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COMMISSIONING GENETIC MODIFICATION:  
the Marginalisation of Dissent in the Royal  
Commission on Genetic Modification

A thesis

submitted in partial fulfillment  
of the requirements for the Degree

of

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at the

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by

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# ABSTRACT

The Royal Commission on Genetic Modification (RCGM) appeared to be a 'public debate'. It sought the participation of people from a cross-section of society according to its broad terms of reference, and invited input on 'options' for the nation. The majority of the public and special interest groups voiced their opposition to Genetic Engineering (GE). Despite this, the Commissioners proposed that Aotearoa New Zealand proceed with GE with 'caution'. (The recommendations included recommencing GE field trials and planning for releases of genetically modified organisms.)

In this research I applied a multidimensional discourse analysis model to the RCGM to investigate if it was pre-determined in its findings. I analysed the social and historical context of the RCGM, its processes, and the consequential narratives in the texts produced by the environmentalists and the bioproponents who made submissions, and the documentation produced by the RCGM.

I found that Enlightenment rationality, shaped the context of the Commission and, was reflected in the processes for 'Interested Persons' (the interest groups). This made it difficult for groups to articulate objections to GE that were based on non-scientific, holistic and alternative worldviews. Furthermore, I found that the RCGM's findings reflected the contestation of science evident in the debate between the environmental groups and the bioproponents. The creation of a utopian 'sustainability' discourse by the environmentalists, and their construction of this vision into a tenet called the

precautionary principle, confronted the bioproponents' utopian vision of Progress guided by experts using neutral science. The bioproponents' response, to reject the precautionary principle and appropriate and redefine sustainability to mean sustaining Progress through GE, was mirrored in the RCGM's findings. Thus, modernist rationality shaped the processes of the RCGM, restricting public participation and articulation of opposition to GE, ultimately pre-determining the RCGM in favour of GE.

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# TABLE OF CONTENTS

<b>ABSTRACT</b> .....	<b>II</b>
<b>ACKNOWLEDGEMENTS</b> .....	<b>IV</b>
<b>TABLE OF CONTENTS</b> .....	<b>VII</b>
<b>LIST OF TABLES</b> .....	<b>X</b>
<b>LIST OF FIGURES</b> .....	<b>XI</b>
<b>LIST OF PHOTOGRAPHS</b> .....	<b>XII</b>
<b>LIST OF ABBREVIATIONS</b> .....	<b>XIII</b>
<b><i>PART 1: SETTING THE SCENE</i></b> .....	<b><i>1</i></b>
<b>1 INTRODUCTION:</b> .....	<b>2</b>
1.1 BACKGROUND TO THE GE DEBATE AND RCGM.....	4
1.2 BACKGROUND TO PUBLIC INQUIRIES.....	11
1.3 THE RCGM AS A ‘PUBLIC DEBATE’.....	14
1.4 GOAL, OBJECTIVES AND PURPOSES OF THE THESIS.....	15
<i>1.4.1 Thesis Organisation</i> .....	<i>17</i>
<b>2 THEORETICAL CONTEXT</b> .....	<b>23</b>
2.1 ONTOLOGY AND EPISTEMOLOGY.....	24
<i>2.1.1 Analysing the Royal Commission on Genetic Modification</i> .....	<i>26</i>
2.2 GEOGRAPHY.....	28
2.3 THE WORK OF ULRICH BECK.....	30
2.4 SCIENCE AND TECHNOLOGY STUDIES.....	35
2.5 (POLITICAL) ECOLOGY.....	36
<i>2.5.1 Ecofeminism</i> .....	<i>39</i>
<b>3 METHOD:</b> .....	<b>43</b>
3.1 BOUNDARY WORK.....	44
3.2 CRITICAL DISCOURSE ANALYSIS.....	47
<i>3.2.1 The Discourse Model</i> .....	<i>51</i>
<i>3.2.1.1 Multiple Texts: Triangulation and Crystallisation</i> .....	<i>54</i>
3.3 SITUATING MYSELF IN THE RESEARCH.....	56
<i>3.3.1 Third Space and Reflexivity</i> .....	<i>60</i>
<i>3.3.1.1 Advantages and Challenges of this Approach</i> .....	<i>63</i>
3.4 THE INTERVIEWS.....	66
3.5 THE GROUPS.....	72
3.6 DECONSTRUCTION IN ACTION.....	75

**PART 2: THE RCGM'S DISCOURSE.....80**

**PART 2 SUBSECTION 1: THE SOCIAL PRACTICE AND DISCURSIVE FIELD OF THE RCGM.....81**

<b>4 MODERNITY'S RATIONALE.....</b>	<b>82</b>
4.1 THE RISE OF RATIONALITY.....	83
4.1.1 Science.....	87
4.1.2 Rationality and Narratives.....	89
4.1.3 Scientification of Law.....	90
4.2 THE RCGM.....	91
4.2.1 Issues Related to 'Interested Persons'.....	94
4.2.1.1 Selection of Interested Persons.....	95
4.2.1.2 Difficulties for Interested Persons.....	98
4.2.1.3 The Submission Template for Interested Persons.....	101
4.2.1.4 Summarising Submissions.....	103
4.3 CONCLUSIONS.....	104
<b>5 CONTESTING MODERNITY.....</b>	<b>106</b>
5.1 CHALLENGING MODERNITY THROUGH ENVIRONMENTALISM?.....	107
5.1.1 Pre-Environmental Sentiments-Romanticism.....	107
5.1.2 Contemporary Environmentalism.....	108
5.1.2.1 Environmental Commitments.....	112
5.1.3 Environmental Groups and Modernist Science.....	121
5.2 DOMINANT CONTEMPORARY ENVIRONMENTAL SPEAK-ECOLOGICAL MODERNISATION.....	127

**PART 2 SUBSECTION 2: THE TEXTS OF THE RCGM.....129**

<b>6 THE HEGEMONIC TROPES.....</b>	<b>130</b>
6.1 AUTONOMOUS SCIENCE IS PROGRESS.....	130
6.2 SCIENCE IS NEUTRAL.....	137
6.3 TRUST US WE ARE THE SCIENTISTS (EXPERTS).....	140
6.3.1 <i>They Just do not Understand Science . . . They are Misguided</i> .....	140
6.3.2 <i>What is this Ethics/Culture Thing? . . . We have Science</i> .....	145
<b>7 (EN)COUNTERING HEGEMONIC TROPES.....</b>	<b>149</b>
7.1 USING SCIENCE.....	150
7.1.1 <i>Challenging Science</i> .....	152
7.1.2 <i>We are not Anti-Science</i> .....	155
7.1.2.1 <i>Science is not Neutral—it is (a Slave to) Big Business</i> .....	156
7.1.3 <i>Scientists are Not Experts on GE as Science is Just One Knowledge System</i> .....	158
7.2 SUSTAINABILITY.....	160
7.2.1 <i>The Life of the Sustainability (Grand) Narrative</i> .....	161
7.2.2 <i>Challenging Progress with Sustainability</i> .....	164
7.3 PROPOSING THE PRECAUTIONARY PRINCIPLE.....	169
7.3.1 <i>The Precautionary Principle or Approach</i> .....	170
7.3.2 <i>What Precaution Would Mean</i> .....	171

<b>8 MEETING THE CHALLENGE.....</b>	<b>179</b>
8.1 SUSTAINABILITY .....	181
8.1.1 <i>GE is Sustainable Agriculture</i> .....	182
8.1.1.1 <i>Organic Genetic Engineering</i> .....	184
8.1.2 <i>Beyond Agriculture</i> .....	185
8.1.3 <i>Progressing Sustainability or Sustaining Progress?</i> .....	186
8.2 CONTESTING THE PRECAUTIONARY PRINCIPLE.....	187
8.2.1 <i>Multiple Meanings?</i> .....	187
8.2.2 <i>No Uncertainty and No Need for Precaution</i> .....	191
8.2.3 <i>Rethinking the Precautionary Principle</i> .....	195
8.2.4 <i>Debating Strong and Weak Precaution</i> .....	196

## **PART THREE: BRINGING IT ALL TOGETHER.....200**

<b>9 WRAPPING UP THE RCGM AND MOVING BEYOND.....</b>	<b>201</b>
9.1 DECONSTRUCTING THE COMMISSIONERS' FINDINGS.....	201
9.1.1 <i>The RCGM's Sustainability Trope</i> .....	202
9.1.2 <i>The RCGM's Precautionary Principle Trope</i> .....	204
9.2 POST-RCGM.....	207
9.3 ENVIRONMENTAL GROUPS.....	208
9.4 GOVERNMENT.....	212
<b>10 CONCLUSIONS.....</b>	<b>217</b>
10.1 DECONSTRUCTING THE DISCOURSE OF THE RCGM.....	218
10.2 RESEARCH APPROACH.....	220
10.3 AREAS FOR FURTHER RESEARCH.....	223
REFERENCES.....	227
APPENDICES.....	247

# LIST OF TABLES

	<b>Page</b>
<b>Table 3.1:</b>	Interviewees.....67
<b>Table 3.2:</b>	The Groups.....73
<b>Table 3.3:</b>	Initial Narrative Themes.....76
<b>Table 4.1:</b>	Selected Common Dualisms.....86
<b>Table 5.1:</b>	New Environmental and Dominant Social Paradigms.....113
<b>Table 5.2:</b>	Conventional and Alternative Agricultural Paradigms.....116
<b>Table 5.3:</b>	Environmentalisms.....121
<b>Table 9.1:</b>	Comparative Texts of the New Zealand Life Science Network and the Royal Commission on Genetic Modification.....206

# LIST OF FIGURES

	<b>Page</b>
<b>Figure 1.1:</b> Thesis Organisation.....	18
<b>Figure 3.1:</b> Fairclough's (1992a) Three-dimensional Conception of Discourse.....	52
<b>Figure 3.2:</b> Application of Fairclough's (1992a) Model to the RCGM Discourse.....	54
<b>Figure 3.3:</b> Timeline.....	57
<b>Figure 3.4:</b> The Tropes.....	78
<b>Figure Part 2.1:</b> The Symbol of the RCGM.....	80
<b>Figure 5.1:</b> The DSP and NEP Model Showing Environmental Sentiments.....	115
<b>Figure 5.2:</b> Changes to the Environmental Movement Since 1970.....	118
<b>Figure Part 3.1:</b> Envisioning.....	200

# LIST OF PHOTOGRAPHS

	<b>Page</b>
<b>Photo 1.1:</b> 'Massive GE Free Rally Shows Opposition Still Strong' .....	1

## LIST OF ABBREVIATIONS

AAP	Alternative agricultural paradigm
ANZFA	Australia New Zealand Food Authority
BSE	Bovine Spongiform Encephalopathy
CAP	Conventional agricultural paradigm
CJD	Creutzfeldt-Jakob Disease
CRI	Crown Research Institute
DNA	Deoxyribonucleic acid
DSP	Dominant social paradigm
ECO	Environment Conservation Organisations of New Zealand
ERMA	Environmental Risk Management Authority
EU	European Union
GE	Genetic engineering
GEO	Genetically engineered organisms
GM	Genetic modification
GMO	Genetically modified organism
IP	Interested Persons
NEP	New environmental paradigm
NGO	Non-governmental organisation
NZLSN	New Zealand Life Sciences Network
PP	Precautionary principle
PR	Public relations
PUS	Public understanding of science
RCGM	Royal Commission on Genetic Modification
STS	Science and technology studies
The Greens	The Green Party of Aotearoa New Zealand
UEA	University of East Anglia
UK	United Kingdom
U.S.A	United States of America
UN	United Nations

## PART 1: SETTING THE SCENE

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**Photo 1:** 'Massive GE Free Rally Shows Opposition Still Strong'.  
Source: Greenpeace New Zealand (2003).

Ten thousand people marched down Queen St. Auckland on 16 November 2002 to display their objection to GE (Greenpeace New Zealand, 2003).

*[B]ecause of the strong public opposition [to genetic engineering] . . . the [Royal] Commission [on Genetic Modification] is very unlikely to come up with a policy that says 'go for it'.*

Greenpeace New Zealand's Genetic Engineering Campaigner Annette Cotter, Interview 2001.

## 1

INTRODUCTION

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*[W]e just couldn't see how they [the Royal Commissioners on Genetic Modification] could come to those conclusions on the basis of what they heard* (Green Party of Aotearoa New Zealand Co-leader Jeanette Fitzsimons, Newstel, 2001).

