental matters, so I do think that that is very important.

PQ: Why do you think its important?

Sally: Because we are losing such a lot of species, so that anything that hastens any more species to be lost is something to look at very carefully, but I do think that is a very important issue.

PQ: Are you comforted by scientists that say well we are setting up gene banks so that all of these species that we are about to lose, we store DNA and if we need them in the future we can pull them out again. Is that a comfort to you or are you not impressed?

Sally: Well, it would be nice to have the species on the ground, but at least they are being preserved, but it would be nice if ways were found in which you could have more species out in the agricultural area, it's important for the long term health of the food supply, I think you need to make sure that you have a variety of the species, but certainly the gene banks are a good idea; at least it ensures that a thing isn't lost forever and that it can be re-introduced in other times.

Pressed further about the loss of biodiversity, she makes the comment that there is too much consumption. This statement distances Sally from the technocentric paradigm - she implies here that the solution to environmental problems lies not in technology, but in moving away from the amassing of goods which characterises industrialism.

PQ: But, just to get clear in my own mind, do you think that that would help but you see it as rather more than that?

Sally: What? that the gene banks, sorry

PQ: The gene banks would help if we lose biodiversity but the problems run rather deeper than that.

Sally: Yes, I think so, I mean I think there is a problem from an environmental point of view with just the amount of consumption generally, erm so yeah it's a very important issue.

Questioned directly about environmental values, she is emphatic that she has them, and follows this up with statements that explain the connectedness she feels with nature, and her concern about the extent to which humanity has already damaged nature:

PQ: OK Moving on into even more abstract terrain, would you say on quite an abstract level that you have environmental values?

Sally: What me personally?

PQ: Mmm.

Sally: Yes, oh yes, I do.

PQ: How would you describe them? I know that is a bit of a big question.

Sally: Well I think its consciousness of the natural environment really, and your impact on the species and the plants and animals that are out there, so I would try and protect those if I could.

PQ: Why do you feel that way?

Sally: Well I think everything's interconnected and that err if you do lose species that it contributes to the general degradation of peoples lives and the quality of life and so you look back over hundreds of years and see what's been lost, you would actually see quite a degradation because its happening on such a small scale, people don't notice.

PQ: Do you mean because its happening so slowly.

Sally: Yes, people sort of get used to it and they adjust and they perhaps don't realise that perhaps there hasn't been the degradation in their environment when indeed there has.

Moving on to the notion of intrinsic value, Sally states that she has no interest in why people would decide to preserve nature, so long as they do it. In the following passage however, she makes the point that species should be preserved regardless of their attractiveness to humans, which implies a lack of sympathy for purely anthropocentric motivations:

I wouldn't get hung up about why they want to preserve it, if you've got to be thankful for small mercies, if people are keen on preserving one particular species then that's fair enough what you have got to do is try to persuade them that the more unattractive and unappealing species like snakes are also worth preserving, but at least you have got something to work on, at least if they do care about the planet you have got something that you can work on, so I don't people should sneer or look down on it. They are silly if they do.

Categorising Sally as conflictual is relatively unproblematic. Her professional position is unambiguously anthropocentric, but once conversation turned to more abstract, value based terrain, she expressed ecocentric values with an enthusiasm absent in the rest of the interview. Piecing together a narrative she uses to maintain this conflict from the material collected is more problematic. Although the early part of the interview is characterised by a sense of powerlessness in the face of company policy in favour of GM food, this does not seem to concern Sally. For her the two issues, environmental values and work seem to be unrelated, and so no conflict seems to surface.

6.4 Representatives from the Biotechnology Industry.

Regrettably, only one interviewee falls into this category: Chris, who is also involved in the advisory committee structure. The lack of further respondents in this category is due primarily to their reluctance to speak. Other companies were approached, and although willingness to participate was declared, it proved impossible to actually arrange a meeting. A further problem with this category was the UK focus of the project. Biotechnology companies tend to be international, which can make access to people of sufficient seniority difficult.

6.4.1 Case Study: Chris

Chris is a geneticist who works within the biotechnology industry, and the advisory committee structure. The interview took place in his office.

Chris's style of speech does not lend itself easily to transcriptions. In person, he is highly articulate and speaks fluently. However, he frequently leaves sentences unfinished, either implying the remainder, or jumping abruptly to another sentence. In addition, he sometimes speaks very softly, particularly when he is explaining something which he considers important or sensitive. This means that reading the transcript sometimes makes Chris seem incoherent, which was not in fact the case.

This interview is particularly important, because unlike other interviewees involved in launching GM food, Chris does not have a 'Public Relations' function within his company, nor does he seem particularly concerned with projecting a corporate image during the interview. His replies therefore seem to be more open than for other interviewees.

Chris was deeply involved in the launch of one of Europe's first genetically modified foods, which was a major focus for the interview. He considers the launch highly successful, owing mainly to sales figures, sharing as he does the retailers' view of consumer behaviour that purchase indicates contentment in the product, while dissatisfaction would be reflected in a lack of sales. He dismisses

studies that show the contrary as agenda driven and unscientific, despite his own apparent lack of expertise in the area, and his company's lack of research. While he accepts that he himself has an agenda, he considers that, unlike those who disagree with his work, he does not hide behind spurious science. This statement (and others, see later) contrasts with the presentation of his product, which is marketed as a scientific, economic and consumer imperative; on Chris's own terms, a concealment of his company's agenda.

PQ: Erm, what's your view on how successful that's been, because I know it's sold very well.

Chris: [pause] It's the best measure of success isn't it? It sold incredibly well. I view it in a way as actually confusing the issue. It actually shows it's not... because it's there in garish yellow, in [brand name]'s case, as genetically modified, and people are still buying it, I think actually supports the hypothesis or theory that it's not the words genetically modified people are worried about, I think the message I take from that is.... There are quite a lot of reasons why we did it, because it's something about... not hiding information. I'm sure you will agree that the.... well I don't know... it's about making sure the public has a.... is not being denied access to information. That's sort of really the area. But I think it's a total success. I think it's about the only success we've got in Britain at the moment. It shows that.... I think the way we started that off [inaudible] There wasn't even any argument that we were going to tell consumers. And by pure chance, two or three years before we started the launch, [we knew] we would have to find ways of informing the customer. You say I'm pro, I'm actually cautiously pro, I mean I think it's quite a healthy instinct of man to be cautious about these things.

PQ: Absolutely.

Chris: Erm it's trains and cars. Erm... so I think it's been a total success. It's probably... in the European society.

PQ: I hear that you.... several people have told me that you actually did some research at the time that it was launched about public perceptions, which I don't think you've published have you. What sort of things came out of that?

Chris: We did a little bit of research. I mean our commercial guy did. And I always start off by saying, we started that expecting about 80, 90% to say that they would never eat genetically modified food. But that's a.... it's a meaningless.... it's actually totally devoid of science. Because you're asking questions where people can't make a judgement. And, I don't think it gave us much credence. To that sort of approach.

PQ: That's interesting.

Chris: And again, you might have said, but in my view the only way to be able to do it was to find out. We set a strategy up, and the strategy was entirely about communication. Er... and I think with hindsight you find things were written as though there was a plan. It wasn't really like that, I think we started off when I looked at the resource required, I thought, I think most of us thought naively that it would be at the commercial end. It wasn't. I mean, they just shook hands and that was it. The workload on the communications area was incredible. Strategy was actually to make sure that people know. Not that they understood, that's arrogant. But they were given the information. To me that was the key part of it. And I think the reason for that was because of three people involved, [names two colleagues] and myself, and I do believe that's part of the philosophy. There were many people in the company who said you shouldn't do it, so there was a lot of internal tension as well. Because the words are meaningless. I mean, I totally accept that.

PQ: Yeah, I did a little experiment with the students that I teach. I've got one of the tins, one of the [brand name] tins, and I passed it round, and asked them what it meant to them. The reply was, very little. It was quite interesting that most of them said they'd buy it, but also most of them said that they were actually rather concerned by it, which I thought was interesting. And it sort of clears up in a way the conflicting information that's coming across to me. [name] for example is very bullish about this... customers love it, blah blah blah, and then you look at the.... I don't know if you've seen the Unilever/Lancaster University public perceptions thing, and that's saying completely the opposite.

Chris: About the [product]?

PQ: Not about the [product] specifically, that's much more general.

Chris: But you've got to understand where that comes from. [name] is a socialist, And [name] is a director of Greenpeace.

PQ: And so's [name].

Chris: Is he? I didn't know. But it's coming from a..... But that's what I find irritating about a lot of this area. A lot of people have got their own agendas out. I'm a socialist as well...

PQ: It's very difficult to keep your agenda out of it isn't it.

Chris: Of course, you accept that. But I don't try to hide. I mean I think it's wrong to try and hide their agenda through their science.

Chris later admits to a major motivation for the product, one which was hidden behind scientific claims:

Chris: I think the other thing about this debate, you haven't asked me why we did it. I don't know what [name] said, but a lot of it was done for fun.

PQ: I got that impression with [name]. It was something new. He was like a boy with a toy.

Chris: I enjoyed it.

PQ: I'm not a scientist, but I guess it is quite exciting.

Chris: If you don't enjoy it, there's no point doing it.

However, 'non-scientific' motivations are described by Chris as unacceptable in other people, in a passage which seems explicitly to remove 'good' science from observable reality, and in that sense, vindicate the criticisms of those Chris is dismissing:

Chris: [...] There are some people, and you mention one of the ladies [a prominent critic of GM food] who find it very hard to take things a scientific route. And their defence is that they have a holistic view, and words such as that. They try to actually just do a risk assessment, you can't bring that down to a risk assessment. It's like an argument... the only reason science moves forward is you have to break your thesis. You have to set up a hypothesis, a theory, test it, and you can't...

PQ: Well, that's the idea anyway isn't it!

Chris: Well, yes, right! But one of the great problems is if... one of the great excuses is the holistic overview. And... the good scientist separates that, which is often personal feelings, from their scientific approach. And you have to separate those two things, otherwise you're not doing your job as a scientist. So.... that's a problem of communication. A lot of good people claim the word science, but are not good scientists.

PQ: Because they don't make the split.

Chris: They don't make the split, they don't understand... you know, science is emotion, science is about arguing as well. [...]

But conversely, Chris sets great store by 'gut feelings' and the like:

Chris: [...] I suppose we'd [industry] like to think that we're totally rational. Of course we're not rational. Erm.... you know.... just as in your university, emotions are at play. Lots and lots of different emotions.

PQ: Right, OK. [...]

Chris: Just as an [example], the Ciba maize and the ampicillin, we saw that years ago, no, longer than that, we decided not to go ahead down that route not for safety reasons, because there isn't a risk if you do a risk assessment, it's just simply that culturally we recognised there would be a problem. And events proved us right. So again, you.... I'm a great believer in listening to these gut feelings. And then you can make a judgement on that first, and I do it myself.

The contradiction here is more complex than Chris simply allowing himself to act unscientifically, while criticising others for doing the same. He implies a distinction between science, in which only his definition of scientific method is acceptable, and the context of science in which other methods are appropriate, for example his company's judgement on the political unacceptability of ampicillin resistant maize. However, his holist critics who he dismisses as unscientific are, on Chris's terms acting in the realm of the context of science, rather than the science itself, whereas on their own terms are levelling criticisms of being unscientific at Chris's work, with its profit/fun motives.

The following passage is quite revealing in this context. Here Chris makes the assumption that an organism is wholly defined by its DNA, and that unexpected side effects can be tested for by answering a series of questions. He does not consider the possibility of questions the scientists does not think to ask, nor of the problems of reductionist methodology considered in chapter two.

PQ: What they've said to me on this point... I think not specifically about rape, is that the intermingling has always been amongst rapes, and once you bring something completely foreign in, that changes it.

Chris: Why?

PQ: I don't know, I'm not a geneticist. But I'm sure you've heard the arguments, that it's something that couldn't have been there had we not genetically manipulated the rape.

Chris: That in itself is true, and [rape was created] in 1930 having crossed oats and wheat. But that in itself doesn't tell you anything. It doesn't mean there's increased risk. It just means there's another gene there. Out of 50,000 genes, you then have to break it down in a scientific approach and say hold on, so I've got a gene in that place and... I don't know what it does, so how does that affect pollen transfer rate? How is that affecting the flower morphology, has it affected the amount of pollen produced? I mean that's the only way that you can [find the answer]. So no simple holistic things are actually.... it's not even

science. It's like saying there's a correlation between camels and the number of people dying of cancer in London. It's meaningless. But people like that are.... but that isn't risk assessment.

Chris then goes on to be even more dismissive of holists' arguments.

Early on during the interview, in response to an explanation from me about the subject of my research, Chris explains his longer term motivations for developing GM foods, which revolve around moving away from reliance on environmentally destructive chemical technology. His final comments about the possible technical limitations of the science, and the enthusiasm of the 'money men' lend credence to the genuineness of his sentiments in this passage:

Chris: [...] But I believe.... you know, you asked what I believe in, my personal belief is very much that we have to... this technology is too critical to lose. Critical..... in.... It's critical for what my job is, which is offering farmers choice and great food. And it is not either or. It is hyped too much. A lot of it's going to be about giving the farmer choice. Choice in disease control, choice in... just.... my analogy which I have said a couple of times is... 80, 90 years ago it was the scientific.... German chemists who started work with dyestuffs, and from those dyestuffs came antibiotics, plastics, a whole.... chemistry is high temperature, fossil fuels, organic solvents, quite polluting. Anyway what we are seeing here, my grandchildren will see, my great grandchildren will see, is going to be biological systems, sustainable.... it's going to be about low temperature, ambient temperature, water based, so this is what it's really about. We're just at the start.

PQ: Right, yes, I understand what you're saying.

Chris: So there's no great breakthrough, no quantum leap. Things will just keep slowly building up. That's why I'm motivated.

PQ: Does that mean you subscribe to the sorts of things, well, Monsanto has been saying, a lot of other people have been saying as well, that within ten years everything's going to be genetically modified?

Chris: No I don't.