The New Zealand government's Royal Commission on Genetic Modification (RCGM) was one of a small number of Commissions of inquiry into genetic engineering (GE)<sup>1</sup> in the world.<sup>2</sup> It involved submissions from the public, Māori<sup>3</sup> and special interest groups. While a vocal minority, representing the biotechnology<sup>4</sup> industry, pushed for relaxing existing regulations on genetic engineering (GE) and promoted the benefits of

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<sup>1</sup>. I use genetic engineering (GE) to mean the alteration of genes or genetic material in vitro. More specifically genetic engineering is the 'manipulation of DNA [deoxyribonucleic acid] using restriction enzymes which can split the DNA molecule and then rejoin it to form a hybrid molecule . . . The technique allows the by-passing of all the biological restraints to genetic exchange and mixing, and may even permit the combination of genes from widely different species' (Allaby cited in Oxford Reference Online, 2003).

I have chosen to use the term instead of genetic modification (GM) for two reasons. Firstly, GE is more commonly used in Aotearoa New Zealand than GM—unlike a number of countries such as England. Secondly, GM has been intentionally used by industry and their public relations companies to invoke less consumer resistance, as 'genetic modification' is seen as more 'natural' sounding than 'genetic engineering' (see Levidow & Tait, 1995).

<sup>2</sup>. Although not a Royal Commission on GE as such, Germany held an Enquete-Kommission (Inquiry Commission) into GE between 1984 -1986. Britain's Royal Commission on Environmental Pollution investigated GMOs, and produced a report, *The Release of Genetically Engineered Organisms to the Environment*, in 1989 (Gottweis, 1998). The United Kingdom (UK) also currently have an Agriculture and Environmental Biotechnology Commission which recommended the GM Nation? public debate (see Agriculture and Environmental Biotechnology Commission, 2003).

<sup>3</sup>. Māori are the indigenous peoples of Aotearoa New Zealand.

<sup>4</sup>. Biotechnology describes the larger group of technologies of which GE is a subgroup. More specifically it is the '[d]evelopment of products by exploiting biological processes or substances. Production may be carried out by using intact original or modified organisms, such as yeast and bacteria, or by using active cell components such as enzymes from organisms' (Shiva cited in Hindmarsh & Lawrence, 2001, p.216).

a GE future for Aotearoa New Zealand<sup>5</sup>; some 9,998 (92%) of the 10,861 public submissions were either strongly against, or tending to be against GE (Royal Commission on Genetic Modification, 2001a). In addition the overwhelming majority of submissions made by Māori at hui (meetings) voiced concerns about GE, while the environmental groups and vast numbers of other social movement groups argued against the adoption of genetic engineering. Despite this, the RCGM's findings, which were released on 30 July 2001 in a four-volume 1200 page report, can be summarised as 'proceed with GE with care' (Royal Commission on Genetic Modification, 2001a). The recommendations included recommencing GE field trials<sup>6</sup> and planning for releases<sup>7</sup> of genetically modified organisms (GMOs)<sup>8</sup>. (Royal Commission on Genetic Modification, 2001a)<sup>9</sup>.

In response to the publics'<sup>10</sup> expressions against GE the Commissioners clearly stated their intent to ignore them: 'We wish to stress ... that the terms of reference did not direct us to conduct our inquiry as if it were a referendum.' (Royal Commission on Genetic Modification, 2001a, p.7). This is not to say that everyone was surprised with the RCGM's findings. Some proponents of biotechnology such as Brian Arnst, the

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<sup>5</sup>. 'Aotearoa' is the Māori word for New Zealand which I have used in addition to 'New Zealand' to highlight the struggles of the indigenous peoples. In particular I have used it to acknowledge the partnership inherent in the tiriti o Waitangi (Māori version of the Treaty of Waitangi) and to encourage the popular usage of the Māori language.

<sup>6</sup>. A field trial is the development of a GMO in the conditions it would be 'released' in, but with protections claimed to ensure genetic pollution or propagation cannot take place. Approval for field trials is gained by the Environmental Risk Management Authority (ERMA). (For further details see Environmental Risk Management Authority, 2003).

<sup>7</sup>. A release of a genetically modified organism (GMO) (see footnote 8) is the approval of a GMO for development and sale in any part of the country (Environmental Risk Management Authority, 1999a).

<sup>8</sup>. A GMO is any plant, animal or micro organism that has been genetically engineered (Environmental Risk Management Authority, 1999b).

<sup>9</sup>. During the time of the RCGM a moratorium was in place in which no new approvals of field trials were given (although there were exceptions) and approvals for releases of GMOs were not considered.

<sup>10</sup>. Throughout this thesis the plural to 'the public', 'the publics', is referred to in order to highlight the diversity of public opinion rather than give the impression of a homogeneous public (see Irwin, 2001).

Public Relations Manager for Monsanto New Zealand, suggested that the findings were as he expected (Email Interview, 2001).

The findings did, however, leave me, and others, questioning how the Commissioners did indeed come to those conclusions on the basis of what they heard. Was in fact the outcome of the Royal Commission pre-determined? This doctoral thesis engages with these questions by deconstructing the ‘discourse’<sup>11</sup> of the Royal Commission on Genetic Modification. It will be useful to begin this process by setting the scene of the RCGM, with a description of the background to the GE debate, in Aotearoa New Zealand and globally, situating the RCGM within a context of public inquiries, and describing the RCGM’s terms of reference, before outlining the goal, objectives, purposes and organisation of the thesis.

## **1.1 Background to the GE Debate and RCGM**

Aotearoa New Zealand could be considered a latecomer to the GE debate and GE regulation. Environmentalists in Aotearoa New Zealand began speaking out about GE in the 1990s (Mary-Ann Howard-Clark, Interview, 2001), while the organisation that

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<sup>11</sup>. Discourse(s) is a term with multiple, yet interrelated, meanings. It refers to Fairclough’s (1992) three dimensional discourse model utilised in this thesis (See section 1.4 this Chapter and Chapter Three). ‘Discourses are [also] the general context in which ideas take on a specific meaning and inform particular practices’ (Benton. & Short, 1999, p.1). In this sense it can refer to ‘. . . whole sets of ideas, words, concepts, and practices’ (Benton. & Short, 1999, p.1). Discourse(s) also refers to the themes found in text, and the groupings of these themes. In order to reduce the number of uses of the word discourse(s) in this thesis I will be implying the first two definitions when I refer to discourse(s), will refer to text themes as narratives, and the groupings of these themes as tropes (see Chapter Three). The meaning of each use of the word ‘discourse(s)’ will be apparent within its context.

regulates GE under the Hazardous Substances and New Organisms (HSNO) Act of 1996, the Environmental Risk Management Authority (ERMA), only came into effect in 1998. Previous to this there was only a voluntary notification arrangement regarding the importation or use of GMOs through the Interim Assessment Group (Environmental Risk Management Authority, 1999a).

The lateness of attention to GE in Aotearoa New Zealand contrasts with the international attention that resulted from the 1975 meeting of scientists convened by the US National Academy of Science in Asilomar, California. The meeting, which was chaired by Paul Berg, issued a warning often referred to as the 'Berg letter' on the risks of GE, calling for a voluntary moratorium until an international conference was undertaken to examine the issues (Nelkin, 1995; Schenkelaars, 1996). Piet Schenkelaars.<sup>12</sup> (1996) suggests that this was the event that drew GE into the public domain and spurred governments to start drawing up measures to regulate it.

Sheldon Krimsky and Alonzo Plough (1988) describe the early history of the GE debate in the world center of GE industry, the United States of America (U.S.A.). In the 1970s in the public arena there were 'symbols of mutant organisms going amok in scientific laboratories' (p.76), with the first public discussion on releasing GMOs into the environment occurring around 1980.

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<sup>12</sup>. I have chosen to use authors' first names when I first cite their work and use only their surnames on subsequent citations. I have done this as part of my attempt to overcome the tradition of distanced disembodied knowledge in accordance with my 'situated' approach (see Chapter Three).

Debate about GE was also occurring closer to Aotearoa New Zealand, with it being discussed in Australia. In my<sup>13</sup> collaborative work with Melissa Risely and Richard Hindmarsh (Rogers-Hayden, Risely & Hindmarsh, 2002), it is argued that the debate there moved out from the scientific communities into the public arena when the Australian Conservation Foundation called for a moratorium on GE in the 1980s. However, scientists had been discussing the possibility of GE since 1968, five years before the actual development of GE techniques.

The significance of the lateness of regulation and debate on GE in Aotearoa New Zealand is important for two reasons: people need time to assimilate complex issues such as those surrounding GE (see Krimsky & Plough, 1988) and GE ingredients had found their way into foods in Aotearoa New Zealand prior to regulation here.

Leading up to the RCGM it became publicly known that approximately 60% of all processed foods purchased in Aotearoa New Zealand already contained GE ingredients (Ministry of Health, 2000). However, at this time there had not been any releases of genetically modified organisms (GMOs) into the environment in Aotearoa New Zealand.<sup>14</sup> Given that Aotearoa New Zealand is geographically isolated and therefore unlikely to have GE pollen drift from other nations, the country's GMO options appeared to be relatively open at the time of the RCGM.

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<sup>13</sup> Some of the material I have written in this thesis appears in a number of publications. A list of these at the time of writing the thesis is attached as Appendix 1.

<sup>14</sup> However, an 'accidental' GMO release is believed to have occurred during the time of the RCGM. It is claimed that GE contaminated sweetcorn seed was imported, planted and harvested for consumption despite being contrary to New Zealand law. This is known as the 'corngate scandal' as the government on learning of the suggested contaminated seed took the matter out of the hands of ERMA and kept the information from the RCGM and the public (see Hager, 2002). An independent inquiry was undertaken to investigate the government's handling of the issue. The reviewer, Professor Don McGregor, made several recommendations including clarifying the roles of Ministry of Agriculture and Fisheries (MAF) and ERMA regarding their duties in relation to GMOs (see McGregor, 2002).

The lateness of Aotearoa New Zealand's debate and development of regulations on GE has been countered by the intensity of the controversy surrounding it. Large-scale public mobilisation occurred regarding GE in a similar way to that which had taken place against nuclear technology before Aotearoa New Zealand was declared a nuclear-free zone (see Clements, 1988). A very different political climate had, however, surrounded the establishment of the nuclear-free zone in the early 1980s. The nuclear-free debate in Aotearoa New Zealand occurred during a period in which the nation was socio-economically 'restructured' and pushed towards a more free-market economy, a process which included large scale selling of public assets (see Kelsey, 1997; also Le Heron & Pawson, 1996). Becoming nuclear-free therefore acted to distract the public from the radical social and economic restructuring. This restructuring led to the commercialisation of government science which affected GE.

Some members of the public reacted in a similar way, in their expression of their desire for Aotearoa New Zealand to become GE-free, to the previous demands in the 1980s to becoming a nuclear-free, with non-violent protests and declaration of 'GE-free zones' throughout the country (see Genus & Rogers-Hayden, *forthcoming*). Before being nuclear-free became a national policy, most areas of the country had symbolically been declared nuclear-free zones by their local councils (see Clements, 1988). With the GE-free campaign the GE-free zones ranged from districts, such as Waiheke Island,<sup>15</sup> to people registering their homes and properties on-line as private GE-free zones.<sup>16</sup> (GE-Free Register, 2003).

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<sup>15</sup>. An island off the coast of Auckland, in the North Island. Waiheke Island has a resident population of just over 7000 people (7137 at the 2001 census, see Statistics New Zealand, 2003), but the population swells to 30 000 people during the summer holiday season (Luxury Adventure, 2003).

<sup>16</sup>. Available at: <http://www.gefreeregister.co.nz/>

Specific non-governmental organisations (NGOs) were created to organise resistance against GE in Aotearoa New Zealand. GE-Free New Zealand, an umbrella group, emerged from the Nelson<sup>17</sup>. Environment Centre to concentrate solely on GE issues, receiving funding donations from other major environmental groups that were not prioritising the concern. The established environmental groups did, however, give it greater attention later. Greenpeace New Zealand, for example, developed a staff position dedicated to addressing GE (Mary-Ann Howard-Clark, Interview 2001).

Repeated public opinion polls during the late 1990s found that the publics were eating GE food without knowing, as the majority revealed that they would not eat GE food if it were labelled as such.<sup>18</sup> This led to a campaign by Greenpeace New Zealand in which it produced the 'True Food Guide'—a publication listing the GE status of many foods available in Aotearoa New Zealand. Products were listed in red, amber, or green sections, in accordance with the colour of traffic lights (see Greenpeace New Zealand, 2002). Those in the red sections were produced by companies that had no clear policy on removing GE ingredients from their products or did not respond adequately to inquiries, those in the amber sections were from companies in the process of removing GE ingredients from their products, while those in the green sections produced GE-free products. The profile created by the Greenpeace New Zealand booklets led to many companies inquiring how to be moved out of the red zones, and a number changed to GE-free suppliers to facilitate this happening (Annette Cotter, Interview 2001).

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<sup>17</sup>. Nelson is located in the north of the South Island of Aotearoa New Zealand.

<sup>18</sup>. See for example, Genetically Altered Foods Frighten Most Shoppers, 1999. For a review of these public opinion polls see Campbell, Fitzgerald, Saunders and Sivak (2000).

It was not, however, only the environmental groups that were actively attempting to mobilise opinion. Kay Weaver and Judy Motion (2002) detail how government and industry were also actively trying to create support for GE. One outcome of governmental restructuring policies was that government research facilities were transformed into Crown Research Institutes (CRIs) and expected to operate as commercial entities. Some of these CRIs were undertaking GE experiments and became dependent on private user-pays funding. These CRIs consequently hired the public relations (PR) company 'Communication Trumps' to help create a favourable public environment for GE. It then formed a trust and created the organisation 'Gene pool' to 'educate' the public on all matters related to GE. The 'impartial' education was run by the PR company and funded in main by Monsanto. This became public knowledge when the Green Party of Aotearoa New Zealand (the Greens) leaked a draft PR document detailing how to publicly handle the unusually large lumpy heads of the genetically engineered fish from the King Salmon<sup>19</sup> fish growing experiments. In the media attention that followed it became apparent that Communication Trumps was undertaking PR on behalf of a number of organisations involved in GE and was running 'Gene pool'. As Weaver and Motion (2002) highlight, the efforts of this PR company to subvert democratic decision-making on GE actually helped open up the public debate on GE.

With GE being openly debated, active groups attempting to mobilise the public, and vocal public renouncing GE, genetic engineering became a 'hot' issue in the 1999 national elections. The subsequent establishment of the RCGM could be seen as a

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<sup>19</sup>. King Salmon is a fish farming company (see The New Zealand King Salmon Company Ltd., 1998).

victory for environmentalists as New Zealand's environmental political party, the Greens, had made their demand for a Commission into GE a campaign issue. This request was realised when the general elections ushered in a change in government, with the center-right National Party-led government being replaced with a Labour Party.<sup>20</sup>-led coalition. Even with its smaller coalition partner, the more traditional social democratic Alliance Party, the government was not able to form a majority government and could therefore easily be destabilised. This gave the balance of power to the Greens. Although not part of the government, the Greens promised not to threaten it by supporting votes of no confidence against it. The new Labour/Alliance government announced that it was establishing a Royal Commission into GE, with the RCGM to begin on 8 May 2000.

Three points can be identified as significant in the announcement of a Commission into GE. Firstly, Commissions are the public expression of a conflict in which all concerned can voice their perspective. The importance of this is described by Brian Wynne (1982):

*It [a Commission of inquiry] is a rare point of contact between local people, national pressure groups, policy makers, and industrial developers. Almost by historical accident, it has become the sole formal setting for public conflict about such developments (p.52).*

Secondly, the RCGM was a Royal Commission, which is the highest-level governmental inquiry possible in Aotearoa New Zealand. It involves a team of independent professionals, including a judge, undertaking a comprehensive

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<sup>20</sup>. While often identified as being a center left party, Labour expressed keen support for its predecessor's neoliberal economic policies. In fact, in an apparent paradox, Labour had been the instigator of these structural adjustment policies in its 1984-90 term in power. I do not, however, mean to imply that the successive Labour Parties since then have continued in quite this manner.

investigation into an issue. The findings of Royal Commissions provide non-legally binding recommendations to the government. The four Commissioners appointed to the RCGM, by the government, were the Right Honourable Sir Thomas Eichelbaum (Chief Justice of New Zealand from 1989 to 1999), Dr Jean Fleming (a molecular reproduction and endocrinology researcher), Dr Jacqueline Allen (a general practitioner in south Auckland with community and Māori health expertise), and the Right Reverend Richard Randerson (Bishop of the Anglican Church) (Royal Commission on Genetic Modification, 2001b). Finally, an important aspect of the background to the RCGM is that the inadequacies of public inquiries are ‘widely noted’ (Wynne, 1982), and it is to this point I will now turn.

## **1.2 Background to Public Inquiries**

Of particular interest to this investigation of the RCGM is that official inquiries have repeatedly been critiqued for their role in creating obstacles to public participation. They have, therefore, not acted as effective conduits to public debate on issues. Edward Schiappa (1989) describes ‘public debate as ensuing when an argument reaches beyond the boundaries of a specialized community or groups of private individuals and engages a larger group of people known as ‘the public’’ (p.46).

Official governmental inquiries have been criticised as performing merely a rhetorical function, providing legally non-binding advice as they give the public perception of review and control while they in effect postpone governmental action (Burton &

Carlen, 1979). It has been suggested that inquiries have at times been carried out to subdue powerful pressure groups when there is the possibility that these groups may threaten the continuation of state condoned activities (Doyle & McEachern, 2001). As such, they have been used to portray continued opposition to an issue as unreasonable (Doyle & McEachern, 2001). It has also been argued that official inquiries have been employed as a way of addressing a multifaceted issue when a bureaucracy's resources are stretched and to maximise opportunities for a specific group of stakeholders (Ashforth, 1990). Moreover, in several of the overseas inquiries into genetic engineering the debates have been structured in ways that create obstacles to broad participation by constraining input and objections. Thus, critiques have focused on the (re)production of dominant power/knowledge systems through the structure of inquiries.

An example of debate restriction occurred in the Australian Federal Government's House of Representatives 1992 inquiry on GE. Objections to GE were marginalised through the inquiry's terms of reference, which were established on the acceptance of the so-called benefits of GE. As a result of the foundations provided by the terms of reference a significant proportion of submissions, which were against GE and outlined the costs, were not reported when the inquiry's findings were tabled in parliament (see Hindmarsh, 1994; also Rogers-Hayden & Hindmarsh, 2002).

A more subtle, but equally limiting restriction of debate, occurred with Britain's Ministerial Advisory Committee on Release to the Environment (ACRE). According to the terms of reference of the ACRE the debate about GE was limited to the physical

risks of releasing GMOs into the environment (Grove-White, 1996). Discussions were confined to scientific assessments, effectively silencing all other discourses, such as those of an ethical, spiritual or cultural nature. The general effect of such debate restriction is to skew the discussion in favour of the bioproponents. This is because the bioproponents often present scientific evidence as value-free and separate from other considerations, while environmentalists are disadvantaged by an exclusive scientific discourse as their arguments are often much broader.

Although environmental groups often rely on science<sup>21</sup> to convey their concerns, they frequently have misgivings about a concentration on science. Relying on scientific arguments to fight an environmental battle often means a lack of attention is paid to the way social and cultural values are part of the debate, shifting public attention away from the human related activities that embody the environmental crisis (Grove-White & Szerszynski; 1992 Yearley, 1992). Environmental problems become framed as ‘objective’ problems, best addressed by ‘rational’ or ‘sound’ science, elevating science, scientific method and scientific expertise to a position of authority (this point will be elaborated upon in Chapter Four).

Replacing the possibility of a variety of arguments with the official, in this case scientific, argument is referred to as ‘debate rationalisation’. This is a frequent tactic of governments that are happy framing debates in ‘neutral’ terms (see Grove-White, 1993; also Hindmarsh, 2001). Commissions play a central role in this by transforming

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<sup>21</sup>. I refer to the singular ‘science’ rather than the plural ‘the sciences’ throughout this thesis. I am aware that there are multiple sciences, however I have chosen to use the singular as I often refer to both the philosophies and practices of science when I refer to ‘science’. The meaning of each use of the word ‘science’ will be apparent within its context.

political struggle into a rational and scientific administrative discourse '*par excellence*' (Burton & Carlen, 1979, p.3; see also Ashforth, 1990). Commissions have thus been critiqued for their role in upholding dominant power relations. In this way inquiries act to depoliticise issues by framing them as acts of discovery rather than issues of social choice (Wynne, 1982). Frank Burton and Pat Carlen (1979) have gone as far as to say that inquiries' documents 'are seen as representing a system of intellectual collusion whereby selected, frequently judicial, intelligentsia transmit forms of knowledge into political practices' (p.7; see also Chapter Four).

### **1.3 The RCGM as a 'Public Debate'**

Against this backdrop the RCGM provides an appropriate case-study. Although it was called for by environmentalists, these same environmentalists could not understand how the Commissioners eventually came to their findings. More specifically, unlike the inquiries described above, questions about the RCGM findings remain, despite processes inviting input from a broad cross-section of society and its terms of reference calling for discussion of 'options'.

The Commission, which sat for just over a year from May 2000 until 27 July 2001, was required to

*receive representations upon, inquire into, investigate, and report upon the following matters:*

- 1. the strategic options available to enable New Zealand to address, now and in the future, genetic modification, genetically modified organisms, and products; and*

2. *any changes considered desirable to the current legislative, regulatory, policy, or institutional arrangements for addressing, in New Zealand, genetic modification, genetically modified organisms, and products* (Royal Commission on Genetic Modification, 2001c).

These terms of reference were established by a working party<sup>22</sup> under the authority of the Minister for the Environment who was the Minister in charge of the RCGM (Royal Commission on Genetic Modification, 2001d). The RCGM therefore gave the appearance of being an open forum for public debate.

## 1.4 Goal, Objectives and Purposes of the Thesis

So what happened in the Royal Commission process? Did the processes of the RCGM facilitate open and equitable ‘public debate’, or did the very processes of the RCGM disadvantage those attempting to voice concerns about GE? A way of approaching such an issue is to investigate the relationship between language, power and knowledge through discourse analysis.

This has led me to ask the **research question**: did the ‘discourse’ of the Royal Commission on Genetic Modification pre-determine its findings?

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<sup>22</sup> Members of the working party ‘included officials from the Department of the Prime Minister and Cabinet, Ministry of Research, Science and Technology, Ministry of Health, Treasury, Department of Conservation, Ministry of Fisheries, Te Puni Kokiri (Ministry of Māori Development), Environmental Risk Management Authority, Ministry of Foreign Affairs and Trade, State Services Commission, Ministry of Agriculture and Forestry and DIA [Department of Internal Affairs]’ (Royal Commission on Genetic Modification, 2001d, p.104).

The **aim** of this thesis is therefore: to deconstruct the ‘discourse’ of the Royal Commission on Genetic Modification to analyse what effect this had on its findings.

To do this I consider it useful to view the RCGM as constitutive of the three elements of discourse described by Norman Fairclough (1992a). These are the social and historical context, the discursive field (production and consumption of text) and the elements of text (see Chapter Three).

The **objectives** of the thesis are:

- To analyse the social and historical context of the RCGM and the effect of this on the RCGM’s discursive field;
- To analyse the discursive field of the RCGM and the effect of this on the bioproponents’ and environmentalists’ tropes and the RCGM report; and
- To analyse the text of the RCGM discourse and the effect of this on the findings of the RCGM.

The research has been undertaken with three **main purposes** in mind. **Firstly**, through analysing the RCGM, the study aims to contribute to the body of scholarship on the relationship between language, knowledge and power in the social philosophies.<sup>23</sup> In particular, it seeks to contribute to understandings of the effect these relationships can have on public inquiries and their outcomes.

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<sup>23</sup>. I have chosen to call what are commonly termed the ‘social sciences’ the ‘social philosophies’ to highlight the philosophical as opposed to scientific nature of these investigations.