PQ: You've spoken a lot about choice, but of course however much things are labelled, if everything's been genetically modified, the label becomes pointless if you can't buy anything else.

Chris: Well that's right. Well I don't. You want things to go fast naturally, but agriculture is slow by definition. [...] And the easy things have been done. The tomato was easy, Round-up Ready resistance was easy, Bt was easy...

PQ: Nitrogen fixing, things like that are incredibly difficult.

Chris: Oh, incredibly difficult. It may be impossible, you never know. Disease control, insect control, other than that it's difficult. And I don't think a lot of farmers will want to grow it. And so no, I'm not a great believer in 10 year changes. That's the money men talking.

Later in the interview, he uses more usual arguments, about which he seems to be much less informed; here he explicitly mentions the 'company line', in contrast to other arguments he puts forward which seem to be more personal. Of particular note here is his notion of quality; subsequent to the interview, as GM food

became increasingly of public concern, organic food became synonymous with quality.

PQ: Something that you said a few minutes ago, well, at the beginning of the interview, that this whole scientific area is absolutely essential. One of the reasons that you gave for that was the possible wider uses for it. [...] does that comment of yours apply if we just look at food?

Chris: Yes.

PQ: Why is that?

Chris: Er... at several levels. Again, I'm not UK biased. What my company says around the world. It is increasingly difficult to see how one can keep increasing food supply. To me, population has stayed ahead since the war by about one or two per cent. So, that's one reason.

PQ: Yes.

Chris: Secondly, as people get richer, they want quality of food. Quite rightly. [Later in the interview, Chris expands on this by talking about increasing affluence in China leading to increasing meat consumption] There are more problems there. Er... I think those are the two main reasons, I have [inaudible] in linking food to health, [...] the population here wants fresh food all the year round. They now expect to have lettuce, erm... all the year round in Sainsburys or Safeways. When I was growing up, we used to have the winter veg, and that was it.

He is, however, quick to acknowledge the political dimension of hunger, albeit in a rather ungrounded way:

Chris: We are not the solution to these hunger problems, starvation problems. We are just part of that solution. You've never seen me actually claim...

PQ: No, no. I haven't.

Chris: But I always say part, because it is politics, murdering each other, build roads would help an awful lot, and storage of food.

When discussing alternatives to genetic modification, Chris is dismissive.

We're getting towards a situation, with the climate, and the land we've got available, if we had not got inputs into the system, we would not be able to feed half the population. Or we would feed them at a lower level. Even during the war everything was turned over to farming, [inaudible], I mean, people forget how crowded this island is. So I mean I just don't accept those areas. I'm quite happy for them to do research, and there's an awful lot of research going on in the organic area, I suspect the problem is that the people who support it don't want to hear that. There's nothing.... we have nothing to fear as a company, we have no policy against organic farming. It's silly to think we are.

He attaches considerable importance to food security, using examples from war and post-war rationing in Europe to argue that the public will embrace technology which increases food production.

Moving on to values based arguments, Chris is quick to declare the importance he attaches to biodiversity:

PQ: [...] What I'm interested in is whether you think that that argument [whether GM food will increase or decrease biodiversity] is actually important.

Chris: Yes.

PQ: Why do you say yes?

Chris: Because I think biodiversity is important. Erm, sorry, I mean it's important to me personally, and it's important to society. It's important to biotechnology, because of the genes, so actually biodiversity is very important.

Probed for ecocentrist sympathies, Chris re-iterates his earlier comments:

PQ:: [...] All of these things that you've said boil down to.... basically, well it's useful for humanity. Do you think it goes beyond that?

Chris: I think that's the highest level of motive. I don't want to be awkward, but I can't see what's wrong with that answer. It seems to me a good answer.

However, a later statement reveals unambiguously that Chris is quite comfortable with notions of the intrinsic value of nature. His earlier statements appear to be more a result of a misunderstanding of my question, and perhaps that the topic was unexpected:

PQ: But you don't think it goes beyond that to these things having value in themselves, even if they're of no use to us.

Chris: Yes, of course I do, I believe that very passionately.

PQ: Mmm.

Chris: Yes, of course.

This statement is not the only one of environmentalist sympathies. In the following excerpt, he echoes an argument put forward by Eric about the Green movement:

Chris: [...] I could quite happily join Greenpeace actually.

PQ: Really?

Chris: I used to be a member of Greenpeace.

PQ: But not any more?

Chris: No. I think they've lost all their credibility. That's a personal view. When I joined them.... I think it's happened... I suspect in the 60s and 70s, industry was pretty awful on pollution. And because of the actions of Greenpeace, and others, awareness has built up....

PQ: They've put the environmental agenda on the map, very successfully.

Chris: And I think what's happened is people are still trying to fight wars... the Greens are trying to fight wars which have already been won, erm, ten years ago.

It is arguable that now the environmental movement he once supported has turned against his own profession, a sensible form of mental self-defence is to dismiss

the movement as irrelevant. Support for this hypothesis comes from a passage, reproduced more fully below in which he expresses doubt in his moral integrity:

I've never had to compromise my principles... perhaps I've... or I don't know, perhaps I'm an apologist.

This dismissal of the environmental movement does not include assigning to them the same values that drive the corporate sector, as various other interviewees did:

The other point I think that they're doing wrong[the biotech industry], is that they give feelings, and motives to people in Green organisations which are their own motives, so it's about money and it's about power, again.... they're not motivated by those factors. Especially not commercial factors. it is a quite fascinating problem.

Chris's motivations for following the career path he has are not value driven in the way that several other biologists interviewed were. He was happy to talk about his career, and articulated a story based around his abilities, opportunities which presented themselves, and chance. However, at times during the interview, he mentions work related values, which seems to be something that interests him. Aside from the passage reproduced earlier where he talks about biotechnology as an environmentally superior successor to chemistry:

PQ: Is it conceivable that you'd stand up at a [company] meeting and say well the science is fine, the economics is fine, but I just don't think we should be doing this. I don't like it.

Chris: Yes.

PQ: People say that?

Chris: Yes. I say it.

In the following passage, (see also comments above) he is very interested in the idea of corporate inertia, after a struggle on my part to convey the concept to him. During the interview, I got the impression that he wasn't entirely happy with his and his company's work, and found the concept attractive as a way of absolving the individual of responsibility:

PQ: [...] imagine that they [an environmentalist] got a job there [at a biotech company], they would immediately be confronted by something which conflicts with what they believe in, so either they compromise their principles...

Chris: Why?

PQ: Because if they don't do what they're told to do, presumably they'll get the sack.

Chris: That's a different argument again, but as I say, I've never been in that situation, I've never had to compromise my principles... perhaps I've... or I don't know, perhaps I'm an apologist.

PQ: But also, perhaps you were selected to work for [your employer] because the way you think fits in with the company; people that don't fit in would be screened out, and so you develop this inertia in that way....

Chris: I think that's actually a very good point, we do tend... that's another thing we should be thinking about, because... recruitment.... you do tend to recruit people you like.

PQ: Mmm! Of course you do.

Chris: One of the things you've got to do is throw a bomb in the system occasionally to actually get people.... that's why I get those skilled... try to get the science skill base up. Who actually recruits them. It's the guys who are doing the.... routine's such a [?] term.... who are doing the present work...

PQ: Yes.

Chris: And they are going to feel very threatened by these people who come in with [new ideas]. So, yes, you have to have a sort of... I don't know the answer, [inaudible], but you know, it's got to happen.

During a lengthy, and wide ranging interview, in which Chris made many predictable technocentric and anthropocentric statements, the wider context of his work seemed to be the site of some conflict. The issues were obviously something of great interest to him, and his speech seemed to be more than simply a conveyance of pre-formed ideas, but part of a process of exploration. Chris is notoriously busy, and it is not difficult to imagine his hectic working life allowing little time for reflection. Furthermore, his willingness to devote so much time to the interview indicates a real interest in the material. It is difficult to imagine someone with a more anthropocentric working life than Chris, but the interview gives a clear picture of ecocentric values. The conflict this creates seems to be bubbling just below the surface, held at bay sometimes by a few apparently ungrounded arguments, but more often by a compartmentalising of values and work. As the context of Chris's work becomes more widely discussed in the media, it would be interesting to see whether he is able to maintain this conflict, and how he does it.

6.5 Representatives from NGOs

It might be assumed that all NGO respondents would fall into the ecocentrist category. However, the NGO community encompasses more than just environmentalists - here Janice represents a consumers' NGO, and is also a member of an advisory committee. Sue works for an environmental NGO, but does not oppose GM food. She is also a member of an advisory committee.

6.5.1 Case Study: Janice

Janice works within the consumer movement, and is currently serving on a Government advisory committee whose remit includes genetically modified foods. She is not a scientist by background. The interview took place in her home.

Working on an advisory committee has given Janice a deep understanding of many of the issues, particularly labelling which surround genetically modified food. She is particularly aware of the limitations of the regulatory structure of which she is part, which she finds frustrating, but at the same time, she derives satisfaction from her efforts to overcome these limitations:

You could argue that MAFF officials are much... er... better practised in the art of administering the advisory committee structure, because it's got a much more extensive one, we've had much longer... history of using them, erm... but as a result the administrative processes constrain what you can do very substantially, so that... erm.. in the main the agendas are determined by the secretariat. Secretariat staff have determined their own line internally before the papers ever come to you, and so what you get is a well worked paper with a series of logical points, that lead to er.. a conclusion and a recommendation, which always used to be a simple recommendation, and nowadays is usually a choice between two or three very narrowly defined options. And although it's not beyond the wit of man to say well we don't like any of those, and we want to send this back for complete re-working, and rethinking, the occasions when that happens are very few and far between.

Now you might well get an answer from MAFF officials in those days, erm, which would have said er.. that [vested interests within advisory committees] doesn't come into it, because we have to respond to legitimate requests from industry to evaluate their products, or their proposed products, and that it doesn't matter how undesirable in principle a proposal is, erm, if we're asked to evaluate it on safety grounds, we'll evaluate the safety. And I think what's

happened is there has been a shift, and there's been a recognition that the safety analysis was not enough. A part of that I think has come through the influence of the FAC. Erm... the FAC has also consistently said... because there have been... there've been tensions around the remit, and... and it's not adequately resolved now, erm, and again I think that's an area that would want to be looked at in any revision of the mandates for the advisory committees. That one of the things the FAC... the likes of me have been saying, is that the FAC has a responsibility for surveillance of... the safety erm.... authenticity... er... and er... contamination of the food supply as a whole.

Janice has a difficult role in what has traditionally been a committee structure dominated by scientists, particularly those with industrial interests, most of whom are men (although she does not mention the gender issue herself). While her own committee is dominated less by industry scientists than most, cross-committee issues means Janice is far from insulated from these problems.

In contrast to the retailers, Janice expresses a complex view of consumer preferences. She expresses difficulties she feels preclude reliance on purchasing decisions as a guide to consumer preferences, and has been involved with redefining what is perceived by the committee as 'need': in the past colouring was considered a 'need' because it was required by manufacturers to colour food. Current thinking does not recognise a need to colour food, and so cannot define most food colourings as needed.

She has been involved in the debate surrounding labelling of genetically modified food, which she sees, together with provision of non-genetically modified alternatives as being essential for consumer choice. She views a possible solution to the current labelling regime (which she considers unsatisfactory) as coming from a greater involvement from consumer reps, as proxies for the general public in the process of bringing genetically modified food to the consumer, and considers that this might lead to considerable operational constraints in food-related area, with greater freedoms in clinical areas due to perceived choice, containment, and consumer benefit.

Janice had little difficulty talking about her views on the intrinsic value of nature, and did not consider such views to be bizarre or unusual. However, such ideas clearly did not figure within the consumer movement, not because of a perceived lack of consumer interest, but due to a lack of resources to cover all relevant

issues coupled to a belief that such issues were being addressed already by other, better resourced groups:

[there are] many, many more environmental organisations, if you look at them on a world scale, you know, there is nothing in the consumer movement like Greenpeace, you know. So just entirely different. So, again, for fairly pragmatic reasons consumer groups said er “We’ve got very limited resources, lets focus on the area that we are.....[competent to deal with]

Thus for Janice, while her ecocentrist sympathies were not reflected in her professional activities, this did not appear to create a conflict for her. Certainly, her own anthropocentric arguments do not contradict an ecocentrist position, as other anthropocentric responses in the study have done, although her faith in the putting forward of ecocentric ideas by environmental groups is perhaps open to question.

6.5.2 Case Study: Sue

Sue works within the advisory committee structure, and also for an environmental NGO. The interpretation of Sue’s interview was less straightforward than most, as she does not articulate the ecocentric views the theoretical parts of this thesis would have predicted. Particularly unexpected was her explicit rejection of ecocentric ideas, which on further probing turned out to be based on a misunderstanding of ecocentrism. This misunderstanding was underlined by an unprompted, unambiguously ecocentric value statement at the end of the interview. However, such misunderstandings do not imply that Sue has never thought about these issues. Her fluent responses, and her criticisms of various choices of words I made during the interview showed clearly that these were issues with which she was familiar.

Sue did not embark on a career within the environmental movement as a result of strongly held personal values (in contrast to John for example). Instead, it seemed to come about more as a result of jobs she was not suited to, personal empathy with colleagues, and less firmly rooted concerns about damage to the environment:

PQ: [...] why do you do the job that you do.

Sue: On [the advisory committee]?

PQ: Generally your career in a wider sense.

Sue: Oh, right. Probably by default because I did a lot of temping jobs when I was at university for commercial organisations, and I think I just decided I didn't want to work for commercial organisations. I mean I ended up in the Green movement slightly by accident in that I suppose I discovered I wasn't temperamentally suited to working for solicitors or lawyers or whatever, [...] I wanted to be a journalist, and I decided after having a lot of involvement in student journalism that I wasn't temperamentally suited to that either, [...]. And when I was looking around for jobs I saw a job doing a conference on food issues, [...] and I think that I realised that here was a sort, I mean I really didn't know much about the voluntary sector, here was a whole group of people who I rather got on with, and identified with, and things that I was interested in, and thought were important and then I joined the [environmental NGO], and that seemed to be it. I didn't go through school and university with a burning desire to be an environmentalist. I don't think you did that, I mean this is... I mean you're talking about late 70s, and the idea of it as a profession wasn't at all developed [...]. I slightly fell into it but I suppose I for whatever reasons identified with it I identified with the voluntary sector, and the sort of non-profit motive I suppose, and identified with Green issues. Which I can only put down to gardening or something. My father introduced me to gardening. Umm... yeah, I just sort of liked where I was. I didn't articulate anything with deeply held principles at the time.