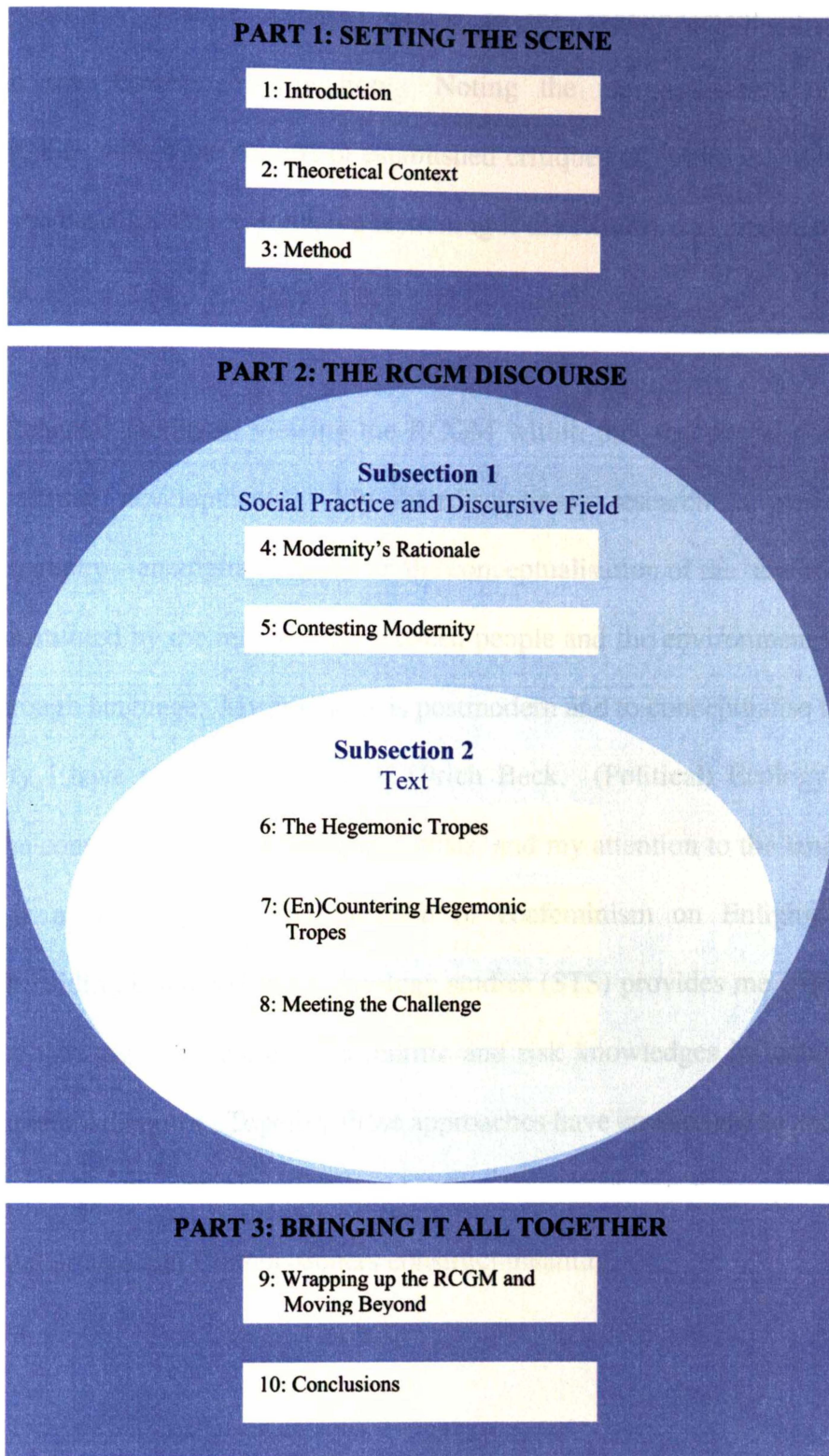
**Secondly**, it aims provide an investigation of the RCGM that will help elucidate, for environmental groups and other social movement organisations, what some of the influences were that led to the Commissioners coming to the conclusions they did. This is to aid environmentalists not only in their understanding of the RCGM, but to provide them with some theoretical understandings to practically inform their dealings with this (GE) and other public controversies, especially those that may go to a public inquiry.

**Thirdly**, it seeks to produce an analysis of the RCGM that will be of assistance to government by highlighting issues of concern in the RCGM, and by providing insights for the construction of more inclusive public participation in inquiries.

### **1.4.1 Thesis Organisation**

This investigation has led to a thesis of ten chapters, which I have organised into three parts. Part One establishes the background to the research, Part Two deconstructs the discourse of the RCGM in the model described above, and Part Three ties the research together (see Figure 1.1).

**Part One**, Chapters One to Three, involves ‘Setting the Scene’ for the research. In this current chapter I have established the context of the RCGM and its problematisation. I have noted the opposition to GE in Aotearoa New Zealand, an environment in which those supportive and critical of GE have attempted to mobilise the publics’ judgments.



**Figure 1.1: Thesis Organisation**

I have also outlined the governmental context of delayed discussion and legislation on GE in a politically volatile climate—leading to the announcement of a Royal Commission into Genetic Modification. Noting the marginalisation of public opposition to GE, within the context of established critiques of public inquiries, I have established the basis for this research—questioning if the RCGM was predetermined in favour of GE.

The second chapter facilitates viewing the RCGM within the ‘theoretical context’ of relevant academic developments. My interdisciplinary research is presented in (human) geography—an approach based on the conceptualisation of the ‘environmental crisis’ as constituted by the relationship between people and the environment which is traceable through language. My emphasis is postmodern and to conceptualise the crisis of modernity I have utilised the work of Ulrich Beck. (Political) Ecology aids in analysing the construction of environmental crisis, and my attention to the language of modernity is assisted by the concentration of ecofeminism on Enlightenment<sup>24</sup>. dualisms. In addition, science and technology studies (STS) provides me with helpful new insights into the construction of scientific and risk knowledges in technological and environmental disputes. Together these approaches have enabled me to analyse the time-and-place specific discourse of the RCGM, in which the bioproponents, the environmental groups and Commissioners construct meaning.

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<sup>24</sup>. I have capitalised ‘Enlightenment’, to separate this use from the common usage of the term, in order to highlight that I am referring to ideas in keeping with the Enlightenment project. I do not mean an organised project by this term but rather a cluster of assumptions (see McLennan, 1992; also Chapter Four).

The final element of the first part of the thesis, Chapter Three, outlines the ‘Method’ used to undertake the research. In this chapter I discuss the approaches I have taken in selecting and handling the data, and reflections upon the research processes. I outline ‘boundary work’ and critical discourse analysis, which together enable me to analyse the negotiation of the boundaries of ‘science’ in the discourse. It is through this deconstruction of language that I analyse power relations in the RCGM.

**Part Two**, Chapters Four to Eight, presents the RCGM as a discourse. This comprises the: ‘Social Practice’, ‘Discursive Field’ and ‘Text’ of the RCGM debate. Chapters Four and Five cover the ‘Social Practice’ and ‘Discursive Field’ of the RCGM and form Subsection One. Instead of a chapter on each of these I have found it more useful to break this information up into the influences of modernity and possible challenges to it. This means that within both of these chapters the ‘Social Practice’ and ‘Discursive Field’ are combined. Chapter Four, ‘Modernity’s Rationale,’ outlines the development of modernity and the corresponding establishment of hierarchical dualisms. The basis is then established for the ‘mapping’ of the dominant knowledge systems in science and law. This chapter goes on to address the processes that center around the interest groups that were given ‘Interested Persons (IP) status’. I explore how the legal-scientific rationality of the RCGM processes marginalised IP’s objections to GE.

Chapter Five, ‘Contesting Modernity’, provides a brief exploration into another historical and social influence that may also have shaped the RCGM and the production of the texts—environmentalism. In this second chapter of Part Two Subsection One, I examine environmentalism as a possible challenge to modernity’s rationale. The

popularity of environmental sentiments is also commented upon, as they are expressed in the texts of all three groups.

The final element of the discourse of the RCGM is the 'Texts'. These form Part Two Subsection Two, and encompass Chapters Six through to Eight. Chapter Six 'unpacks' the 'Life Sciences',<sup>25</sup> Hegemonic,<sup>26</sup> Tropes' found in the bioproponents submissions and witness briefs to the RCGM. Three tropes, which naturalise modernist dualistic concepts, are identified. These are: the presentation of autonomous science as Progress,<sup>27</sup>, science as neutral, and, that society should trust scientists as they are the 'experts'.

As tropes can be seen as unraveling like a conversation, the next chapter, Chapter Seven, analyses how the environmental groups were '(En)Countering Hegemonic Tropes' in their presentations to the RCGM. I begin with revisiting the issue of environmentalism as a challenge to modernity by examining the environmentalists' use of science. I then identify the tropes used by environmentalists to counter the hegemonic tropes of the bioproponents. Two tropes, the notion of sustainability and proposition of the precautionary principle, are discussed as forming part of the renegotiation of 'science'.

In Chapter Eight I examine how the bioproponents were 'Meeting the Challenge' presented by the environmentalists in their submissions and witness briefs to the

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<sup>25</sup>. Life Science corporations are the transnationals corporations that control GE interests (see footnote 65, p.126).

<sup>26</sup>. Hegemony is 'naturalised' dominant thought (see Chapter Three for a more detailed discussion).

<sup>27</sup>. I choose to capitalise this use of the term 'Progress' to separate it from the common usage of the word which means improvement (see Chapter six).

RCGM. I comment on the bioproponents expression of environmental sentiments through their co-optation of 'sustainability' to mean GE, and also on their rejection of the precautionary principle as ambiguous.

**Part Three** is the final section of the thesis, which is about 'Bringing it all Together'. In Chapter Nine I analyse how the contestation over science, evident in the debate between the environmentalists and the bioproponents, led to the RCGM's findings. This chapter therefore includes an analysis of the text of the RCGM and could thus arguably have been in the text section. I have, however, chosen to present it in Part Three as I want this chapter to be more than deconstruction, and form a discussion, closing my analysis of the RCGM and moving onto ways to improve future public debates. To facilitate this, after analysing how the RCGM reflects the bioproponents findings, I then summarise the relevant developments in the public controversy over GE in Aotearoa New Zealand, before making some recommendations for both environmental groups and government regarding any future formal governmental inquiries.

In Chapter Ten I offer some concluding remarks on the discourse of the RCGM, summarising how the RCGM marginalised public dissent through the modernist rationality of its processes. After reflecting upon the utility of the approach I have used to examine this issue, I then recommend areas for further research to explore issues, related to public debates, raised in this study.

## 2

THEORETICAL CONTEXT

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In the previous chapter I established the background for examining if the RCGM was predetermined in its findings and contextualised the RCGM in a volatile political climate surrounded by established critiques of inquiries. In this chapter I argue the case for the interdisciplinary theoretical perspective I have taken to view this research. Endeavouring to describe the theoretical context of a thesis is like a researcher attempting to share with a reader the ‘viewfinder’ from which to view the study. This means attempting to describe why the researcher has taken a particular approach to the project. In effect it is a description of the theory behind the methods selected—the methodology. It is necessary to convey such theories as they describe

*the way in which the mind works to understand the reality it confronts. It is the self-consciousness of that mind, the awareness of how facts experienced are perceived and organized so as to be understood (Cox, 1995, p.31).*

Developing the context of a study, in addition to involving a number of pragmatic decisions, is deeply personal as it combines not only the selection of theoretical perspectives the researcher believes will elucidate the issues but also the selection of theories which reflect the closely held, cultural and personal (often including spiritual), values of the researcher.

The theoretical context I have used for this study relates to my faith in the value of interdisciplinary scholarship for environmental goals. It is principally because of this belief that this thesis will be presented in (human) geography, which is concerned with the relationships between people and the environment.

The interdisciplinary nature of human geography enables me to utilise insights from a number of complementary disciplines such as: environmental sociology, in particular STS; and (political) ecology, specifically ecofeminism; and bring these together with a postmodern emphasis to provide the interdisciplinary environmentally orientated perspective of this thesis. Before outlining the disciplines used in this research I will first briefly describe the ontological and epistemological orientation of this study.

## **2.1. Ontology and Epistemology**

The perspectives utilised in the thesis challenge the ‘rationality’ of modernity—that ‘reality’ is composed of purely objective phenomena that can be quantified through science. A theme running through my approach is the rejection of the notion that reality exists outside the researcher to be ‘discovered’.

I believe that the reality of research is a dialectical relationship that shapes, and is shaped by, the research through a reflexive process (see Chapter Three). Thus reality, like the environment, is ‘a ‘quasi object’ traversing both the physical world and cultural discourse thereby blurring the subject-object distinctions that permeate western

intellectual thought' (Gandy, 1997, p.154). This does not mean that the physical environment and environmental problems do not exist, or that they are irrelevant, but that people must understand the importance of their perception of reality. This difference between a realist and constructivist ontology is articulated by Bruce Ryan (1999):

*It is assumed that all persons who perceive reality will, if they are accurate in their perceptions, perceive the same reality (the physical entity will have the same meaning for all knowers). Where reality is said to be created or constructed, it is understood that, while the physical entity does exist external to the knower, it has no meaning until such meaning is created by and for knowers in their interactions with the social or verbal community in which they live . . . The meaning, so constructed, becomes the lived reality of the entity for the person (p.485-486).*

This is evident in the way people do not respond to all environmental problems that exist, but rather take action on learning of an environmental issue that they see as important (Strydom, 2002; for a stronger social constructivist position see Douglas & Wildavsky, 1982). Maarten Hajer (1995) describes the social construction of reality: 'Reality, then, is always particular, it is always dependent on subject-specific framing or time-and-place-specific discourses that guide our perceptions of what is the case' (p.17). Meaning is therefore produced through language. This notion will be elaborated upon in Chapter Three.