PQ: Is there anything that drove you at all, even on a slightly less conscious [level]....

Sue: Oh I am sure it must do, and I am sure I have my own values which is to do with that we waste too much and use too much, and abuse the environment too much, and it all should be better, yeah there is a basic set of values under there, I hope that is about it would be nice to make the world a better place for everyone and not to use up all its resources and foul up its nice bits. Yeah that is a hope fairly deeply felt, I wouldn't be working for the salary I was for so many years without that being the case I don't think.

Sue's unrooted environmental concern is reflected in her expressed position on Genetically Modified food, which she presents to her advisory committee. She has no fundamental objection to the genetic modification of food, but is concerned by the way in which the technology is applied:

[...] I sympathise with somebody who says, well hang on lets step back a bit, lets go several steps back, I personally don't feel uncomfortable with the idea of tinkering with genes so that you know what my individual feeling is, I do feel concerned about the direction as in terms of agricultural and environmental strategies, and I do feel concerned about ecological impact of GMOs [...]

This (for an environmentalist) moderate stance means that her input to her advisory committee is to question to what extent the precautionary principle is applied. She is more inclined than her colleagues to advise against giving consent to a new variety on the basis of uncertainty:

[...] the majority view which sometimes goes along with what I am saying and sometimes not, I can give you a couple of examples where they don't, I think by and large agree and I have [been] explicitly outvoted there's things like my voting against the commercialisation of the first oil seed rape release on the grounds that there are uncertainties about, with which is could it hybridise with wild relatives, and I chose to see commercialisation at that stage of knowledge as a step too far and therefore voted against it. Now most of the rest of them feel.... well its not that they know any more than I do, its just that their scientific discipline makes them choose to be comfortable with the areas of uncertainty that are left, in other words it's all a matter of imaginative leap, [...]

She feels that this stance is what has made her an acceptable member of the committee. The existence of the committee means the decision has already been taken to use the technology, so it would be pointless appointing someone who was opposed to it in principle. However, Sue does not mention the possibility that such a person would be able to move the committee's output to a more precautionary one.

PQ: Do you think that because you think about things in that way, and having read through the stuff from the [Sue's environmental NGO] it's clearly how the organisation works do you think that's why you are on [the Advisory Committee], in that you are seen as somebody from the environmental movement who thinks about things in a way that's closer to the way that they think about things, and that they didn't take on [John]?

Sue: Yes, well there would be no point in taking onto a technical committee someone who had fundamental objections to biotechnology, because all they could do is sit there and say no. I mean it wouldn't help, it's not the job of the committee to mediate public views in society, and be some sort of democratic reflection of whether the stuff should work, the committee has a very specific remit to judge safety, so what you argue with is the remit, and the role of other bits of the system to have the debate and make the judgements, but you can't sit in there and make those arguments. Because as I say it would just frustrate everybody, you are doing the wrong job basically,

Sue also gives a valuable insight into both her role on her advisory committee and her view of her scientist colleagues, who she sees as politically naive, and thus in need of her guidance:

they are not by and large very political people in the sense they understand how regulatory systems function and the interface between the scientific and the official and political. Particularly, they are often naive about the interface between the official input, the people who sit with them, they are not quite sure where they are coming from or if they are coming from anywhere in particular, or how they answer to their political masters and all that kind of thing, whereas I am much more conscious, and am on the look out for anything that I think is official... erm... freelancing if you like, or actually there is something coming down from a particular level, which they are not quite saying, but there is something reflected in the way the secretariat handles things. So on that level I think they sometimes... you know... look to me for that kind of intelligence as it were on a broad level, so as I say it differs it depends on what you are on, they probably... yeah... don't think I'm a brilliant.... well they shouldn't, think I am a

brilliant scientist, but I suspect they might agree the things they ought to look out for if the committee is going to be credible, and things like the handling of the political... the political and official handling of herbicides has turned out to be one of those things.

Sue elaborates on this point when we discuss the use of biotechnology in solving food security problems in poor countries. By this stage of the interview, it is clear that Sue's understanding of the causes of hunger is based less on technical considerations, but on contextual factors. Because of this, I considered it most unlikely that she would use this argument as a justification for biotechnology. I therefore pointed out to her that this was an argument frequently used by her colleagues, on the (correct) assumption that she would disagree with it. Her reply gives invaluable insights into other interviewees and their institutions, which are specifically mentioned. More importantly, she claims to have argued about this point on many occasions with Chris, who nevertheless seems to attach considerable importance to it:

PQ: One of the ideas they [Sue's colleagues, and many industry interviewees] always put across, or almost always, often quite emotionally, almost, they really get quite agitated about it, is that all these wider issues [risk and environment] are all very well, but we must have this technology to feed the starving millions of the third world.

Sue: Yeah... interesting...

PQ: And of course the third world activists get really really upset about that for obvious reasons. I am struggling to get a handle on that really because... I can't believe really that they accept that so unquestioningly, are they saying that to justify what they want to do anyway?

Sue: I think they probably do, it's like anyone as an individual you tend to rationalise what you are doing as having some usefulness and I suppose that is the ultimate usefulness and plant breeders... yeah, I think they would all like to think they are contributing to something... important, and remember they are often quite removed from agro-industry in its very sort of commercial sense, if you spend your life sort of concentrated on... you know... identifying which genes will do certain things and then your mind expands the broader possibilities of them, you are not necessarily switched in to actually how that will be used in practice or whether it will be viable.

PQ: Take [Chris] for example he must be fairly clued into it.

Sue: Yes well he works for the company, he would be, I'm talking more about the people who are the actual... who do the manipulation of genes, and by and large are attached to scientific institutions, who... some more than others, I mean [Alan's employer] is very plugged in to the agro-industry side, for instance, but some less so, and [?] and people like that. I think it varies but I can sort of see how they would, well [Chris] will obviously tell you it will feed the world because that's his business, I have this out with [Chris] constantly, saying that if you are going to say that, can you please actually demonstrate which crops you are talking about, and what sort of transformations, and how it all works, and they have no notions of the politics of food.. I think in general, that most of hunger is about distribution and access, I think most people don't, the politics of food is quite an obscure saying and most... you know, all of us in our day to day buying from supermarkets don't really understand where things

come from and why they priced as they are, how that all works, so I.. I.. wouldn't like to say they are being cynical about it, I think they want to probably believe that, but they probably haven't made, they don't know enough about the politics of food to make the next steps to argue how it would really work. You know, they would like to really think that a technological advance translates straight into a benefit, and we... you know... I find it hard given the green revolution, if we hadn't had the green revolution experience I could understand it better that they feel like that, but the fact of the green revolution and the things that went wrong with that, I would have liked to think [that it would] be more in plant breeders' minds but I don't seem to see that it is.

PQ: No I have seen virtually no evidence of that at all.

Sue: No... no, well I think its very interesting, and I suspect, well to be honest the UK scene is very parochial, you know, the UK plant breeders, erm.. unless they are... some of them are attached to big international companies, but they just seem very... you know, what they know about it is quite limited really, the number of crops they know about and the context of those crops, always seems to me sort of astonishingly limited really. On.... you know, I mean really, on [Sue's advisory committee], basically what we see is rape, and there has been a wheat coming through and beet... sugar beet, erm, potatoes but they are all... you know, very European crops. I mean soy... well soy only in the importation sense because it's not grown in Europe to any extent, maize now a little bit, but their focus is very European if not UK.

Earlier in the interview, we discuss Organic agriculture as an alternative to industrial agriculture, and although Sue has clearly devoted a good deal of attention to ways in which agriculture can be made less environmentally damaging, her knowledge of Organic agriculture seems to be comparatively limited. Her stance, and that of her NGO certainly owes more to the politics and compromise with which the interview is peppered than the values-driven argument one might expect from an environmentalist. She considers that genetic modification hasn't been examined in sufficient detail to decide whether it should be permitted in organic food, but that argument presumes a technical evaluation of the process, with a conclusion about its positive or negative effects on the environment. This framing of genetic modification in organic agriculture precludes a rejection of genetic on the basis of values as suggested by Naess's methodology and John's arguments.

PQ: One of the other things that I am struggling to get a feel for is how this is obscuring other possible avenues for agriculture, which is something you mention in your [Sue's NGO] stuff isn't it. I spoke to [someone from the Organic sector] and he came out with all sorts of very impressive figures about how we could move much more towards organic agriculture, but everybody I have spoken to on the other side of the fence, [...] has got equally impressive barrages of figures to tell me why organic agriculture is for peculiar middle class people with hang ups. [Sue laughs]. [...] Umm, what's your take on all of that.

Sue: Well I am not really an expert on that side, but what [Sue's NGO] is concerned about is something called sustainable agriculture which neither we nor anybody else has really pinned down I suppose.

PQ: It's unpindownable I suppose.

Sue: Well, all right, more sustainable agriculture. Which basically means trying to remove the damaging elements of agriculture as it is done today. As I say, part of the enterprise is to pin that down and try to understand what contribution biotechnology might make to it, in other words we haven't ruled out the possibility that some applications of technology might fit with things you want... to change about current agricultural practice. We don't aspire as organic.... as an organisation, I mean we haven't taken a position on it, and I wouldn't take a position personally as to whether it should be a greater or lesser part of the picture, but we are not an organic agricultural organisation, and I'd need to know more about that, the extent to which organic could be expanded, erm, viably.... erm.... well... what potential it could have if it was more supported for instance, but I mean that is not at all clear to me, so I shouldn't pronounce on that itself, so organic as [John] would mean it I shouldn't pronounce on that. As I say what we are after is to understand how agriculture could be better in general, and obviously eventually that means coming to some definitions about what that means. Ummm I think what's.... difficult about it is that is so bound up with how.... politically how agricultural subsidies are organised, umm and I think throwing around figures, you would have to understand it in the context of how agriculture is subsidised, in other words if politically we chose to have organic agriculture, I expect it could be done, but it may mean that some things were imported from outside [...] [but] as I say I am not enough of an agricultural [expert] to know about all that.

PQ: Perhaps we could eat a little less meat and we could manage with less space.

Sue: Well exactly that's entirely political, do you price meat out of peoples' diets which would not be a bad thing to do in health and agricultural terms at all...

PQ: McDonalds would be delighted!

Sue: Well, exactly. Its a highly politicised thing to do to take that sort of decision on peoples behalf, that you tinker with the market on food stuffs in that way, so I don't know, I can't really comment I suppose that much about the viability of organic, and therefore the extent to which biotech might conflict with that, I mean it also depends of course on what attitude the organic movement take to biotechnology, at the moment they are rejecting it, I mean I am not absolutely sure that that is the right thing in the long term. But again I haven't debated it with [John] or others enough to really come to a view.

PQ: He is really adamant.

Sue: Well I know he is, and that's fine, he is entitled to that view, all I am saying is I haven't, I don't feel we have examined the issues enough to absolutely come to... to that view that biotechnology is incompatible with a better type of agriculture whether you label it organic or what. They want to keep the organic label as free of that I can perfectly well understand it, but it may be cutting off possibilities, that actually do not have environmental.... other sorts of environmental consequences and might be able to use... lessen the number of inputs in agriculture.

Probed specifically about ecocentrism, Sue begins by rejecting the notion, but this rejection, on further probing turns out to be based on a misunderstanding of ecocentrism, and a confusion between what Dobson terms strong and weak

anthropocentrism.³ To recap, weak anthropocentrism is an inevitable part of the human condition; that we cannot avoid considering issues from a human perspective, whereas strong anthropocentrism is the valuing of nature only in terms of its human utility. Sue rejects ecocentrism using a weak anthropocentrist argument, which does not stand further probing. Shortly afterwards, she rejects strong anthropocentrism, making the point that this rejection is what has driven much of the environmental movement, and makes an unambiguous ecocentric statement (in italics). Finally, using the pragmatism she returns to throughout the interview, she rejects ecocentrism as a practical way of living, but again by misunderstanding it. Her statement about nature having dominion over humanity ignores the ecocentric insight that humanity is a part of nature, and thus inseparable from it. Furthermore her example of ecocentrists being unable to cut down trees would also mean that they would be unable to eat, which as Chapter Three explores in more depth, is not the case.

PQ: Most of the things you have talked about, your concern for the environment have been quite human centred, about wasting resources, better environment for future generations, and all of these sorts of ideas which I guess most people share, but do you have sympathy with people who say that it goes actually beyond that, and there is a lot of things in the environment have a kind of right to exist a sort of intrinsic value regardless of whether we find a use for them.

Sue: No I don't because I think that's anthropocentric. I think our valuing of those things is based on our psyche and their value doesn't exist without us articulating it like that.

PQ: Perhaps value is the wrong word, perhaps right.

Sue: You don't have rights without responsibilities, inanimate things don't really have rights to be honest, because if you took that to its logical extension, you wouldn't build anything anywhere you know if every tree had its own right to exist, because it happens to have seeded itself there you couldn't ever destroy it, do you see what I mean. Its much too absolutist to say each living thing has a right in itself.

PQ: I do understand what you are saying, but I don't know that I would agree with it.

Sue: You are meant to be an impartial researcher you are not meant to put your own values on peoples pronouncements! [laughs]

PQ: I would say that that's not possible, and I gave up trying to be impartial a long time ago.

Sue: Yeah!

PQ: Also you have told me what you think so I can go ahead and interrupt you now. [both laugh] I think you can feel that things in the environment have a right, isn't a good word, but I think things in the environment have a right to exist but it doesn't mean you can't cut down a tree, it means that if you cut down a tree you will really regret it, and you will try and keep it to a minimum.