The ontology I have described is postmodern. 'An overriding characteristic of postmodern thought has been the wide-ranging challenge to existing approaches to intellectual and scientific inquiry' (Gandy, 1997, p.154). It follows then that research is not an objective quest to uncover the 'truth' but a mission seeking to understand situated meanings. These meanings are created by participants in particular

conversations through a process of social negotiation (Cheney, 1989; also see Chapter Three). Researchers of knowledge from anthropology and sociology have argued that ‘facts’ are dependent on the accepted framework of social principles used (Schwarz & Thompson, 1990). Similarly science, which has cultural authority, at least in western societies, as the highest knowledge system, is socially negotiated—based on value assumptions (see Irwin & Wynne 1996; O’Riordan, 2000). The social construction of knowledge is important to developments in the social philosophies. David Collingridge and Colin Reeve (1986) suggest that: ‘The thesis that scientific method leads to truth, or at least to statements of high probability, has virtually no contemporary adherents in the philosophy, the sociology and the social studies of science’ (p 8). The construction of science is a key feature in this thesis, and science as a knowledge system will be further explored in Chapter Four.

### **2.1.1 Analysing the Royal Commission on Genetic Modification**

The social constructionist thread described above runs through the work of Beck, science and technology studies (STS) and ecofeminism. Although what I have just described as the ontology of this study at first appears to reflect a Becksian approach on nature as both social and observable (see below), it is the role of language that highlights the stronger social construction in my postmodern approach. Beck (1992a) rejects this relationship between language and nature, instead seeing social change as a procedure in reaching ecological modernity (see Lash, Szerszynski & Wynne, 1996). My approach more closely reflects STS and ecofeminism, as they provide theoretical

critiques of objective observation of a quantifiable reality. The social constructivist perspective is evident in ecofeminism's concentration on patriarchy's domination over nature, and women, being socially constructed through language. Accordingly feminism has been central to the development of postmodern geography (Johnston *et.al.*, 2000).

The method employed to illuminate the social negotiation of meaning is discourse analysis. This involves an analysis of text, its production and consumption and the social and historical context it is situated within (see Fairclough, 1992a; also see Chapter Three). Discourses are accordingly time-and-space-specific in addition to expressing both past experience and present preoccupations (Hajer, 1995).

This study entails the analysis of the struggle for discursive power within the RCGM involving the negotiation of meaning between the Commissioners, the environmental groups and the bioproponents. Analysing the influence of past and present preoccupations within the multi-dimensional discourse of the RCGM means analysing the influence of the structures of knowledge and the way this has in turn influenced the construction of the text and the resultant text. In this research it means analysing the influences of modernity on the RCGM and the social construction of the debate through the RCGM. It is an approach I call a process of 'co-construction'.<sup>28</sup> as I see the debate as being influenced<sup>29</sup> by the structures<sup>30</sup> of modernity, in particular reductionist<sup>30</sup> (scientific) thinking, and yet renegotiating meanings.

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<sup>28</sup>. My use of the term 'co-construction' is an extension of the term used by Alan Irwin (2001). I have subsequently found a similar use of the term by Tim Forsyth (2003).

<sup>29</sup>. Structures are 'internally related objects or practices' (Winchester, 2000, p.4). Those of interest to geographers are often those of an environmental, social, political or economic nature (Winchester, 2000).

## 2.2 Geography

My interdisciplinary environmentally orientated approach to research has been both 'at home' and theoretically challenged, and thus extended, in geography. Human geography consists of a multitude of approaches (Dear, 1988), but I see human geography as concentrating on the relationship between people and the environment with a temporal and spatial awareness. Developments in geography have seen it moving away from technological determinism as the basis of this relationship (Dear, 1988; Peet, 1989). Geography, like some developing disciplines such as environmental sociology, challenges the traditions of social philosophers (or more accurately social 'scientists' in this case) as 'underlabourers, filling a few well-defined gaps in the natural science agenda and provid[ing] the human stuffing for economic and natural scientific models' (Shove, 1994, p.263; see also Hannigan, 1995). Instead geography allows for people to be seen as constitutive of the 'environmental crisis'. This means the use of geography can involve viewing people as transforming their surroundings (Adams, 1995).

Recent developments have led to some geographers, often called cultural geographers, paying attention to the way this is achieved through political, economic and social processes (Dear, 1988; Harvey, 1996). The establishment of feminist geography and postmodern geography (see Bondi & Domosh, 1992; Butler, 1990; Dear, 1988; and

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<sup>30</sup> Reductionism refers to the concept that a complex system can be abstracted and comprehended through the isolation and analysis of an aspect of that system (see Capra, 1997). Therefore according to this philosophy of science the whole is nothing but the sum of its parts. 'Reductionist science consists of determining the size, and number and spatial configurations of the constituent parts of the universe and its contents' (Kneen, 1989, p.129). For a discussion on reductionism and the science of genetic engineering see Lawrence Busch, William Lacey, Jeffrey Burkhard & Laura Lacey (1991); Vandana Shiva (1993; 1994); and also Peter Wills (1998).

Johnston *et.al.*, 2000) have been particularly helpful in providing approaches for this. These developments in geography are of importance to this research. As I have chosen to discuss feminism under ecofeminism, as this encompasses environmentalism (see below) I will now turn my attention to postmodernism.

Postmodernism is characterised by a rejection of grand theories. This includes scepticism towards the corresponding privileged epistemology of science and the belief in foundational relationships that are fixed in space and time (foundationalism). Hence postmodernism can be seen as critiquing Enlightenment thought (Dear, 1988; Gregory, 1989; Johnston *et.al.*, 2000; Lyon, 1994). Raphael Sassower (1995) proposes that the critique of Enlightenment legacies within postmodernism may be useful to transcend the binary between Enlightenment and Romanticism<sup>31</sup>, and optimism and pessimism.

As a theory, postmodernism has developed from the works of scholars such as Jacques Derrida, Jacques Lacan, Julia Kristeva, and Michel Foucault. Although their approaches vary greatly a common thread is their focus on language, meaning, and subjectivity. Meaning is not reflected by language, it is not an objective medium of description, but is produced through language. As such meaning, rather than remaining fixed, is constantly changing and consequently is the site of political struggle (Peet & Thrift, 1989).

The critique of Enlightenment legacies is therefore central to this research. It is for this reason I have chosen to utilise Beck's conceptualisation of Modernity and risk, to

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<sup>31</sup>. I have capitalised 'Romanticism', to separate this use from the common usage of the term. Romanticism refers to the movement that contrasted with Enlightenment in a number of ways (see Chapter Four).

provide the main theoretical underpinnings of this research. Beck is not a postmodernist although he focuses on Modernity and beyond.<sup>32</sup> I have therefore supplemented his insights with newer developments in the sociology of science specifically STS, and relevant recent developments in political ecology, specifically ecofeminism.

### 2.3 The Work of Ulrich Beck

Beck's sociological analysis of risk is relevant to provide a historical framework of change in which to situate the RCGM (this is established in Chapter Four) and will be utilised when deconstructing notions of Progress, science, and the expert/lay person divide.

Beck's most popular work is *Risk Society* (1992a) (first published in German as *Risikogesellschaft* in 1986) where he establishes his thesis on the significance of risk. Some of his later works continue to expand upon this theory (1992b; 1995; 1996a; 1996b; 1997; 1999). A pivotal feature of Beck's work is his conceptualisation of three periods of societal transition: modernity, second modernity, and reflexive modernisation (risk society). Modernity refers to industrialisation, or more precisely several interrelated historical processes, events, ideas and periods that reinforced each other—Renaissance, the Reformation, the Enlightenment, and the democratic,

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<sup>32</sup>. Although both postmodernism and postmodernity refer to the 'exhaustion of modernity', the key difference is that descriptions referring to postmodernity emphasise 'putative social changes' (see David Lyon, 1994).

industrial, and scientific revolutions (Oelschlaeger, 1991). Second modernity, the phase, that according to Beck, industrialised societies are currently in, forms the transitional stage between industrial society and reflexive modernity. The latter stage is an alternative modernity—an ‘ideal type’ future—in which society comprehensively and proactively reflects upon and addresses the processes, ideals, and failings of modernity.

A defining factor in this model of societal transition is the change in risk. Whereas industrialisation risks were spatially and temporally fixed, such as factory waste, new ‘mega-hazards’ escape both spatial and temporal fixivity. Industrial risks were calculable and insurable: mega-hazards are incalculable and uninsurable—global disaster cannot be insured against. Nuclear and genetic engineering hazards typify risks of second modernity by defying local or regional boundaries, threatening future generations, and involving uncertainty.<sup>33</sup> and remaining uninsured (Beck, 1999). Society, in moving from modernity to second modernity, has changed its focus from the production of wealth during industrialisation to the production of risks (Beck, 1992a; 1999).

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<sup>33</sup>. Uncertainty refers to scientific uncertainty. This occurs when it is not thought possible to predict outcomes. It goes beyond not being able to predict probability and includes not being able to predict the type of outcomes that will eventuate. Another important factor that is intermeshed with uncertainty is ‘ignorance’ and ‘indeterminacy’. At any level of uncertainty those concerned may also be operating out of ‘ignorance’, through not knowing what they don’t know, or operating out of ‘indeterminacy’, in which they cannot know that they need to know (Deville & Harding; 1997; also see Wynne, 1992). Genetic engineering, critics believe, exists under uncertainty, as risks may trigger complex interactions within the ecosystem that cannot be foreseen let alone calculated, and also under indeterminacy, as it is not thought possible to know how to go about researching all of the possible effects of GE. Uncertainty is a reoccurring theme throughout this thesis as it is one of the preconditions for prescribing the precautionary principle (see Chapters Seven to Nine).

In second modernity society becomes aware that mega-hazards stem from industrialisation through the ideologies and practices of modernity, yet still attempts to manage these hazards with modernist processes (Beck, 1992a; 1995). Environmental controversies, such as that over GE, are seen by Beck as part of a societal progression from industrialisation to a period of proactive reflection. This is because environmentalism may be seen as a critique of modernity in that it draws attention to the environmental costs of industrial progress and technological development (Beck, 1992a; 1999; also see Chapter Seven). For Beck the challenge to progress is society's inability to manage new mega-hazards with modernist thinking. This is a critique of the social basis of rationality which is science, law and democracy (Beck, 1992b) (see Chapter Four).

Central to Beck's thesis is the way in which addressing unlimited faith in science and technology requires challenging the corresponding elevation of scientists to the status of 'experts'. Beck (1992a) discusses the scientisation of risks in which the increasing role of science in risk determination leads to the consequential framing of the public as only capable of 'perceiving' risk, as opposed to having any knowledge of risks (see Chapter Six). This contributes to a process which not only elevates scientists to the status of experts on risk but also devalues the public to passive consumers of scientific information. Differences in risk estimation by experts and lay people are consequently explained as the public being irrational or hostile to technology. This model of science and the public is called the public understanding of science (PUS) model, and is challenged by science and technology studies (see below).

Beck (1992b) suggests that ‘in matters of hazards, no one is an expert—particularly not the experts’ (p.106). He sees risk decisions as being value decisions, does not believe in objective risk estimates and instead proposes that loss of faith in science will lead to reflexive modernisation. He contends that unlimited faith in science and technology will be replaced with sciences that refer to the publics’ estimations of risk.

From this perspective science is part of ‘organised irresponsibility’ in which it continues with modernist assumptions of objective risk estimations, creating technologies that lead to environmental problems, while unable to control the risks that emerge (see Beck, 1992b). This is because ‘the sciences are entirely incapable of reacting adequately to civilization risks, since they are prominently involved in the origin and growth of those very risks’ (Beck, 1992a, p. 59). Rather than science being capable of finding solutions to environmental problems Beck argues that scientists, along with governments, operate within organised irresponsibility. The management of new risks with modernist systems, that attempts to control hazards, condones the continuation of the hazard. For example, pollution limits, in setting a limit for pollution, condone the continuation of pollution (Beck, 1992a).

It is not just governments but also science that are implicated in organised irresponsibility, as Beck proposes that politics in second modernity is not confined to governments but is created through ‘subpolitics’ (Beck, 1999). Groups through their actions are creating political order, yet they do not have the same formal rules of politics, they do not have a ‘party’, they are not democratically elected, and are not responsible to all those affected in the same way that political parties are. Subpolitics

are created, for example, in scientific journals, through medicine, law, and the organisation of work.

Beck (1999) argues that these developments forming second modernity are a necessary, rather than an optional, part of the process that society will go through before becoming self-confronting. Environmental problems will then not be seen as external but will be considered as central, lying within the institutions that comprise institutions.

The centrality of social structure to environmental problems is clear in Beck's thesis:

*Environmental problems are not problems of our surroundings, but—in their origins and through their consequences—are thoroughly social problems, problems of people, their history, their living conditions, their relation to the world and reality, their social, cultural and political situations (1992a, p.81).*

The social constructivism within his work is evident. Beck does not, however, deny the physical nature of these problems and as a result his approach has been critiqued by both social constructivists and realists alike (Syrydom, 2002; see also Hannigan, 1995; Lash, Szerszynski & Wynne, 1996; Szerszynski, 1996; and Wynne, 1996). He has been criticised for stressing that global risks are objectively certifiable, and also that they are entirely socially constructed (Hannigan, 1995). As Beck supports both social construction and the physical realism of environmental problems Piet Syrydom (2002) categorises Beck as a 'weak constructivist' or a 'constructivist realist'. However, Beck rejects the combination of realism with constructivism, clarifying his position in his more recent work *World Risk Society* (1999). Here he suggests that his analysis is not based on one perspective but that he utilises both realism and constructivism as a matter of 'pragmatic choice' (p.135) not a combination of both.

## 2.4 Science and Technology Studies

Science and technology studies is another sociological approach which, like the approach of Beck, is not strictly environmentalist but critiques the modernist expert/lay-person hyper-separation and is therefore useful for pursuing environmentally orientated goals. Addressing this divide is a characterising achievement of STS.

The traditional approach to technological risk traced through sociological literature, is to frame environmental/technological disputes in regards to the PUS model (Wynne, 1995). From this perspective the disparity in views between biotechnology developers and some members of the publics exists as a 'deficit model'. This positions the publics who are wary of technologies as having a deficit in their knowledge (Cozzens and Woodhouse, 1995; Irwin, 2001; Wynne, 1995; 1989). Debates become framed as scientific issues. In order to resolve these conflicts over risks, these members of the publics are consequently seen as needing more 'education' to bring their views closer to those of the scientists.

One of the problems in this approach is that it requires the publics to put their faith in experts such as scientists, when it is experts who have accused them of having inadequate knowledge to have a rightful place in the debate (Cozzens & Woodhouse, 1995; Wynne, 1989). The deficit model leads to 'impoverished decision-making processes, and encourages the very polarisation that the experts lament' (Wynne, 1989, p.33). When members of the publics then challenge issues framed in science, they are then perceived as anti-science (Wynne, 1995). The debate stagnates, as it becomes

viewed as parties either 'for' or 'against' the particular technology, and the publics are placed in an inferior position.

The importance of the insights that have been produced through (STS) scholarship is that they overcome the creation of a homogeneous science versus the diverse publics dichotomy, by recognising that all knowledges are socially situated (see Irwin & Wynne, 1996). Rather than viewing the publics as 'anti-science' this perspective facilitates them in being seen as 'pro-knowledge', because they are attempting to revalue marginalised knowledges excluded by science as opposed to devaluing science as such (Cozzens & Woodhouse, 1995). Groups become viewed not as passive reactors to technological developments but as inextricably involved in the construction of the very dispute. The controversy over the technology is seen as culturally created through the discourses of those engaged in the debate. Language is then viewed not as a neutral descriptive medium but as part of the debate's construction. This emphasis on the construction of environmental issues runs through (political) ecology, while the role of language in constituting the 'environmental crisis' is particularly pertinent to ecofeminism.

## **2.5 (Political) Ecology**

Political ecology was coined in the 1970s, and gained definition in the 1980s with the sudden abundance of publications discussing it (Bosselmann, 1995; Peet & Watts,

1996). James Greenberg (1994) suggests that it would be ill-advised to define political ecology, but rather suggests all such work has a common core (see also Peet & Watts, 1996). In discussing the application of political ecology he proposes that there is a consensus amongst the social philosophies that more research needs to focus on the relationship between policy, politics or the political economy, explicitly addressing the environment. However, it is possible to break down 'ecology' and 'political' to provide a definition of political ecology. Ecology can be seen as an analysis of 'patterns of interaction between species and their environments', with politics being the 'use of power and authority in . . . regulation and control' (Dwivedi, 1986, p.378). Further detail to the meaning of political ecology is provided by Raymond Bryant (1991) who suggests that political ecology 'may be defined as an inquiry into the political sources, conditions, and ramifications of environmental change' (p.165; see also Forsyth, 2003; and Peet & Watts, 1996).

The origins of political ecology can be traced back through political economy, which has its roots in the works of authors such as Thomas Hobbes (see Hobbes & Tönnies, 1969), Adam Smith (1910), and Karl Marx (1970). The word economy in political economy is not restricted to the world of financial transactions, but instead is used in the much broader sense of a social economy. This in turn is seen as being grounded in the mode of production (Peet & Thrift, 1989). Therefore the economy is not seen as neutral, but rather a political act of social production which is carried out by members of classes (Peet & Thrift, 1989; see also Marx, 1970). Political economy can be generalised into neo-classical political economy, which is based on the work of economists such as Smith (1910) and critical political economy, which is also referred

to as marxian political economy, or radical political economy. Critical political economy focuses on social structures, how they came into being, and how they can be influenced to change (Cox, 1995) (For a further discussion of neo-classical and critical political economy see; Caporaso & Levine, 1992; Cox, 1995; and Sayer, 1995).

Political economy addresses nature and society as largely socially constructed, yet constrained within systems. One of the criticisms of political economy, and an influence in the consequential development of political ecology, is that political economy has tended to blatantly ignore all that is not human (Greenberg, 1994). Dwivedi (1986) suggests political economy relies on the assumption that nature is merely a pool of natural resources to be exploited. In contrast, he believes that political ecology demands both a change in the political system, and a change in the way nature is viewed.

Despite the centrality of the environment to political ecology, Gerard Strange (1996) contrasts it to environmentalism. Environmentalism is seen as attempting to address the relationship between economic growth and environmental degradation through focusing efforts on trying to persuade governments to place limits on pollution and ecological destruction. Environmentalists, therefore, are seen as having failed to analyse the historical and political factors that contribute to the environmental crisis. 'While such regulations have the effect of altering the environment in which capital accumulation takes place they do not alter the consciousness of individuals and groups subject to regulation or fundamentally challenge or transcend the paradigm of accumulation' (Strange, 1996, p.84). Capitalism, then, accommodates environmental

regulations and turns these to its advantage. Political ecology contrasts with environmentalism, as it addresses the degradation of the environment within the context of the development of capitalism and the consequential requirement of capital accumulation. In this way political ecology addresses the cause of the environmental crisis rather than attempting to place regulations on environmental damage (Strange, 1996).

The causes of environmental problems are often linked back to the 'success' of Cartesian dualisms<sup>34</sup> over holistic thinking. This has meant that reductionism has become the basis for science and philosophy (Bosselmann, 1995). The utilisation of political ecology is seen as challenging both hegemonic blind faith in science and technology and a Judeo-Christian perspective. A faith that science and technology will solve environmental problems is perceived as misplaced and dangerous. Such thinking is seen as leading to the creation of nuclear and genetic technologies. In contrast political ecology is seen as relying on integrated interdisciplinary thinking. It also confronts Judeo-Christian thinking which places humans at the top of a hierarchy, in which nature is seen as existing only for the good of humankind (see Dwivedi, 1986).

### **2.5.1 Ecofeminism**

The combination of (political) ecology and feminism is presented as a way of addressing and overcoming dualisms. Ecofeminism is an emerging school of thought popularised by authors such as Sandra Harding (1986), Val Plumwood (1993),

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<sup>34</sup> References to Cartesian dualism refer to the work of French philosopher and mathematician Rene Descartes. His scholarship was based on the metaphorical separation of the body and mind, and the parallel abstraction of nature from complexity through reduction.

Vandana Shiva (1989; 1994; 1996; 1997), and Carolyn Merchant (1996). It seeks to overcome the separateness of many of the established movements (Bystydzienski, 1994; Shiva, 1997). For example, Shiva (1997) proposes that as separate entities feminism and environmentalism uphold the dualisms that put man in opposition to and above woman and nature, thus they can only seek concessions within this paradigm. Jill Bystydzienski (1994) suggests that ecofeminism is the linking of the feminist, peace, and environmental movements which supports an alternative paradigm based not on domination but on partnership, viable ecosystems and positive peace.

Plumwood (1993) notes that even among ecological feminists there is a huge diversity of views about the connection between women and nature, how to revalue this, and the exclusion of women from culture. Bystydzienski (1994) suggests that, despite different people and groups having different emphases there are core values amongst all ecofeminists. These are: 1) the interconnectedness and interdependence of all living things; 2) non-hierarchical values—thus the eradication of injustices such as sexism, racism, ageism, classism and anthropocentrism; and, 3) peace—living in harmony with the natural environment.

However, the core and defining issue within ecofeminism is the relationship between women and nature and there is a split between those who view this relationship as based on biological grounds and those who view it as based on cultural grounds (Hay 2002). The biological determinist branch of ecofeminism proposes that due to their reproductive abilities, in particular their menstrual cycles, women are closer to nature. Ecofeminists who see this relationship as culturally based believe that the special

relationship is due to the oppression of both nature and women by patriarchal structures which emanated from dualisms in Enlightenment thought (see Hay, 2002). In keeping with the theoretical approach of this thesis it is this cultural interpretation of the relationship between women and nature that I refer to in this research as ecofeminism, and it is to this point I will now turn.

Merchant (1996) describes the relationship between the oppression of women and the degradation of the environment as follows:

*In investigating the roots of our current environmental dilemma and its connections to science, technology, and the economy, we must reexamine the formation of a world view and a science that, by reconceptualizing reality as a machine rather than a living organism, sanctioned the domination of both nature and women (p.76).*

Furthermore, ecofeminism provides insights into the construction and reinforcement of the ideals, that permeate language enabling environmental degradation based on the oppression of both women and nature (Merchant, 1996; Plumwood, 1993; Shiva, 1994; 1996). Plumwood (1993) describes this as:

*Forms of oppression from both the present and the past have left their traces in western culture as a network of dualisms, and the logical structure of dualisms forms a major basis for the connection between forms of oppression (p.2).*

It is the modernist dualisms which separate man from nature, which are a central focus of the ecofeminist attempts to address the interconnected web of oppressions. Despite their centrality to much philosophical and feminist thought, dualisms have only been vaguely articulated. The most extensive investigation of these is given by Plumwood (1993; see Chapter 4).

These dualisms act to naturalise and thus make hegemonic oppressions such as those of nature and women (and other marginalised groups). Dualisms therefore must be addressed to overcome the subordination of both women and nature (Merchant, 1996; Plumwood, 1993; Shiva, 1994). Plumwood (1993) differentiates between dualism and dichotomy suggesting that the difference is that in a dualism the hierarchy of the pair is socially entrenched. Dualisms do not so much create difference where none existed but structure difference within a hierarchy. Hence it is not a goal of ecofeminist research to merely to dismantle a dualism but to reconceptualise the difference.

Together these approaches have enabled me to analyse the time-and-place specific discourse of the RCGM, in which the bioproponents, the environmental groups and Commissioners construct meaning. The following chapter on methods details how I have gone about this analysis.

## 3

## METHOD

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In the previous chapter I argued that drawing on a number of relevant disciplines would aid in my analysis of the RCGM. In this chapter I argue the case for the method used in this thesis. I have developed the method of this research to enable me to conduct an analysis of the social processes underlying the RCGM, concentrating on the way issues were constructed and defended. Although I have called this a ‘method’ chapter it will be apparent on reading it that some of the discussions could arguably just as easily be found in a ‘theoretical context’ chapter. The ontology, epistemology and methodologies of the various approaches I have used are all closely intertwined. While such separations between theories and methods are artificial, they are helpful in order to present the research in a thesis form.

I have constructed this separation by placing in this ‘method’ chapter:

- the approaches I have taken for selecting and handling the data; and
- reflections on, and considerations regarding, how I have undertaken my research.

I begin this chapter by outlining ‘boundary work’ in which the interfaces between issues are seen as being under constant re-negotiation. This, together with critical discourse analysis, which is the use of language to analyse power relations, has

informed the way I have conducted my research practice. The thesis is structured in the form of a Faircloughian discourse model, to analyse the boundaries of 'science' in the debate. I then describe the development of the topic, including the issues involved in being an activist-academic. Finally, I outline how I went about the research: conducting interviews; selecting my interviewees, groups and text; and how I deconstructed the text.