Sue: I think that's the practical way that most people go at it but that is a completely human construct this is a shame we shouldn't do it any more than

³ See Chapter Two

we need to, and then you have got some concept of need, where do you draw the limits on need, all that is a human construct it's a human rationality. All you are saying is you go into a debate on a human level about human needs as they interact with the environment, but all that has endless scope, you could say that I need to build my straw shack here or I won't live, as opposed to I need to build a skyscraper. Once you get into that sort of debate about what we need to do you have got endless human value judgements on what's a need. Of course it's a perfectly good principle to say minimise, but yeah we have had endless wonderful regulatory debates about what minimised damage to the environment actually means, and what it is tempered by and what counts as something that's valid to do, and all that is intensely humanist, it's about human values and conflicting goals, and aspirations and so on and so in that sense I found it hard to say that there is anything that exists very strongly outside that, and you can assume that there is that these things ought to have an absolute right to exist, and we are continually encroaching on it but it doesn't seem to be a very helpful concept to people interactions with nature, it's like original sin you can't get away from the fact that we are a blight on the face of the planet, you could put it like that if you want to. But otherwise in terms of something is operationally useful about our relationships with nature it doesn't seem to me to help very much. You have got to get a societal consensus about what you value and why, and what can and cannot be sacrificed for what reasons, and I suppose that is what the Green movement has really wanted, and there has usually been an absence of that debate and people just trample over it willy nilly and that's what most of the Green movement has reacted against is *the idea that we have dominion over nature and it's all for our benefit and we will do what we like with it. That is wrong... in itself*, but to go completely the other way and say that nature should have complete dominion over us isn't necessarily right or wrong it's just very impractical.

It is impossible to categorise Sue's professional activities as ecocentrist, given her statements about the desirability of genetically modified food. It would be tempting then to categorise her as a coherent anthropocentrist, given her rejection of ecocentrism, but given that this rejection was based on a series of misunderstandings, that she made a strongly ecocentric statement, and that the anthropocentric concerns she articulated during the interview are not necessarily incompatible with ecocentrism, she can be categorised as conflictual.

6.5.3 Other NGO Representatives.

No vignette for Charlotte has been reproduced here owing to the similarity of the material to Janice's interview. Like Janice, Charlotte works within the consumer movement and the advisory committee structure.

6.6 Civil Servants

This category has only one occupant. Regrettably I was not able to secure any co-operation from the Ministry of Agriculture, Fisheries and Food, who are the most important actor in this sector. The interviewee here works for another government department.

6.6.1 Case Study: Graham

Graham is a scientist, and works for a government department with responsibility for policy on genetically modified food. The interview took place in his office

The early part of the interview is dominated by the credibility Graham feels different participants in the debate have, which is reflected in the level of knowledge he has about the claims of different groups. In the following excerpt, he demonstrates an intimate knowledge of an early GM food:

Graham: And the way that that was handled seems to most people as a model for how best to introduce new technologies, and so I think the way they did it, was that they started, in parallel with the development of the actual techniques, they started sowing the seeds in the minds of the public, and in the minds of retailers that there was this technology coming along, and this is what it could do, er, they were actually on a sticky wicket because erm, the benefits of that particular paste are not particularly obvious, there are benefits, there are environmental benefits, in terms of using less energy and less water in processing the stuff.

PQ: Mmm.

Graham: It does produce slightly better paste, but it's not an enormous amount cheaper than the old stuff, but I mean, otherwise, why bother.

PQ: I haven't tried it. It's too useful a teaching aid to ever eat!

Graham: I can tell you why it's in tins rather than tubes if you're interested.

PQ: No, I don't know that, [...]

Graham: It's because they can't afford to make tubes in this country. The only place to make tubes is America.

PQ: I had no idea.

Graham: The special metal tubes are all made in America, and it's too expensive to ship the tomatoes over, so they can't put it in tubes, so they put it in cans. That's the only reason.

But appears unaware of criticism of a major new GM commodity crop he seems otherwise familiar with:

Graham: And you gave the example of BSE. I get the feeling that GM is not going to be as contentious as that issue, because they're not as dangerous. It's clear that they're not as dangerous. Erm, there are some particularly sticky ones at the moment, the maize which has got an antibiotic resistance marker, which is an unfortunate one, in the sense that... it's a good product, it makes it much easier to grow the thing without spraying pesticides all the time.

PQ: yes.

Graham: So there's environmental benefits.

PQ: Yes, but there are questions even with those they're not.... We're talking about the Bt maize?

Graham: Yes.

PQ: There's the problem of the Bt generating resistance in the Corn Borer...

Graham: Oh yes.

PQ: And it undermining the use of Bt for organic farmers, which... I was talking to someone from the Soil Association, and apparently it's just about the only pesticide they can use, so it's kind of serious for them.

Graham: Yes. I mean that may well be the case.

He seems to be aware that his and his department's science based approach is unsatisfactory, and that other considerations need to be taken into account:

Graham: [Long pause] I think the views of the foresight panel that I've been involved with, is coming round to the idea that yes, there are these difficult issues to resolve between environmentalists and scientists.

PQ: Yes.

Graham: But what we can't do is to kid, and hope it'll go away, because it won't. Probably, the point you were making, is that you may store up problems for the future if you don't. We should talk to these people right up front. I mean the very limited amount of dialogue that has gone on in the background has borne that out.

but this seems to be a concept which he has difficulty in assimilating. Despite the above comment, and other similar ones with which the interview is peppered, he consistently frames the debate only in terms of science, of which he has a positive interpretation. In the following excerpt, he is struggling with the need to take on board other views and the irreconcilability of his own views with that of his opponents. Here he is simultaneously excluding some groups, while stating that all viewpoints must be accommodated:

Graham: Erm, but as I say, these consumer issues have come to the fore, and so obviously we need to involve those people. I mean, we've identified, you know, a few good organisations that are producing reasonably balanced viewpoints.

PQ: How do you define good, and how do you define balanced?

Graham: Good in the sense that er, if you get someone to come along to the meeting, they don't harrang everybody else for two hours on one particular issue.

PQ: Right.

Graham: Who listen, basically. As well as [having political views. Communication!?!]. Er, and we've done a few of those, and so we're going to try to work with those, but it's a wider debate, it's how you get to the voice of the consumer, how do you find it, without, erm, without having to deal with the most extreme organisations. I'm not [expressing myself] very well, but all views need to

be taken on board of course, but you need to filter those views so you can find some sort of consensus, and a way forward.

In the following excerpt, Graham seems to be trying to distance himself from the output of his own department in recognition of the possibility that the general public might be hostile to it, or perhaps as a result of his own unease:

Graham: [...] one view is put forward which is quite contentious is that this technology is going to happen. If it doesn't happen in the caring European countries, it will happen in China, it will probably happen in America...

PQ: Yes.

Graham: And we're going to have to put up with the products of that, because we can't build walls around them. So what do we do, do we [reject] this product, and just back away and say we don't want it, [and watch the rest of the world go ahead with it]. I mean, I don't think we're trying to come up with answers specifically, you're pointing out these issues, and... erm, recommending that people should do something about it,

PQ: Yes.

Graham: And we'll try and help when we can. We're in the early stages of looking at these matters.

PQ: Yeah. I have come across literature from you, and the DTI, very much in a biotechnology means business vein, this idea of us falling behind the Americans, and for the pragmatic reasons that you've outlined, those are actually quite powerful arguments, but they are arguments at the same time which rather wind up consumers...

Graham: Well, I didn't quite mean it in the way I think you are. Erm, yes, we could fall behind with the technology, but what I actually meant was there will be products and techniques out there, and we won't be able to stop them coming into the UK. So regardless of whether the technology is good or bad, there will be all this stuff coming in, and it'll be cheap probably, and it'll be good stuff. What do we do about it. Erm, the retailers aren't going to be able to not buy it.

In the following section, he repeats an argument used previously in which he presents the arrival of GM food as inevitable. He contends that given this inevitability, it is preferable for the technology to be developed in the comparatively regulated environment of Europe, which in addition to dismissing moral objections as irrelevant, presents UK participation in biotechnology as a moral imperative. He then goes on to agree with a heavily prompted run-through of the arguments surrounding the power of the WTO to impose GM food. The use of these imperatives distances Graham from the statements he makes, in that he need make no claims for the moral value of what he says, nor disagree with those who oppose GM food.

Graham: [...] and coming back to what I was saying before, erm, you can have all the environmental groups you like saying you can't do anything unnatural, you can't feed it with that, you can't inject it with this hormone, erm, in the UK, or in Europe, and the South Americans or the Chinese will start doing it. They will look

for the most cost-effective way of producing the meat that retailers want globally, and that retailers source globally.

PQ: Yes.

Graham: And so the retailers are going to have to make a choice, whether they're going to buy this excellently tender, fantastic tasting meat for their customers, which is what the customers want, erm, even though it's been produced in.... what might be seen as unnatural ways.

PQ: And is it also not true to say... I'm not really an expert in this field, that the GATT and the WTO make avoiding products like that very difficult.

Graham: Yes.

PQ: Because it's got to be on the basis of safety hasn't it, not on means of production.

Graham: Right.

The following quote continues the discussion started above about the WTO. Here Graham seems rather uncomfortable with the notion that a free trading agenda, which he supports might lead to a forced acceptance of GM food. He does not attempt to portray this as beneficial, other than to claim that it is a price worth paying for free trade:

PQ: Which as a formerly lay person using this as a case study, when I read that, that alarmed me somewhat. I mean, does it bother you?

Graham: I suppose it depends on your view overall of world trade. I think I support world markets, and this being the major driver for the world's growth.

PQ: Right.

Graham: Than more restrictive, nationalistic reasons that we've had in the past.

PQ: So do you feel then, that a problem like that... well do you feel that it is a problem for a start, but if you do feel it's a problem, that it's a price worth paying for the greater good if you like?

Graham: Erm... yes, I do. I don't know whether I'm well enough informed to say whether or not world trade is a good thing for the world, erm, except that I read The Economist, and they say in there that developing countries that take on free trade as the *raison d'être* of their underlying mechanisms, do much better than the ones that don't take on free trade.

PQ: I read The Economist, but there are other publications which say the exact reverse of that, and I wouldn't profess to be able to get to the bottom of it.

Graham: I don't know, I don't know. But I mean personally, it doesn't cause me worry, I prefer to face up to the aggressive approach that the GATT and the World Trade Organisation is trying to put forward, I would prefer to face up to that and the problems it's going to give us in terms of what we've been saying, and some countries being able to undercut in terms of price, China, China is the biggest example, they'll be growing hundreds of thousands of hectares of genetically modified crops in China.

The following quote demonstrates the importance Graham attributes to science relative to other consideration, and shows him struggling to take other views on board. He presents a view of environmental NGOs, which he does not seem able to defend when challenged:

Graham: [...] They [environmental NGOs] don't seem to think, they don't seem to consider, or regard as at all valuable, the side of the [scientist] in their

arguments. They say... they come at it purely from a gut feeling, moral... standpoint. I mean, I'm a scientist, so I would say that, but...

PQ: In what way do you feel that it's ludicrous, because you feel they completely ignore scientific method...

Graham: Yes.

PQ: Or do you feel that it's ludicrous that they bring those values in at all, do you think that it's just purely a scientific argument, or should be a purely scientific argument.

Graham: Not purely, no. No, not purely, no. No. I mean there should be more arguments to it in society. But they seem to completely exclude... more or less completely exclude the... any scientific.... And so anything that scientists do... You get the feeling it's... it's Greenpeace against science.

PQ: Yes. Although interestingly the person I spoke to from Greenpeace was a scientist.

Graham: Mmm.

PQ: A lot of the people there seem to be scientists. The guy that was at the national biotech conference... [name]. He's a scientist as well interestingly.

Graham: Maybe his science is OK, if he is a scientist.

Talking about whether alternatives to genetic modification should have been considered before it was used, Graham uses a curious circular argument to make the point that it shouldn't have been. In effect he says that 'things don't happen that way, therefore they shouldn't happen that way.' He then contradicts himself by an apparently ungrounded statement that he is certainly not sure of, that these issues were talked about.

Graham: [...] I mean that's the sort of debate that's the Greenpeace point of view, that, you know, you should always look at alternative viewpoints before you go down a technological route.

PQ: Uh-huh.

Graham: Er, I don't really feel bothered about that, because it's all to do with hindsight, and the way... the way the world seems to work is that scientists, because of their quest for knowledge, come up with ways of doing things that nobody thought of before. Entrepreneurs then think, ah, there's this way of doing things, I could make some money this way, and so they start doing it. And, erm, somewhere along the line try to justify some.... especially the retailers, justify benefits, for people along.... for people who are eventually going to consume this stuff.

PQ: Yes.

Graham: Whether it be consumers, or whether it be the people growing it in the first place, erm, now.... that's really what I think. There's a good counter-argument....

PQ: That's a sort of statement if you like of reality...

Graham: Yeah.

PQ: They're talking about a hypothetical ideal. Erm...

Graham: That you shouldn't go down this route at all?

PQ: No, not that you shouldn't go down this route at all, although I think perhaps they do feel that, but that you should talk about whether you want to go down that route, before you actually go down that route.

Graham: Mmm. Oh, I'm sure people did actually, [...]

Challenged about this, Graham respond that he has been following a debate which assumes an industrial model of agriculture, but reluctantly, after some pushing, agrees that that assumption is worthy of discussion:

PQ: [...] Erm, perhaps you disagree with this, but it does seem to me that the genetically modified crops are going to have a major impact on our agriculture, and there doesn't seem to have been a debate about is this the direction we want to go in agriculture. Bearing in mind that it takes up so much of our land, and provides us with all of our food...

Graham: Yes.

PQ: That seems to me to be a very important question to talk about.

Graham: Er... yes, er...

PQ: And rather different to the early 70s debate that you were talking about.

Graham: I [???]. I suppose that the debate that I've been watching, is how do you, increase... given the realities of life, how do you increase the efficiency of your production system, how do you feed the third world, how do you produce new varieties that are going to benefit the consumer [...]

Probed further about his sympathy for the industrial model of agriculture, Graham states that yields can probably continue rising *ad infinitum*. Challenged about this, he immediately backs down and concedes that the point is the subject of some debate (which he elaborates on):

Graham: [...] Traditional breeding, as we all know has managed to increase yields of cereals...

PQ: It's huge isn't it...

Graham: Almost in a straight line for the last thirty years. Now there's no reason to assume that that will drop off.

PQ: Is there not?

Graham: Well....

PQ/Graham: [confused section]

Graham: There's a debate.

Moving on to talk about environmental values, Graham's responses are perhaps unexpected given the priority he gives to scientific arguments:

Graham: [...] I hold the same fundamental beliefs about the environment as everybody else does, I mean....

PQ: How would you articulate those?

Graham: One would like to think that um, when the world was created with Adam and Eve and the various species that um, we haven't lost any of them. Clearly we're losing how many million it is per hour in the South American rain forest.

PQ: It's an awful lot, isn't it? I don't know what the numbers are.

Graham: Scary, and then.... And you wouldn't like to see that happening with biotechnology, you know.

PQ: But why, why does that not?.....

Graham: Why is it a problem? Um, I suppose it comes down to things like um, tampering with nature type of issue, and I'm not a particularly religious person but you know we inherited as a human species that sort of issue.

PQ: Right. Um, talking as an individual um, are you comforted at all by the prospect of species which are disappearing, having their genetic make-up preserved in gene banks, is that at all comforting? Or is that irrelevant? Or, does it, I mean, in theory we are able to spot every single species that was about to become extinct, get a sample and preserve it, would that make this issue go away as a problem for you?

Graham: No, of course not, it wouldn't make it go away but it would leave you slightly less upset

Questioned more directly about his sympathy for notions of intrinsic value, Graham is enthusiastic in voicing his support for it:

PQ: [would you have sympathy with the idea that] nature has an intrinsic worth and an intrinsic value and whether or not it's useful to us is not irrelevant but there is rather more to it than that.

Graham: Oh yes, yes, and I would agree with that.

Graham's views are strongly science-based, and his interpretation of that science is favourable to GM food. However, throughout the interview, those views seem not to be robust; he consistently fails to defend them when challenged. His unexpected sympathy to non-scientific perceptions of environmental problems seems to allow him to insulate this from his professional life, dominated as it is by scientific considerations. Thus a compartmentalisation of work and personal values seem to allow Graham to maintain his conflictual worldview, but this compartmentalisation seems to be rather fragile, and will perhaps break down if he is exposed and gives consideration to arguments from his opponents which use ideas closely related to his values.

6.7 Conclusion to Chapter Six

This chapter concludes the vignettes describing each of the interviews. Given the relatively small sample size, one of the most important aspirations of this project is to examine the narratives certain individuals use to maintain conflicts between their values and professional activities. Given the diversity of these narratives, it would be unrealistic to attempt to standardise either the interviews or their presentation here. While generalisation from these findings is problematic, this chapter has unearthed devices which are used. The next chapter will examine these devices in an attempt to draw together the somewhat scattered evidence described in this chapter.

Chapter Seven: Theme Based Analysis

7.1 Introduction

This chapter builds on the narrative structures described in Chapters Five and Six by building a theme rather than case based analysis. It examines the arguments used by respondents to rationalise their position, with particular emphasis on cases where there is an apparent difference between their values and their actions, considers why such arguments are effective devices and speculates on why others are not. It gives some emphasis to how the use of similar arguments differs between conflictual interviewees, and those who are against the technology both in terms of values and actions, to uncover how the same fundamental values can lead to differing actions. It concludes by considering what makes the commonly used arguments attractive to utterers, in contrast to a selection of arguments which could have been used, but were not.

7.2 Food Security Arguments.

One of the most pervasive arguments used by conflictual interviewees to justify their support for genetically modified food is the moral imperative of feeding hungry people in poor countries. Implicit in this argument is the construction of a moral hierarchy, with feeding the hungry at its apex. It allows the utterer to side-step opposing arguments by removing the need to engage with them at all, and thus removing also the possibility of conceding ground to those opponents. The utterer is able, therefore to present her work, which may be the marketing or regulation of a GM food or crop, without reference to the content of that work, but as a moral crusade, paving the way by the use of simple, early versions of GM food for more complex, socially useful developments in the future. The use of this moral hierarchy often marks a change in discourse by the utterer, away from arguments presented as dispassionate and logical, using the jargon of their

profession, into more emotional language, sometimes including personal attacks on opponents.

Jim: [discussion of Norwegian consensus conference] so they're saying stop the research, but what about all the people in India, in China, in Africa, who haven't got enough, who are starving. They're prepared to sit there and say, I'm not going to get involved. I think that's absolute nonsense.

This emotionalism is the site of some tension, as opponents of GM food are frequently attacked by conflictual and anthropocentric respondents for using emotional (in contrast to logical) arguments, which they consider render those arguments irrelevant.

Brian: [...] And there are genuine scientists who let their emotions overtake their scientific knowledge. And I think there are genuine scientists who let their emotions overtake their understanding of their amount of scientific knowledge, [...]

Graham: [...] They [Greens] don't seem to think, they don't seem to consider, or regard as at all valuable, the side of the [scientist] in their arguments. They say... they come at it purely from a gut feeling, moral... standpoint. I mean, I'm a scientist, so I would say that, but....

PQ: In what way do you feel that it's ludicrous, because you feel they completely ignore scientific method...

Graham: Yes.

PQ: Or do you feel that it's ludicrous that they bring those values in at all, do you think that it's just purely a scientific argument, or should be a purely scientific argument.

Graham: Not purely, no. No, not purely, no. No. I mean there should be more arguments to it in society. But they seem to completely exclude... more or less completely exclude the... any scientific.... And so anything that scientists do... You get the feeling it's... it's [NGO] against science.

However, the dismissal of opponents' arguments as the petty concerns of the well fed is arguably of secondary importance to the utterer. Using the moral imperative of feeding hungry people, the utterer is able, not only to dismiss the arguments of his opponents, but also to *agree* with them, both on a public and private level. Aside from the obvious advantages this confers in debate, it allows the utterer to maintain her conflictual worldview. Under the banner of pragmatism and a moral crusade, personal misgivings about GM food can be explicitly sacrificed for the greater good. Derivations from personal values which conflict with GM food can be presented as abstractions of little relevance in the 'real world':

Eric: I have the problem as a pragmatist and a cynic that given our population, given the economic constraints on what we do, there's almost nothing I can do as an environmentalist that will help.

In every case, the conflictual respondents who used this argument did so without appearing to ground their statements with claims of expert knowledge of the subject, which often marked a departure from the style they had used when discussing other subjects. In the following passage, Sue describes this lack of understanding among her colleagues, several of whom were also interviewees:

Sue: [...] well [Chris] will obviously tell you it will feed the world because that's his business, I have this out with [Chris] constantly, saying that if you are going to say that, can you please actually demonstrate which crops you are talking about, and what sort of transformations, and how it all works, and they [members of Sue's advisory committee] have no notion of the politics of food.. I think in general, that most of hunger is about distribution and access, [...]

Eric begins the following passage by describing his own background in chemical agriculture, and uses that knowledge to explain why agriculture in Europe has been able to increase yields dramatically since the medieval period. The two grounded statements he makes here, that crops remove nutrients from the soil, and that medieval agriculture was phosphate limited appear to derive from his training in industrial agriculture. In contrast, his comment that sustainable agriculture is 'an awful lot of guff' is ungrounded. He then uses this argument to imply that poor countries, in order to feed their populations, have no option but to adopt western methods, including Genetic Modification.

Eric: Well [pauses] my background - I did a diploma in agriculture first, and I have a very strong feeling for the agricultural industry.

PQ: Yes

Eric: The biggest problem I have is that you very seldom see in any of these debates a proper understanding of feeding immense populations.

PQ: Uh huh

Eric: We see an awful lot of guff about how you can go to sustainable agriculture. That's total nonsense. Because every time you take a crop off the land you take nutrients out of the soil

PQ: Uh huh

Eric: And if you go way back to medieval agriculture it was phosphate limited. And it was only when we started adding fertilisers and so on that we could actually begin to get yields up.

In the following excerpt, having given considerable technical detail about GM crops, here he gives no such grounding, other than the weak assertion that he is sure those ideas were tried.

Graham: I suppose that the debate that I've been watching, is how do you, increase... given the realities of life, how do you increase the efficiency of your production system, how do you feed the third world, how do you produce new varieties that are going to benefit the consumer, [...]. How do you do that. Now, you could say, right well we'll... we're not going to look at the new technological opportunities, we think we can do... we can spray it with something, we can er... cultivate it in such-and-such a way, erm, and I'm sure those ideas were tried, but actually, there's no.. there's no way to make step changes by using the traditional techniques we've seen so far.

This lends credence to the hypothesis that respondents were using hunger to post-justify action and discourse they were using for other reasons. It is perhaps reasonable to assume that had they constructed their stance on GM food from this argument, they would have done so only after grounding those arguments in claims of knowledge.

The above excerpts contrast with the following, where Anne locates the cause of hunger as poverty rather than scarcity and describes poverty as structural. She uses this to argue that a technical solution to hunger is unlikely to be effective

Anne: There's poverty everywhere and poverty will not be solved by genetic engineering. If they could prove.... erm, that it will alter... erm, the poverty structures and everybody will be well-off, well then talk to me, then I might speak up for it [...]

Arguments relating to hunger were probably the most emotionally charged sections of the interviews, regardless of the stance taken by the interviewee. For those in favour of GM food, this argument seemed to be the most powerful legitimator of their work, while for those opposed, the argument was the most upsetting used by those in favour. The lack of grounding for the arguments used by those in favour of the technology gave those arguments the character of a moral life raft, since a life raft, however leaky, is preferable to drowning.

7.2.1 The Green Revolution

Interviewees' enthusiasm for GM food as a solution to world hunger depended to an extent on their view of the efficacy of the Green Revolution at improving food supplies in the past.

Sue: [...] You know, they would like to really think that a technological advance translates straight into a benefit, and we... you know... I find it hard given the green revolution, if we hadn't had the green revolution experience I could understand it better that they feel like that, but the fact of the green revolution and the things that went wrong with that, I would have liked to think [that it would] be more in plant breeders' minds but I don't seem to see that it is. [...]

Simon makes a similar point, although unfortunately discussion of detail is avoided by reference to and agreement with the writing of Vandana Shiva, whose critical stance on the green revolution and genetic modification is well known among environmentalists.

Simon: [...] people have had to resort to genetic engineering, really to solve problems of a non-sustainable developments in agriculture basically: agro-chemical based agriculture...

PQ: Yes...

Simon: is a non sustainable system of agriculture, despite all of the increased yields it has produced...

PQ: They can often be transient, can't they.

Simon: They could often be very transient and with devastating effects on the environment.

PQ: And it depends how you measure yield as well

Simon: And it depends on how you measure yield. You're clearly very familiar with that already

PQ: I've read a bit of Vandana Shiva..... so,

Simon: Exactly, she's the ideal person to read on this. And so... really genetic engineering is seen as the fix for all the problems that have been... er... created by... er... very damaging non sustainable systems of agriculture, and... well it is... and even that is not going to work, that's also clear. Genetically engineered products erm .. are not going to be the answer.

If the Green Revolution is seen as a success, then support for a continuation of the same trajectory (see Chapter Three); the application of Western agricultural technology to developing regions is more likely. Those interviewees with a favourable view of the Green Revolution point towards the introduction of modern crop varieties leading to higher yields, and use the same argument to promote GM food crops, but this is based on a grounding only in technical detail. Critics such as Simon use comparatively complex arguments grounded in a multitude of contextual information. In addition, Eric makes the point that as a

career geneticist, he is unlikely to be critical of genetic modification. He, and various other interviewees are also experts in industrial agriculture, and so are unlikely to question its validity.

Thus how the interviewee conceptualises the Green Revolution colours their sympathy or otherwise for the introduction of GM crops. Positive attitudes towards the Green Revolution tended to come from respondents who ground their views in technical detail, whereas negative attitudes tended to correspond to groundings in both technical and contextual detail.

7.3 Notions of Progress

Allied to specific concerns about solving world hunger were differing conceptions of the notion of ‘progress’ in a more general sense. In the same way that hunger was often used as a moral imperative over-riding all other concerns, progress was used by conflictual respondents as an historical imperative, which they neither could nor should attempt to divert or stop.

Jim: I think that is arrogant, [banning GM food] I think it’s trying to stop progress, and I think it will just lead to the thing being driven away from responsible, thinking, ethical people, into back streets where people will be doing things without telling us.

There was to some extent a relationship between attitudes to GM food and progress in a more general sense; those with a positive attitude to the former often had a similar attitude to the latter, and *vice versa*. Clearly this is related to the broad categorisations of respondents; anthropocentrists and technocentrists are predisposed to a positive attitude both to technology in a general sense, and specific examples, in this case, GM food.

Andrew: [...] And I think, sorry, I think ultimately erm, that sort of stance [banning GM food] means you are turning down an opportunity for potential in the future and it really does come back to this, you know, it’s this fundamental philosophy really, do you believe in progress for mankind or not?

Conversely ecocentrists may not be against technology *per se*, but are likely to be uneasy with the variant of progress being pursued, of which GM food is an example.

Anne: [...] if we think genetic engineering is a method, valid to produce food or to alter plants this will still be a good method in ten years time when we know more about it, so what's the rush now? And this is why I'm putting my foot basically on the brake and saying "It's absolutely too risky and especially if there's no need whatsoever." Genetic engineering for genetic diseases, that's different. The risk is going to be taken by the individual who will have the treatment [...].