### **3.1 Boundary Work**

As noted in the previous chapter, within boundary work, representations of reality are viewed as constructed through language which means that knowledges are seen as cultural constructs (Cozzens & Woodhouse, 1995; Gieryn, 1995; 1999; Wynne, 1989). For example, nature does not speak for itself but knowledges about nature are produced socially through negotiation (Martin & Richards, 1995). It is therefore useful to see the positions of those supporting and opposing the development of genetic engineering as utilising knowledges that are socially embedded, '[o]therwise, we are doomed to a sterile and even counter-productive juxtaposition of 'science against 'non-science' rather than an appreciation of the diversity and social interdependence of different forms of science, knowledge and expertise' (Irwin & Wynne, 1996, p.6). Public and scientific knowledges alike are hence seen as based on broad commitments and assumptions (Irwin & Wynne, 1996). (The social construction of science, a central feature of this thesis, is explored in Chapter Four).

Using this basis for the investigation of the RCGM means the research addresses the question: ‘How are knowledge claims constructed and defended?’ (Irwin, 2001, p.15). Such an approach is referred to as boundary work, as it involves working with the constantly re-negotiated boundaries between society and science, and science and non-science (Gieryn, 1995; 1999). Gottweis (1998) proposes that ‘the boundaries of politics, and science and technology are always drawn within the larger semiotic context of the various stories that give a society its identity and hold it together’ (p.31). These boundary negotiations are disputes over credibility—who has the right to speak (for nature for example). It involves groups manipulating the boundaries of knowledge systems to legitimate their beliefs about reality and accordingly securing epistemological authority (Gieryn, 1999). ‘Epistemic authority does not exist as an omnipresent ether, but rather is enacted as people debate (and ultimately decide) where to locate the legitimate jurisdiction over natural facts’ (Gieryn, 1999, p.15).

Specific examples of boundary work by Thomas Gieryn (1995) include monopolisation, expansion, expulsion and protection. Monopolisation involves groups assigning intellectual authenticity and authority to the cultural space they locate themselves within. This can occur, for example, when environmental groups refer to themselves as the only ones truly working for the good of the ecosystems. Expansion is when ‘insiders’ attempt to ‘push out’ the boundaries of their cultural authority into areas already claimed by others. For example, this can occur when bioproponents present themselves as ‘the environmentalists’ in an argument. Expulsion is when ‘insiders’ attempt to expel members they see as not being authentic members. For example, members of a group of scientists may dismiss certain scientists as being ‘not

real scientists' and thus attempt to exclude them. Finally, there is protection in which attempts are made to keep knowledges distinct. For example, science could be presented as separate from politics, and therefore 'objective'. These four examples illustrate ways in which debates about new technologies can be constructed through the constant re-negotiation of concepts such as science.

Boundary work can allow investigation into the cognitive authority science holds, when describing nature (or in this case GE), without according essentialist qualities to science. Gieryn (1999) describes viewing science as a cultural construct:

*When considered as a cultural space constructed in boundary-work, science becomes local and episodic rather than universal; pragmatic and strategic rather than analytic or legislative; contingent rather than principled; constructed rather than essential (p.27).*

Within disputes adversarial groups are involved in the manipulation of the boundaries of science to legitimate their beliefs about reality to achieve provisional epistemological authority. With this comes credibility and influence (Gieryn, 1999). This is also how the authority of science can be reproduced within debates. Science has endured partly due to its flexibility in the attributes assigned to it.

*It is exactly this pliability and suppleness of the cultural space 'science' that accounts for its long-running success as the legitimate arbiter of reality: science gets stretched and pulled, pinched and tucked, as its epistemic authority is reproduced time and again in a diverse array of settings (Gieryn, 1999, p.xi).*

The research for this thesis involves analysing the construction and defence of the knowledge claims surrounding 'science', the role of 'experts' and 'Progress' in relation to the RCGM. These claims are debated in the language of the environmental groups and the bioproponents and I will argue that the negotiated meanings are evident in the Commission's findings.

### 3.2 Critical Discourse Analysis

The method for this study of language is critical discourse analysis. Discourse analysis has become popular for analysing social change (Fairclough, 1992a; Thompson, 1987) that can be seen occurring through the re-negotiation of issues' boundaries. Fairclough (1992a) comments that:

*Today individuals working in a variety of disciplines are coming to recognize the ways in which changes in language used are linked to wider social and cultural processes, and hence are coming to appreciate the importance of using language analysis as a method for studying social change (p.1).*

The words 'discourse analysis' are not self-explanatory. There are a variety of methods of discourse analysis used across academic disciplines. The approach I take is based on the work of Fairclough (1989; 1992a; 1992b; see also Chouliaraki & Fairclough, 1999) who emphasises the political nature of discourse analysis, the struggles surrounding meaning, and the interconnectedness of power and language. This approach departs from the roots of discourse analysis that can be found in linguistics, in which analysis is conducted only on the text. It is a multi-dimensional framework for discourse analysis in which the meanings embedded in text are seen as produced, and existing, within a wider social context. In taking this approach traditional linguistic discourse analysis is combined with social analysis, creating a social theory of discourse. The resultant approach is called critical discourse analysis as it is used to analyse and critique power relations with the aim of challenging the dominant social order (Phillips & Jorgensen, 2002).

The popularisation of the term discourse, and of discourse analysis as a method of social investigation, can be partly attributed to Foucault (Agger, 1998; Fairclough, 1992a). Marianne Phillips and Louise Jorgensen (2002), however, argue that it would be misleading to claim that there is a Foucauldian approach to discourse, as Foucault's work on discourses differs between his 'archaeological' work (Foucault, 1972) and his 'genealogical' work (Foucault, 1980), despite some overlapping (Fairclough, 1992a). His emphasis is thought to have shifted from focusing on discursive formation (rules for constituting knowledges) to relationships between knowledge and power (Fairclough, 1992a).

The premise of discourses as contested sites of power can be traced back to Foucault's work on the professional discourses of criminality (Foucault, 1977) and sexuality (Foucault, 1978) which highlight the constructive nature of language and its relationship to the social construction of, and consequential punishment of, 'deviants'. In doing so he challenges the notion of power as used by authors such as Marx. Whereas Marx portrays power as 'top-down', and inherent within structures, Foucault portrays power as diffuse. Power is therefore both negative and positive. Ben Agger (1998) argues that Foucault's analysis is important as it allows for the role of human agency<sup>35</sup> within an analysis of power and language. Fairclough (1992a) takes a different view and asserts that Foucault's work overemphasises the role of structure and therefore underplays the role human agency can take in social change. He suggests that people are portrayed as necessarily resistant, yet helpless, within immovable systems of power and instead offers what he describes as a dialectical approach to social change.

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<sup>35</sup>. I use the term human agency to describe the autonomous will exerted by people to make social change (see Murphy, 1992).

His analysis of power is based on the work of Antonio Gramsci (see Gramsci, 1994). In Gramscian thought power is seen as operating within hegemony. This is an unstable but constant equilibrium built on subordination of groups and classes who are constantly struggling against this equilibrium. Hence the struggle is dialectical as people are shaped by discursive practices, yet are capable of influencing those practices.

The work of Bobby Sayyid and Lilian Zac (1998) is useful in providing an elaboration on the possibility for social change. They propose that structures are not ‘closed’—structures do not have ‘necessary and permanent elements or rules’ (p.253) making them immovable and impenetrable. Thus, structures are not seen as able to ‘close’ and have complete influence and domination. Similarly, subjects are not able to be sovereign. This creates a situation in which neither the structure nor the subject are able to ‘close the gap’—complete rules, or complete sovereignty. ‘This ‘never-closed gap’ is precisely the condition of the possibility of political life. It is here that the tension between agency and structure can be found. And it is this which is the domain of the political’ (Sayyid & Zac, 1998, p.253). Similarly, hegemony can never be complete. Accordingly resistance discourses, which attempt to subvert hegemonic discourses, have the possibility of success (Sayyid & Zac, 1998; see also Winchester, 2000).

Fairclough (1992a) describes this relationship between discourse and hegemony as two-fold—hegemony is both a matrix and model for discourse. Hegemony is a matrix for discourses in that social practices can be analysed for whether they ‘reproduce,

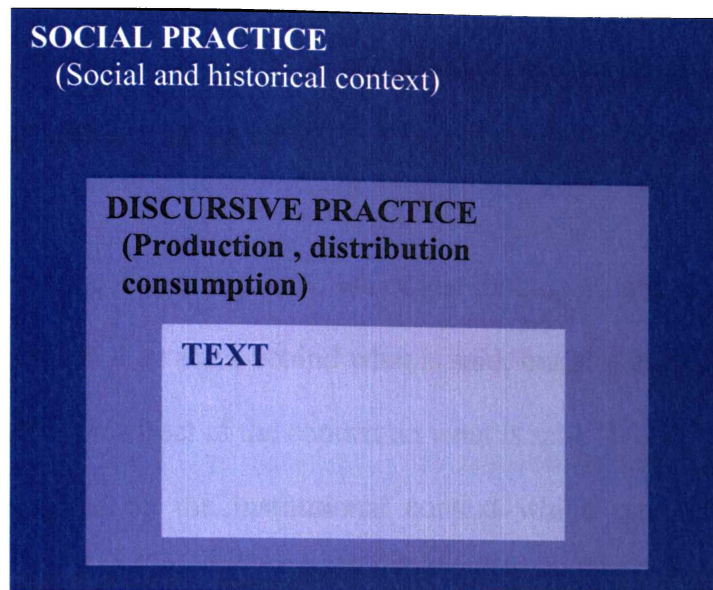
restructure, or challenge existing hegemonies' (p.95). It is also a model for discourse, as discourses can be viewed as sites of hegemonic struggles. Sayyid and Zac (1998) discuss how discourses can uphold hegemony. They suggest that there are two elements a discourse must contain to be hegemonic. Firstly, it must succeed in making its own rules appear to be the 'natural' rules. Secondly, it must contribute to the deactivation of projects against it. Conducting a discourse analysis therefore involves the analysis of these two. It means analysing not only the ways in which discourses uphold hegemony, but how discourses are also used to challenge hegemony and therefore create social change.

One of the important elements of the above description of discourse analysis is that it is a challenge to positivistic thinking. It is anti-foundational, anti-essential, and can be considered post-structuralist/postmodern. It is anti-foundationalist in that it enables people, politics and objects to be seen as constructed within a discourse (Sayyid & Zac, 1998; see also Howarth, 1998). It is anti-essential (meaning that the analyser does not rely on interpretation outside the discourse) as the meaning of phenomena such as nature, gender or ethnicity are constructed within a context. It is post-structuralist/postmodern in that it rejects the structuralist assumption that societal structures define reality. Instead, this form of discourse analysis portrays language as integral in the creation of reality. Fairclough (1992a) describes the constructive effects of discourse as contributing to the creation of social identities/positions, social relations between people, and, of systems of knowledge and belief. Discourse is a practice not just of representing the world but also of signifying the world and constructing it in, meaning.

### 3.2.1 The Discourse Model

The model of discourse presented by Fairclough has varied over time in his publications (1989; 1992a; 1992b; see also Chouliaraki & Fairclough, 1999) yet the principles underlying these models remain the same (Phillips & Jorgensen, 2002). For example, the terms used to describe the three aspects of his discourse model differ among *Language and Power* (1989), *Discourse and Social Change* (1992a), and *Critical Language Awareness* (1992b), while Fairclough chooses not to present his analysis of discourse in a three-tier model in his most recent work (Chouliaraki & Fairclough, 1999). Like Phillips and Jorgensen (2002), I believe the presentation of discourse in the three-tier model offers utility in explaining the interrelationship between language and power, and have chosen to utilise the model from *Discourse and Social Change* (1992a), as the terms applied to it most clearly articulate this relationship.

Fairclough's discourse model (see Figure 3.1) consists of three concurrent elements: text, discursive practice, and the social and historical context. Text is situated within the context of its discursive practice, which, in turn, is part of social practice. Text may be written material or spoken conversations which, once transcribed, can be deconstructed. Fairclough (1992a) refers to this as the formal discourse analysis. He stresses that texts provide 'meaning potential' which is interpreted. The meaning potentials are often diverse and even contradictory. As such, texts are open to multiple interpretations. 'This form of analysis reveals that it is naive to assume that texts have a single meaning which is intended by the author and read and interpreted by all.



**Figure 3.1: Application of Fairclough's (1992a) Three-dimensional Conception of Discourse.**

Instead there are multiple layers of meaning that can be derived from a text' (Forbes, 2000, p.127). As a postmodern method it is an 'implicit rejection of the notion of a single methodology for reading texts, or the idea that there is a single figure of authority who can provide a theoretical justification for this kind of analysis' (Forbes, 2000, p.139).