Simon: [...] if I can sum it up in a way, we appreciate... people like me would appreciate genetic engineering as a...as a crude but nevertheless useful research tool, which we can work on, er, use and develop further, for key clinical applications where there is a clear benefit to be gained. It makes me therefore very worried however, when I see the same crude technology, nevertheless, now being used to generate genetically engineered organisms whether they be viruses, bacteria, plants or animals which are then released into the environment and then which enter the food chain, then that worries me a great deal because it is a crude technology, erm... it is naïve to think that you can predict all of the outcomes from your genetic manipulations with this technology at present. [...]

Thus the notion of 'progress', rather than being rejected outright, becomes a choice between a multitude of variants, whereas for Andrew and Jim it is a more one dimensional concept to be accepted or rejected.

For conflictual respondents, notions of progress were sometimes used as a way of rationalising their conflictual behaviour. Progress was framed in two ways in order to do this. Firstly as a moral imperative it was used in a similar way to food security arguments to present other considerations as irrelevant (see for example the quote from Jim above). Secondly it was as a morally ambivalent but irresistible force which regardless of the feelings of the individual just had to be accepted.

The first case relied on the framing of previous technological developments as beneficial (compare with the use of the Green Revolution), and the assumption that such benefits would continue to accrue if the same trajectory were followed. A variant on this theme presented genetic modification as an inconsequential advance in plant breeding or food production, with the implication that for the public to withdraw consent at the GM stage is illogical.

Emma: I don't see the biotechnology issue as particularly.... erm... important.... erm... most of it isn't terribly important on ethical grounds we have been breeding new plants and new cultivars since man started agriculture.... erm... so it's again another piece of the jigsaw. And the new technology is that we are now able to take genes from one organism and put them into another.

Aside from the implicit assumption here that previous advances were beneficial and that further advances would continue to be so, users of this argument made

the assumption that the absence of objections from the public implied consent, whereas it appears that ignorance and trust in regulators and scientists were the prevalent causes of non-objection.

7.4 Expert Legitimacy

The use of arguments surrounding hunger also seemed to depend on the legitimacy the utterer conferred on various sources of information, and the access they appear to have to those sources. Jim is instructive here. In the following quote he gives considerable detail of arguments he has heard from the biotechnology industry, and mentions he is shortly to visit the US as the guest of a biotechnology company, when presumably he will gather more information from them:

Jim: [...] they [a biotechnology company] argue you see that the actual bean is in no way different in functionality terms, in chemical terms, er... physical terms than the bean from a non genetically modified source. So from their point of view you see, they could argue that they were... and I mean genuinely they'd done all of the work, and er.... I mean we're going over to the States to spend a couple of days with [the biotechnology company] [...]

This contrasts with his portrayal of the arguments of environmental groups:

You turn round and say you don't need it. I mean if you take that, we could still be in caves, with clubs.

Arguably, then, the biotechnology industry have gone to considerable lengths to help individuals such as Jim maintain their conflictual worldviews by making information accessible and credible. Sally makes the point that the legitimacy Jim feels commercial organisations have, a perception she seems to share, is not shown by the public:

Sally: Well, we have a lot of faith in our own scientific advisors and we know that they work closely with other scientists in industry, and so we tend to trust their judgement and they can review the different data that there is and advise on what the pros and cons of it are [...]

Sally: [...] I think the credibility of scientists in industry even is not very good... erm... there are surveys around which tell you....

PQ: The FDF one?

Sally: Yes. Industry always.. we are not seen as a credible source

PQ: Less distrusted than government!

Sally: Ha ha ha, we are better than somebody, but I think we are conscious that people tend to think that well, if industry say it they are just representing vested interests [...]

The arguments used by Jim and Sally contrast with those used by interviewees who oppose GM food. In the following excerpt, Carol, who, like Sally works in the mainstream food industry, explains how she uses ‘gut feeling’ to inform her interpretation of science, and that she has consulted experts from ‘both sides’

Carol: [talking about the feeding of meat derivatives to cows which brought about BSE] It’s wrong. It is basically wrong. And the scientists could spend years trying to persuade you that it was right, but at the end of the day, I think, you know, most people’s gut feeling would say, whatever you say, I’m sorry, I don’t want to know, I don’t... This is really why we have taken a stand on genetically modified food. [...]

PQ: Yes.

Carol: So I have actually spoken to so called experts, from both sides, to try and understand what the situation is. It has just, it has clarified our thinking, totally, and made us realise that we were absolutely right in what we’re doing.

In this case, Carol seems to be aware of information coming from several different actors in the debate, from which she has decided upon her opposition to GM food. Although it may appear that Carol has simply reversed the legitimacy Robin affords different actors, recall that Carol works within the mainstream food industry, and is accustomed to dealing with, and using new food technology. It would therefore seem reasonable to assume that she does not simply reject all industry sources, but accepts or rejects individual sources on their merits.

7.5 Economic and Trade-Related Arguments.

Economic and trade related arguments tend to be used to justify acceptance of GM food by the utterer, because he is helpless in the face of more powerful interests. Like the moral arguments described above, this is used to side-step rather than to engage in debate with critics, but unlike those arguments it is not generally used to elevate the utterer or his point of view above that of his opponent.

The main argument used in this area was to cite the power of the WTO and/or GATT to force GM foods onto a public, willing or otherwise. In the following passage, Eric uses this argument to portray non scientific arguments as impotent, but does not have to criticise them in order to do so. Indeed he can and does sympathise with non-scientific arguments and can do so without undermining his point in this passage, because he also presents himself as an impotent victim in the face of the WTO:

Eric: And those [GM food crops unregulated in the US] will enter world trade. because we regulate on the basis that they're genetically engineered, there's going to be all sorts of problems in the future. At the farmer level, if something is regulated, you don't know what it is anyway. So when it comes to inserting those commodities into world trade, there's absolutely no system in the future that is going to segregate. Unless Europe were to say we refuse to import any genetically engineered products. But the World Trade Organisation would immediately be invoked, and Europe would lose.

PQ: But Norway has done that, I read in the paper recently.

Eric: Well, it may be trying to do it,

PQ: But you think it will...

Eric: but if it went to the World Trade Organisation, to the world court on trade, it will fail, because the criteria for the world trade are that you may only block things on the basis of safety.

PQ: Mmm

Eric: You may not block them because emotionally you don't like them, which is what it would actually come down to in a legal defence. And people are not properly understanding that. OK we could say we don't give a fig for world trade. We will ban, we will force a total renegotiation of world trade. I don't see us doing that.

PQ: It's not very likely is it really.

Eric: Highly unlikely. And so I'm immensely frustrated at the inability of governments and industry and the EC to properly communicate with people, and say to them, you know, this is the real world folks. Out there other countries are treating this as a new breeding technology, there's no point getting excited about the new technology *per se*. We must concentrate only on those areas where there are human risks.

Graham uses the same argument in a similar way, but uses it, after some prompting, to question the use of global free markets. Although he concludes that the likely outcome of a WTO ruling on free trade is a price worth paying for a trading system he supports, it does not seem to be an argument he is entirely comfortable with. Graham was a fluent and decisive interviewee, but here he seems more hesitant, and appears to be navigating carefully through the site of some conflict.

PQ: And is it also not true to say... I'm not really an expert in this field, that the GATT and the WTO make avoiding products like that very difficult?

Graham: Yes.

PQ: Because it's got to be on the basis of safety hasn't it, not on means of production.

Graham: Right.

PQ: Which as a formerly lay person using this as a case study, when I read that, that alarmed me somewhat. I mean, does it bother you?

Graham: I suppose it depends on your view overall of world trade. I think I support world markets, and this being the major driver for the world's growth.

PQ: Right.

Graham: Than more restrictive, nationalistic reasons that we've had in the past.

PQ: So do you feel then, that a problem like that... well do you feel that it is a problem for a start, but if you do feel it's a problem, that it's a price worth paying for the greater good if you like?

Graham: Erm... yes, I do. I don't know whether I'm well enough informed to say whether or not world trade is a good thing for the world, erm, except that I read *The Economist*, and they say in there that developing countries that take on free trade as the *raison d'être* of their underlying mechanisms, do much better than the ones that don't take on free trade.

PQ: I read *The Economist*, but there are other publications which say the exact reverse of that, and I wouldn't profess to be able to get to the bottom of it.

Graham: I don't know, I don't know. But I mean personally, it doesn't cause me worry [...]

The following quote illustrates the conceptualising of genetic modification exclusively as a business opportunity. Graham does not dismiss other arguments here, but it is clear that in the past he has not taken them into account professionally. Recall from his vignette in Chapter Six that he is trying, although not without some difficulty, to broaden his perspective:

Graham: [...] Erm, we've only recently decided I think that we've got to make a much bigger effort to involve these consumerists in our discussions. It's not that we've excluded them, it's just that the focus has been on getting industry views on what is needed from the scientists, that's the whole purpose of the foresight thing, is getting more exploitation of science by industry.

However, this position was unusual. The popularity of arguments citing either moral justification for GM foods, or powerlessness to stop them perhaps illustrate

why this argument was so little used. Here, Graham is not denying agency as was the case with the more popular arguments, but describing a decision, which presumably could have been taken differently, and therefore does not absolve himself of responsibility for it. During the interview, this argument seemed to be the source of some tension for Graham; he seemed to accept that a broader outlook was required, but was struggling to put that acceptance into action. That respondents did not use this argument does not mean that they did not subscribe to its tenets; they may simply have been too embarrassed, in the face of an emergent debate about the ethics of GM food, to articulate it, particularly in an interview situation where ethics was being discussed.

An extension of the arguments outlined in this section is related to the global nature of technology. Jim and Graham are making the point in the following excerpts that GM food will be produced, and so it is better that it happens in a well regulated environment:

Jim: I think that is arrogant, [banning GM food] I think it's trying to stop progress, and I think it will just lead to the thing being driven away from responsible, thinking, ethical people, into back streets where people will be doing things without telling us.

Graham: [...] If it doesn't happen in the caring European countries, it will happen in China, it will probably happen in America...

PQ: Yes.

Graham: And we're going to have to put up with the products of that, because we can't build walls around them. So what do we do, do we [reject] this product, and just back away and say we don't want it, [and watch the rest of the world go ahead with it].

This argument retains the sense of powerlessness used above, but adds to it a moral imperative for 'making the best of a bad job'. It doesn't seek to deny agency entirely, but concedes only a limited form, within constrained possibilities for action.

7.6 Amorality of Science

A line of argument one might have expected to be used, but which in fact was used by none of the interviewees was the claim that scientific research is amoral, and that morality enters the arena only when the science is applied. Use of this argument could allow a scientist to remove his work from moral consideration, and, thus defined as a purely abstract exercise, contend that no conflict was possible with his value system. While the development and use of the atomic bomb shattered the innocence of science, this argument has been visible in the media, particularly through the efforts of eminent biologist Lewis Wolpert¹. Rifkin gives the example of Nobel Laureate Dr. David Baltimore who opposes *writing into regulations statements about 'morally and ethically unacceptable' practices because these are subjective grounds and therefore provide no basis for discussion.*² However, his fondness for this argument does not seem to be shared by his fellow biologists, many of whom were quick to point out areas of research they would not be prepared to engage in on ethical grounds.

Alan: [...] I would find it difficult to work on certain things, because I see them as not helpful to society. I would... I would find it very difficult to work on tobacco breeding, for producing tobacco for people to smoke. If it was tobacco to produce pharmaceutical substances, I could do that. But I would have on an ethical, moral grounds, I would have difficulty doing that. I would erm... I don't have problems with herbicide tolerance, now some people have problems with that, because they see that that could lead to increased dependence on herbicides. [...]

In the following passage, Emma makes numerous references to how her own values have driven her scientific research, with the implication that her research has a moral dimension:

Emma: I suppose I am a pragmatist and I look at the situation at the moment and look for ways in which we can take care of the bits that we have ruined and reduce the ruination of aspects that before it's gone too far.

PQ: Is there any kind of connection between those sort of ideas and your professional work do you find one drives the other, are they separate, do they conflict, do they agree.

¹ Wolpert expressed this position on the BBC Panorama programme in May 1999, and at the Eye of the Storm: Artists In The Maelstrom Of Science, International Arts and Science Conference, 19th & 20th February 1998, at the Royal Institution, London (Quaife 1998).

² Rifkin 1998 p. 102

Emma: I think one drives the other basically I am interested in sustainable agriculture: we need food but I think we also need to erm... produce that food in an environmentally friendly way.

PQ: So is that why you have chosen the specialism that you have, is that how it works.

Emma: Erm.... yes I think as a scientist I had the opportunity to go into perhaps physiological experimentation with animals and I definitely didn't want to do, erm... I prefer to work with whole animals, erm... I prefer to work in an area of ecology and behaviour I feel most comfortable with that erm... I am interested in issues that are more practical like agriculture, I things that I am comfortable with because it brings personal interests in natural history to practical benefit of mankind.

7.7 Dismissal of 'Emotional' Arguments

Some interviewees contrasted the discourse of science, which they considered legitimate with other discourses which they dismissed as irrelevant, typically describing them as emotional. While both those for and against GM food used scientific arguments, or at least gave them considerable credence, it was primarily those in favour of GM food who dismissed their opponents as emotional and thus irrational. However, those who used this device did not necessarily deny their own emotionalism or irrationality, merely claiming that it had no place in considering the merits of GM food. Thus this became another arena in which conflict between action and thought could be sustained, by the exclusion of non-scientific discourse. Conflictual interviewees however rarely took advantage of this device, perhaps because it does not really conceal the conflict, nor does it provide a moral imperative for dismissing non-scientific discourse. For example, in the following excerpts, Jim responds favourably to the notion that the inclusion of non-scientific considerations in decision-making improves the process, which he ties in to his own feelings about the technology.

[...] And I think it [the UK consensus conference] helps government enormously. Because it gets then away from this emotional approach...

Jim: I mean we all have emotions about this [GM food], we all sort of feel this is scary.

PQ: I think it can be a problem that you have a decision-making process, particularly among scientists which is very explicitly dehumanised. I mean, when you talk to scientists about it, often the scientists that have spoken to me are actually very proud of how they keep their human feelings outside of their professional judgement. You then work through this process, and then come up with a decision which human beings are very unhappy with, and I don't think that's a great surprise when you dehumanise the process. I think perhaps the benefit of consensus conferences is to bring that human element back in.

Jim: And that's very important.

PQ: I mean would you go along with that. I don't want to put words into your mouth.

Jim: It's interesting. I think you are strong when you say the scientists dehumanises the process. To some extent they have to in the sense of, they have to focus on the science that they're doing. Therefore they mustn't go outside. It's like a surgeon.

PQ: Yes.

Jim: He can't say he's operating on the body, he's operating on a particular organ. It could be anything. I mean, because otherwise you wouldn't get out of bed in the morning. If you didn't sort of.... I mean we're all the same.

PQ: Of course.

Jim: I mean it's like sort of when you drive a car, you know there's risk, but you exclude that risk because you're focused on actually driving this car. Erm... but... I think it's interesting,

Elsewhere in the interview, he describes the problematic nature of the meeting of these two discourses. On the one hand, it clearly does not fit with the way in which he is accustomed to working professionally, and is therefore difficult to assimilate. On the other hand, he obviously sympathises with such discourse on a personal level, and professionally understands that his company must accommodate the wishes of the public, however unscientific those wishes might be:

PQ: Do you find dialogue with people like that [environmentalists] constructive, or are you just talking at cross purposes?

Jim: [long pause] It's not constructive, in the sense that you know they are totally on this emotional plane, erm, but you see to some extent, I wouldn't want to destroy that, and the reason why is because, when you're in an industry which has a particular focus, which is producing food and making money, there are times when you actually do get... you know, your pendulum swings too far to one way, and it's good to have somebody who's completely nutty and emotional with the issue, because it brings you back to say, well wait a minute, have we really got this right? Classic example, [Professor Richard] Lacey, back in the early 90s,

Similarly, in the following passage, Graham criticises opponents of GM food for being unscientific, but his use of this argument to dismiss Greenpeace is half-hearted. He implies personal bias arising from his own status as a scientist, and is quick to acknowledge that the debate on GM food should encompass non-scientific issues.

Graham: [...] They [Greens] don't seem to think, they don't seem to consider, or regard as at all valuable, the side of the science in their arguments. They say... they come at it purely from a gut feeling, moral... standpoint. I mean, I'm a scientist, so I would say that, but...

PQ: In what way do you feel that it's ludicrous, because you feel they completely ignore scientific method...

Graham: Yes.

PQ: Or do you feel that it's ludicrous that they bring those values in at all, do you think that it's just purely a scientific argument, or should be a purely scientific argument.

Graham: Not purely, no. No, not purely, no. No. I mean there should be more arguments to it in society. But they seem to completely exclude... more or less completely exclude the... any scientific.... And so anything that scientists do.... You get the feeling it's... it's Greenpeace against science.

Likewise Chris, a scientist, makes no attempt to present himself as dispassionate, and is quick to articulate the contrast between the myth and reality of the scientist (and businessman):

I suppose we'd like to think that we're totally rational. Of course we're not rational. Erm.... you know.... just as in your university, emotions are at play. Lots and lots of different emotions.

7.8 Conclusion to Chapter Seven

Despite the diversity of interviewees who can be categorised as conflictual; they hold ecocentric values but behave professionally (in the context of GM food) in ways which are inconsistent with those values, a remarkable homogeneity of discourse is evident when those individuals construct narratives to rationalise this conflict. Interviewees are highly selective about the arguments they will use to justify their internal conflict, and are unanimous in avoiding certain arguments which they might have been expected to use.

The popular arguments were those which enable the utterer to side-step debate, either internal or external about the desirability of GM food. In a sense, it is difficult to envisage any other strategy that could be taken - given that the interview setting removed the option of simply not considering the issues, and that interviewees were unlikely to be willing to portray themselves as logically inconsistent, dismissing the conflict as somehow irrelevant was the only course open to them.

This dismissal took two forms; the first based upon a moral imperative which took precedence over all other moral considerations, thus dismissing them as irrelevant, and the second based upon the powerlessness of the utterer to prevent the arrival of GM food.

Arguments which did not show either of these characteristics were not used. Inevitably, the content of the interviews was heavily influenced not only by the interviewees, the subject of the thesis, but by the interviewer. It is possible therefore that certain arguments were not used because the interviewee was not given the opportunity to articulate them. However, while this is likely to be true for some of the interviews, given the length (between 1 and 2½ hours) and the unstructured nature of the interviews, it is implausible that this mechanism could account for non-use of these arguments across the whole study. Certainly, throughout the interviews, every effort was made to allow the interviewees to explore as fully as circumstances would allow, the arguments they used to rationalise their stance on GM food. Opportunity and encouragement was always given for interviewees to expand upon their answers, allowing them to introduce topics into the interview as they saw fit.

In most cases, food security arguments relied on a solely technical interpretation of world hunger. The assumptions were made that GM crops could provide additional food for the hungry, and that given that the potential existed for such a use, that it would in fact be used in that way. Those interviewees with a more contextual interpretation of world hunger did not use this argument, and indeed often used it to argue against GM food on the basis that it would exacerbate hunger. This group tended to view hunger as an outcome of international trading patterns, poverty and access rather than one of absolute scarcity. Likewise, they tended to view GM food as an instrument of control by large corporations rather than simply a value-neutral technological tool. Similarly, citing GM food as a part of the moral imperative of 'Progress' assumed a non-contextual view of this concept as something to be accepted or rejected, rejecting the notion that progress could take many forms, and presented therefore a multitude of options. Objectors to GM food tended not to reject technology and hence progress *per se*, but to reject certain aspects of it, and so did not fit the stereotype into which they were commonly placed by conflictual interviewees. Thus conflictual interviewees using hunger to rationalise their position did so by divorcing GM food at least in part, from its context and thus side-stepping many of the more critical points made by objectors to the technology.

Arguments based on powerlessness in the face of powerful corporations and global trading systems were not the source of overt disagreement between conflictual interviewees and those against the technology in terms of both values and actions. Both tended to agree about the nature of this perceived threat, differing only in the action they took as a consequence of it and how damaging they felt the use of such power would be. Conflictual interviewees saw little point in engaging in a struggle with a force so powerful, while those against the technology saw resistance to it as a viable strategy and acted accordingly. The main difference between the two groups, albeit less clearly defined than was the case with the 'hunger' arguments, was the degree of complexity of their understanding of the issues. The conflictual interviewees tended to view GM food as an unexpected, perhaps unwelcome side effect of an otherwise beneficial

trading system. Those against GM food tended to see it as an inevitable result of a trading system they saw as harmful; for this group the arrival of GM food had more historical consistency and was more systemic. Indeed for many, the purpose of the current system of international trade, and of GM food is the same - that of control by large corporations.

This chapter also considers two arguments which could have been used but were not. Clearly any kind of analysis of what was not said will be problematic since the range of what was not said is infinite. The chapter is therefore restricted to arguments which might have been expected, given their appearance in the media, or for other purposes within the interview material. Both related to the status of science: the first presenting it as outside of moral consideration, the second presenting it as the only legitimate input to debate on GM food. The reasons why they were not used can only be speculated upon, since the question was not addressed during the interviews. However, both arguments endow the utterer with a sense of agency, and thus responsibility for their position which the popular arguments deny. A user of these arguments could have decided that science has a moral dimension and act accordingly, and could do so within a well established school of thought. Similarly she could accept the validity of non-scientific input, and join a body of opinion which considers this to be valid. However, there exists an overwhelming consensus that people should not starve, and thus an individual does not realistically have the option of taking up a position in opposition to this, and thus the sense of agency is removed. In the case of arguments relating to powerlessness, the utterer is explicitly stating that he has no agency. Therefore we can conclude that, in general, conflictual respondents rationalise their value/action conflicts by denying agency in the realm of their actions, and thus denying any moral need to act according to their values. Here the selection of interviewees is of critical importance. The sole criterion was the influence each interviewee had within the debate, which gives this group far greater agency than the general public who perhaps have more reason to present themselves as helpless.³

³ See for example Grove-White *et al* 1997 p. 53

Chapter Eight: Conclusion

8.1 Summary

Concern for environmental damage can be manifest in two broad categories. It can be conceptualised as a series of technical errors in humanity's interactions with the environment, which can be solved incrementally by technical means. Framed in this way, environmental damage is of comparatively minor importance, since any damage can be detected, and corrected by an appropriate technical innovation, or if the damage is slight enough not to pose a threat, not corrected at all. This model is arguably dominant on a societal level, and is visible in the way that specific environmental problems are managed by various national and international bodies, with varying degrees of success on a largely ad-hoc basis. The second category conceptualises environmental damage as systemic; the result of an exploitative humanity/nature relationship. It posits that the dominant societal paradigm considers non-human nature as separate from humanity, and a consumable good to be used as humanity sees fit. Thus environmental deterioration can only be halted by repositioning humanity as an inseparable part of nature, which would redefine damage to non-human nature as damage to self. Outside of some parts of the environmental movement, there exists little evidence of widespread human behaviour based on this model at present, although historical evidence exists of now-vanished cultures who appear to have behaved in this way. These two worldviews can be described as anthropocentric and ecocentric respectively.

The practical difficulties surrounding tackling environmental damage according to the second model are far greater than for the first. The first model does not require fundamental societal change, and can tackle environmental problems on the basis of evidence of, or risk of harm, a body of opinion that the problem under consideration needs to be solved, the existence, or potential to find a technical solution, and the possibility of overcoming the interest groups which benefit from the environmentally damaging activity. While these obstacles are usually

formidable, and often insurmountable, the possibility for action remains. In contrast, the second model cannot be acted upon by existing institutional frameworks, steeped as they are in the dominant social paradigm, and the possibility of action based on this model is therefore limited to the activities of concerned individuals.

Environmental thought can exist on different levels, from statements about everyday activities to fundamental values. In theory, it is possible to link these two extremes by interrogating an individual to discover how their values are linked to their everyday activities. In practice, this is less straightforward; people may not have considered their values and their implications, or may act in ways which contradict their values. Furthermore, the constant flux and complexity of such a linkage would make any but the most cursory investigation impossible. However, it is possible to find simple linkages between the Christian belief that God gave man dominion over the earth, and the use of fossil fuels to power motor cars. Likewise, a linkage could be found linking a belief that nature has intrinsic value and vegetarianism. Clearly, most behaviour in industrialised countries is anthropocentric, and so one would expect most individuals to have values which are fundamentally anthropocentric. However, research by Boster, Kempton and Hartley shows that this is not the case; in fact a majority have what could be termed ecocentric values, which presumably clash with their anthropocentric behaviour. Furthermore, there appears to be no alternative consensus of anthropocentric values; they exist, but no single formulation is dominant, as is the case with ecocentric values. According to Craig, Glasser and Kempton, this inconsistency between values and action is replicated among advisors to the EC on environmental policy, who find there is no place for their values in their professional work, and find as a result that they sometimes offer advice with which, on a fundamental level, they disagree, since it fails to accommodate their ecocentric values.

The production of Genetically Modified food can be categorised as a wholly anthropocentric activity. It manipulates the DNA of plants and animals in order to create new organisms which are considered to be beneficial to humankind, or

at least to some parts of humankind. It does so by an explicitly reductionist methodology, in which plants and animals are defined atomistically in terms of their genetic structure, and not as component of the ecosystem in which they participate. Thus in addition to being anthropocentric, it is in direct opposition to the tenets of ecocentrism. This raises obvious parallels with the two studies mentioned above. If, in terms of values, the only consensus among the population is one of ecocentrism, at this level it seems likely that most people are opposed to the enterprise. Furthermore, those experts who are involved in a myriad different ways of producing this food must either be acting against their values, must have values which are different from the population as a whole, or a combination of the two.

The fieldwork for this thesis was a series of interviews with individuals involved in the production of genetically modified food, ranging from employees of supermarkets, food manufacturers, grain importers, trade associations and biotechnology companies, government advisors, representatives of NGOs and civil servants. Every interviewee was of sufficient standing within their organisation that they could be considered to have a significant impact on the policy towards genetically modified food of that organisation. The difficulty of collecting such data was reflected in some interviewees having to be classified as non-respondents. A variety of factors conspired to make some respondents unable or unwilling to talk about their values, and limited their responses to their professional activities. However, a high proportion of interviewees gave sufficient information for conclusions to be drawn about their values, and for the relationship between those values and their professional work to be explored.

Aside from non-respondents, interviewees fell into three broad categories: those with ecocentric values who opposed GM food, those with ecocentric values who supported GM food, and those with anthropocentric values who supported GM food. A fourth category, for those with anthropocentric values who opposed GM food was, as expected, empty. Assigning interviewees to such crude categories based upon complex interactions between their value systems and professional activities will always be arbitrary and open to question. Interviewees were

classified as having ecocentric values if they made an unambiguous statement to that effect, even if they also made statements claiming anthropocentric values. This was done because it is possible to hold both anthropocentric and ecocentric values simultaneously: one can believe that non human species have an intrinsic value, but also value them for their aesthetic beauty. Indeed, it is probably impossible to have exclusively ecocentric values. Anthropocentrists were defined as those who explicitly reject ecocentrism, since it is possible to have only anthropocentric values.

Ascertaining interviewees' stances on GM food was sometimes straightforward, particularly among those who were against it, but most who could be considered in favour of it were unwilling to admit it, as their professional positions required them to project a neutral stance. For example, most supermarkets have an official policy of being 'open minded' about GM food, and being responsive to the demands of their customers. While their actual behaviour may differ from this, it is difficult for a representative of the company to present anything other than a neutral position. However, in the space of a lengthy interview, it is virtually impossible for an interviewee to conceal their own opinion, and thus rarely was it impossible to ascertain an interviewees stance.

The greater part of the interviews were spent exploring the connections or contradictions between values and professional actions in an attempt to reconstruct the narrative, if any, the interviewees used to rationalise their behaviour. Although interviewees were found with no fundamental conflict between their values and actions - for example a member of the organic movement whose ecocentric values have explicitly driven his professional activities, which included vehement opposition to GM food, and a government advisor whose anthropocentric Christianity had clear connections to his support for GM food, the interviewees central to the thesis were those who demonstrated a conflict between their values and their professional activities.

The interview material confirmed Boster, Kempton and Hartley's findings that ecocentric values are widely held, and unambiguously ecocentric statements were

regularly made by those whose professional activities conflict with those values. For most, this conflict was rationalised by the use of a quite limited range of narratives. The most popular was the need to increase food production to meet the demands of an increasing world population. This argument had the effect of allowing the utterer to portray their own values as having less importance than the moral imperative of feeding hungry people. This prioritisation allowed them to hold one set of values, while acting against them 'towards the greater good'. The argument was not used by those who also claimed expert knowledge of global hunger: those individuals tended to claim that GM food lacked the potential to feed the starving, would not be used in that way even if the potential existed, and that hunger was not caused by a lack of food, but by a lack of access to food. The use of ungrounded claims gave the argument the character of a moral life-raft, grasped for in desperation.

Many interviewees made a connection between GM food and more nebulous notions of 'progress'. Progress was portrayed as beneficial; commonly described as a process which had provided a comfortable lifestyle, and thus GM food, as a part of this process was also seen as being beneficial, or at worst, a small price to pay for the greater good. They described opponents of GM food as being against progress, and thus against the benefits it had bestowed. Opponents of GM food who talked about progress tended to use a more complex definition of the concept, not as something to be accepted or rejected, but as something to be negotiated. None were actually against science, as claimed by their opponents, but wanted to be able to accept or reject technologies as they felt was appropriate. Thus for conflictual respondents, one dimensional notions of progress provided a location for value/action contradictions to meet.

Some interviewees linked the notion of progress with feeding the hungry when talking about the Green Revolution in poor nations. The possible arrival of GM crops in these regions can be considered a continuation of this project, both being the application of western agricultural technology in non-western situations, and both being what interviewees often considered to be progress. It follows therefore that an individual's view of the likely benefits of GM crops in poor

regions is likely to be coloured by their view of the success of the Green Revolution.

The final popular way of resolving conflict was the argument that WTO rules make resisting the arrival of GM food impossible, allowing the utterer to dismiss notions that such an arrival may be undesirable as irrelevant, and thus not act upon any convictions he might have in that direction. For interviewees in favour of GM food, this argument was not generalised to include a critique of the free trading agenda which has led to the WTO's position, but articulated in isolation. In a sense this argument is even more attractive for a conflictual individual than those revolving around feeding the hungry. The latter involves the need to defend a moral position, an interpretation of the causes of world hunger, and the future trajectory of genetic modifications, in all its political and technical complexity. Users of hunger based arguments can be, and are easily attacked by their opponents, a fate more easily avoided by users of the WTO argument. The latter group need make no moral judgements, or even to defend the position of the WTO. They need only point towards the WTO's rules and its power, and shrug their shoulders. There is no need to argue, or even to disagree with critics of GM food, since the desirability of GM food is not part of their argument.

The common feature of all the popular arguments, which is absent from the unpopular ones considered is that in all cases the utterer, admittedly with varying degrees of success seeks to deny any kind of personal input to, and thus responsibility for the position they have taken. The WTO based argument presents the utterer as an impotent victim in the face of an all-powerful institution, whereas the hunger arguments (less successfully) present feeding hungry people as a moral imperative which over-rides all other moral considerations, including the (well fed) utterer's own.

Another feature of the way conflictual respondent used arguments to justify their value/action conflict was the crudeness of their responses when compared to those used by opponents of GM food. This appeared to be a result of a lack of knowledge, which precluded the grounding of statements in claims of fact or of

expertise. However it also occurred in individuals who appeared to have a broad understanding of the context of their work, which raises the suspicion that the argument was deliberately simplified in order to provide a resolution to the value/action conflict, as a kind of moral life-raft. However, it also reflects the GM project itself, driven as it tends to be from narrow specialisms, but resisted by those more concerned about context. One would expect therefore that those opposing GM food would have a more sophisticated grasp of the issues surrounding the technology than those in favour of it.

The thesis was based around the somewhat mechanistic prescriptions of Naess, which allow for the construction of an internally coherent worldview, which carries with it the implication that such a worldview is a desirable state of affairs, whereas a contradictory world view is not. However, Billig suggests that contradiction and argument is how people think, and so rather than being undesirable, is necessary and inevitable. According to this argument, the conflictual interviewees uncovered in this thesis are the result not of the inappropriateness of GM food, but of simply being human, and that any society would therefore produce conflictual individuals - indeed be populated exclusively by them. Thus the presentation in this thesis of non-conflictual respondents represents a failure of the researcher rather than a representation of reality. The interview material contains support for Billig's thesis in the contradictory nature of parts of the interviewees' utterances, but acceptance of its validity does not undermine the substance of the thesis. The interview material represents a mixture of argumentative repertoire, and the resolutions of those arguments. The interviewees could not have articulated all the conflicting ideas they considered before arriving at their conclusions

8.2 Limitations of the Research

The primary weaknesses of this project are, to a large extent, inherent in its methodology, which is in turn, inherent in the research topic. It is highly reliant on the behaviour of the researcher in selecting the interviewees, the way in which the interview was directed and the interviewee/interviewer rapport that evolved during the encounter, and in the way in which the material was interpreted after the event. It is undoubtedly true that a different writer would have interpreted the material collected differently, and a different researcher would have collected different data. In particular, I believe that the fieldwork would have been better undertaken by a female researcher. However, I present my interpretation as plausible, and supported by the evidence I have, while accepting that alternative interpretations are possible.

The environment in which research of this nature is inevitably carried out creates a multitude of difficulties, known and unknown which impact upon the results obtainable. The group of interviewees cannot be termed random or representative, so drawing inferences about 'experts' in general is problematic, and any kind of meaningful statistical analysis impossible. Despite this, and despite the spread of different interviewees, the results were remarkably coherent, which implies either that the interview material uncovered genuine, generalisable phenomena, or that I was able to direct and interpret the interviews according to a pre-determined agenda. I hope the interview excerpts reproduced here demonstrate that the latter effect, while undoubtedly present, does not invalidate the results. Furthermore, according to Firestone:

the most useful generalizations from qualitative studies are *analytic* not "sample-to-population"¹

¹ Firestone 1993, cited in Miles & Huberman 1994 p. 28

8.3 Uses for the Thesis

The issues which make this avenue of research difficult are also the source of its importance. It seems clear that a technological trajectory is unfolding, with which the general public are increasingly uneasy, and about which they are more ready than in the past to voice their disapproval. However, both industry and their regulators seem to have been taken by surprise at the reaction to GM food. While many issues are at play here, there appears to be a mis-match between the way GM food is handled through official channels, as a technical issue of risk evaluation, and the public who appear to hold values which conflict with the genetic modification of food, values which seem to some extent to be shared by the experts driving the process. Non inclusion of these values into the consideration of GM food will almost inevitably lead to decisions being taken which the majority find unacceptable. This study demonstrates that those values are not the rantings of an irrational public whipped up into a state of hysteria by the press, but are values shared by at least some involved in the process itself, and which have an identifiable philosophical foundation. The implication here is that the policy process would be improved if those involved were permitted and encouraged to explore how their environmental values link with their work. This is not to suggest that such an exercise would adequately replace public consultation on new technologies, but given that most technologies only become public issues when they become available to the public, at which time the option of rejection has, in many cases has already been removed, it could prevent some of the less acceptable technologies being pursued. However, there remains the problem outlined in Chapter One that ecocentric values are in direct conflict with the dominant social paradigm, and so to accommodate such values within institutions which operate according to that paradigm, and arguably operate to strengthen it, is problematic. Unfortunately, this leads to the possibility that research of this nature could lead to corporations and their supporters being able to introduce technology which conflicts with the apparent consensus of environmental values more effectively, by changing not its nature, but its portrayal. Monsanto, for example is already presenting its vision of the future of industrial agriculture as sustainable and environmentally friendly in an attempt to

neutralise criticism from the environmental movement, and it seems reasonable to suppose that it could use research of this nature to present its work as being compatible with the public's environmental values. However, the same would seem to apply to NGOs, who appear to have abandoned their philosophical base in order to engage their opponents on the latter's terms. This thesis suggests that they might strike a chord with the general public if they presented themselves more in this way. Certainly the interviewees from environmental NGOs did not consider values to be a part of their campaigning strategy.

This project was conceived out of an interest in the tension between ecocentrism as an ideology in contradiction to the dominant social paradigm, other non-ecocentric forms of environmentalism and industrialism in general. The thesis provides, as far as I have been able to ascertain, the first evidence that ecocentrism exists among those involved in technological innovation; previous studies concentrating on lay people. While previous studies, for example Boster Kempton and Hartley (1995) have explored how individuals construct narratives around their environmental values, and have included individuals who have been personally disadvantaged by environmentalism, this study considered individuals whose professional work, over which they have at least some degree of control, could be either for or against ecocentrism. Earlier studies have not sought such a powerful sense of agency in their interviewees, although of course as consumers, voters and citizens, agency is never entirely absent. By selecting individuals actively involved in shaping a powerfully anti-ecocentric technology, knowledge and agency were combined in a way absent in lay studies to provide an arena in which to explore the relationships between values and action, particularly when there appeared to be a contradiction between the two. For these individuals to retreat behind ignorance and impotence was much more difficult, which is reflected in the richness of the interview material. Thus this thesis provides an insight into the dynamics of an ideology which appears to be contrary to individuals' values, and yet is perpetuated by individuals, some of whom hold the same values. It also sheds light on the upsurge of public hostility to GM food in the two years following the interviews by locating it in opposition to commonly held values. For environmentalists, it is tempting to predict a future in which

environmentalism has succeeded industrialism, and this thesis suggests that new technologies forcibly introduced by large corporations through global trading systems could be the arena in which public hostility to industrialism becomes apparent. If such hostility is to emerge as a serious threat to industrialism in the next century through technology, it is likely to be the major emergent technology of genetic modification, although not necessarily of food which precipitates it. While this thesis does not consider the prospect of such a threat emerging, by exploring conflicts between ecocentric values and anthropocentric actions, often hidden by apparently fragile mechanisms, it does suggest areas in which such a threat could emerge through the exposure and resolution of such conflicts.

8.4 Prospects for Future Work

The interviews were conducted between January and June 1997, at a time when press coverage of GM food was minimal, and while it was clearly emerging as an important public issue, few interviewees seemed to be aware of how important it would subsequently become. The sensitivity of the issue even at that time made collecting data, particularly with individuals working in commercial organisations difficult; this category provided all the interviewees whose values were not uncovered. Subsequent developments have made it very unlikely that these individuals would now agree to be interviewed at all, and with the exception of those explicitly against GM food, it seems highly unlikely that the interviewees would be as candid now as they were then. For this reason, I do not believe it would be possible to replicate this study, at least using GM food as a case. In more general terms, GM food represents the latest in a series of events which have damaged the credibility of technological advances in the eyes of the general public, and I believe that as a result, researching how values and professional activity interact as new technologies are introduced will become more difficult as those involved perceive increasingly hostile public scrutiny.

The core of this thesis was the exploration of the narratives articulated by conflictual interviewees, but this was possible only after conducting a number of

interviews with individuals who did not fall into this category, partly because for some, there was no way to ascertain in advance which category they would fall into, but also to complement the theoretical part of the thesis which predicted the other two categories. Furthermore, much time was spent during the interviews exploring avenues which turned out not to be fruitful in locating the interviewees value/action conflict. Despite a vast quantity of interview data, for these reasons amongst others, very little of it was actually relevant to the core of the thesis. While the investigation of a framework for analysis was a necessary part of this project, it left, at times, a frustrating sense of superficiality caused by the lack of time it was possible to spend on what turned out to be the central themes of the thesis.

Two topics seem to lend themselves particularly to more detailed research, namely expert perceptions of food security and of notions of progress. While both were clearly identified as locations of conflict, hidden or otherwise, there was little opportunity to unpack why and how each individual had arrived at their position. Issues worthy of further exploration include which sources of information they had used and why they had used them, and why other sources had not been used. A similar methodology, of confronting interviewees with arguments they appear to disagree with to test both the robustness of their position, and the way in which it is constructed could be used. An opportunity is provided here by the clear pattern of interviewees in favour of GM food using arguments to reinforce their position, about which they appear to have comparatively little knowledge. It seems reasonable to suppose that a narrative structure composed of such arguments would disintegrate when confronted with opposing arguments, and it would be useful to record the manner of any such disintegration. Such a project would, however, leave the researcher open to accusations that she was not a researcher, but an activist seeking to impose their agenda on the interviewee. An accusation of this type occurred only once during the project, and was deflected by a brief explanation of the research methodology. This fieldwork, like most, relied on the co-operation of interviewees, who gave up their time willingly, and who, in the face of a much more confrontational interview, may withdraw their co-operation.

The comparison of arguments used by interviewees with authoritative expert positions is one used by Boster, Kempton and Hartley in their lay study to good effect. The author's own knowledge of topics such as food security in poor regions indicated that the material gathered would be suitable for such an analysis, and indeed when describing certain interviewees it was difficult not to include such comparisons. However, such an approach would have required a review of expert positions on a variety of topics, and was in any case beyond the scope of the thesis.

A third major theme worthy of further investigation were the arguments based around the impotence of the interviewee in the face of the power of the WTO and the structure of global trade. As a method for side-stepping confrontational debate, this is particularly effective, and would probably render the confrontational research method outlined above unworkable. However, there appears to be a societal consensus, at least in the developed world that free trade is beneficial; certainly this was shared by a number of interviewees. That the WTO and the structure of global trade are a result of free market policies seems to create a conflict for those who support free trade, but are uneasy with the prospect of the WTO forcing countries to accept GM food. In a sense, this conflict reflects the conflict this project attempts to investigate, because while being hostile to a free market agenda does not mean that an individual is ecocentrist, an ecocentrist will tend to favour radical decentralisation and local self-sufficiency, which is in direct opposition to the thrust of global trade policy. Thus an investigation of conflictual attitudes to free trade would make a useful compliment to this thesis.

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