Fairclough (1992a) states that text cannot be separated from its production, distribution and consumption—the discursive practice. These elements of the discursive practice differ according to social factors. The production of a text may be the result of a collective effort such as in producing a newspaper, or an individual endeavour such as private study. Text may be distributed as a causal conversation or political speech. It may be consumed like a love letter, or a cookery book (Fairclough, 1992a). Discursive practices operate in the larger social practice. For Fairclough (1992a), social practice

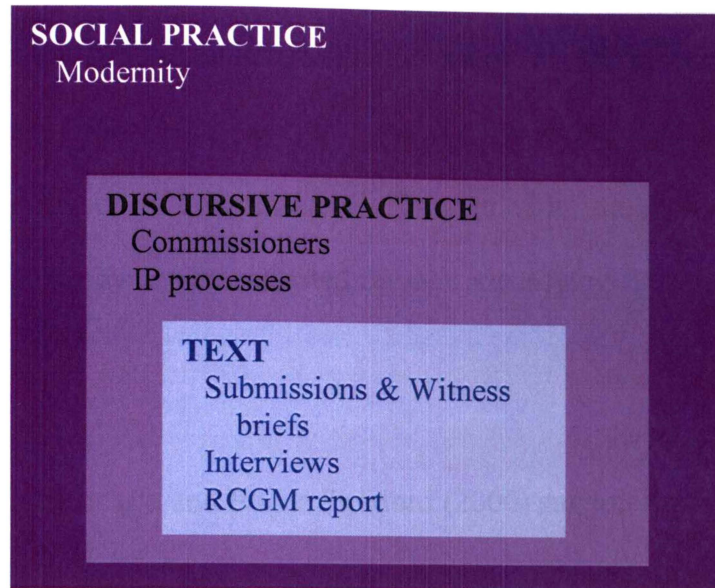
involves discourses operating within a hegemonic power struggle. Critical discourse analysis is therefore a way of investigating power struggles through analysing language, its production and its context.

This thesis, in addressing the RCGM, is not just looking at who is for and against GE, what is said, or even the values behind what is said, but as a critical discourse analysis it seeks to analyse the effect of the context on what is said. It looks at the way meaning is partly determined by the institutional context which renders persuasion of the consumer of the text more or less likely (see Doanti, 1992; also Hajer, 1995).

Fairclough's multi-dimensional discourse analysis model offers utility in analysing the RCGM (see Figure 3.2). The social context of the RCGM can be seen as influenced by modernity in particular by scientific and legalistic rationality. Within the social context lies the discursive practice which in this research consists of the influence of the Commissioners and the processes for Interested Persons. The final element of Fairclough's model lies in the text. This includes transcribed interviews (see Table 3.1 for a list of interviewees). These were generally with representatives from the environmental and the bioproponent groups detailed in Table 3.2, but also included are people who were involved in GE-Free Waiheke Island, and other people who provided additional insights. The text also includes the 1252 pages of submissions and witness briefs on behalf of the environmental and bioproponent groups (see Appendix 2)<sup>36</sup>; and the four volume 1200 page RCGM report.

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<sup>36</sup>. The submissions and witness briefs are accessible on <http://www.gmcommission.govt.nz>.



**Figure 3.2: Application of Fairclough's (1992a) Model to the RCGM Discourse.**

### 3.2.1.1 Multiple Texts: Triangulation and Crystallisation

The discourse analysis of the RCGM relies on the materials described above as texts, together with academic publications, articles from popular media, press releases, documents received from the various groups, and, my own personal experiences of the RCGM. The utilisation of multiple sources is traditionally referred to as triangulation. Norman Denzin (1970) likens triangulation to viewing the world through a kaleidoscope. He suggests that the method used is comparable to the angle at which the kaleidoscope is held, and as a result a difference in method or angle will reveal a different perspective or picture. He cautions, however, against seeing reality as possessing the fluidity of the sands in a kaleidoscope. Instead he proposes that reality resists one single interpretation.

Laurel Richardson (1998), although sharing many of the sentiments expressed by Denzin, suggests that the advent of postmodernism has led to the rejection of triangulation in favour of 'crystallisation'. Triangulation, she proposes is based on the assumption that reality can be validated through identifying fixed points to triangulate from.

However, Matt Bradshaw and Elaine Stratford (2000) suggest that it is not validity but rigour which is sought. They describe rigor as the trustworthiness and credibility of research—a process of constantly checking that the research and its method holds up to scrutiny. To triangulate, Richardson (1998) argues, implies three methods should be used to address one study but she states that there are many more than three ways to approach the world. However, it is noteworthy that triangulation is used to refer to at least three sources (see Bradshaw & Stratford, 2000). Richardson also deconstructs the image of a triangle in regards to validity itself—validity is not an unchanging two-dimensional object. She juxtaposes this image with that of the crystal; which ' . . . combines symmetry and substance with infinite variety of shapes, substances, transmutation, multidimensionality, and angles of approach' (p.358). Reality is consequently seen as beyond full comprehension, but multiple sources help elicit multiple perspectives on situations. The use of multiple sources in this thesis, like the goals expressed by all of these authors, is not to find the one 'truth' but to gain an informed interpretation of the RCGM and the discourses surrounding it as reflected in the theoretical context (see Chapter Two).

### 3.3 Situating Myself in the Research

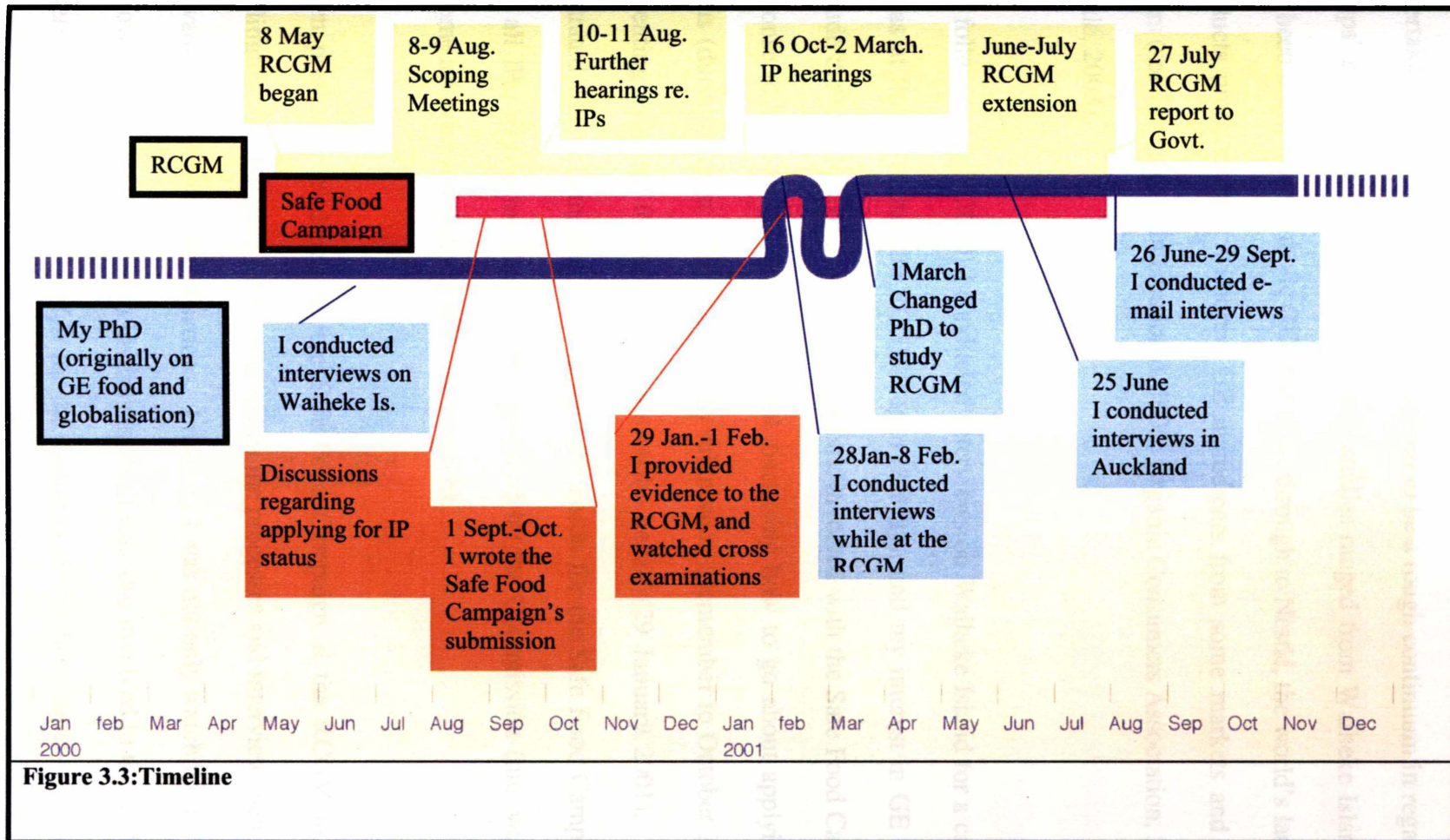
The personal experience I alluded to earlier, which provided me with an insight into the RCGM, was in fact my involvement in the process as a submitter. This developed along with my research, and is tracked on the following timeline (see Figure 3.3). The timeline depicts my study as a blue line which starts before the RCGM (the yellow line). The next line to emerge is the Safe Food Campaign's<sup>37</sup> involvement in the RCGM (red line). My research is shown as initially distinct from the other lines but moves through the Safe Food Campaign (red line) to contact with the RCGM (yellow line). My study is then depicted as retreating back from the RCGM before moving closer to mirror it. The blue line continues on this plane past the finish of the RCGM (and the final involvement of the Safe Food Campaign) illustrating my continued research attention on the processes of the RCGM. I will now briefly describe this intersection between my research and the RCGM.

I first enrolled in my doctorate (September 1999) with the intention of addressing GE, with a particular emphasis on food, and globalisation..<sup>38</sup> I set out to explore the social and historical power relations of the conflict between consumer concerns, regarding GE

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<sup>37</sup>. The Safe Food Campaign was created in Aotearoa New Zealand in 1994. It is committed to working toward safe healthful food. This includes campaigning to ban the importation of genetically modified foods, and encouraging organic food production. (For further details see Safe Food Campaign, 2003).

<sup>38</sup>. Ethical approval for my doctorate was gained through the University of Waikato Geography Department Ethics Committee, while overall research approval was gained through the University's Higher Degrees Committee.



**Figure 3.3: Timeline**

food, and globalisation. Using a critical political economy approach I intended to undertake six case studies on what appeared to be a rough continuum in regards to the groups' relationships to GE. These case studies ranged from Waiheke Island, which had been declared a symbolic GE-Free zone, through to Nestlé, the world's largest food products producer, that withdrew GE ingredients from some markets and not from others (see Greenpeace International, 1999; Organic Consumers Association, 2003, and Nestlé, 2003).

The following year (2000) I conducted interviews on Waiheke Island for a case-study. It was at this time that the RCGM began (8 May), and my interest in GE started to include the RCGM. I was invited to become involved with the Safe Food Campaign's response to the RCGM. This involved discussing how to go about applying for IP status (during August 2000), writing its submission (September to October 2000) and presenting evidence to the Commission on its behalf (29 January 2001). I became frustrated when attempting to write the submission for the Safe Food Campaign as I, like all IPs, had to use the template provided by the Commission (this was later to become a fundamental example in my research).

When presenting evidence for the Safe Food Campaign at the RCGM in 2001, in Wellington,<sup>39</sup> I also used my time to watch the processes and interview members from relevant environmental organisations. I realised I was not only watching the very type of power dynamics I wanted to investigate but I was also involved in them. It was this experience that acted as a catalyst for the evolution of this thesis topic—18 months into

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<sup>39</sup>. Wellington is the capital of Aotearoa New Zealand.

my doctoral study (1 March 2001). As Bradshaw and Stratford (2000) point out: ‘Sometimes we find a case, and sometimes a case finds us. In both instances, selection combines purpose and serendipity’ (p.41). This is how I feel about the development of my research into a focus on the RCGM.

When I began the interviews they were for my case-study research on consumer concerns and globalisation. I had originally intended asking environmentalists to describe their arguments against GE, and to deconstruct their comments. As the arguments used by the environmental groups were starting to appear on the Royal Commission of Genetic Modification’s website I decided not to ask them of their critiques. Instead, I asked the environmental group members about their tactics including their use of scientific arguments and any benefits and/or limitations they saw in this. When I thought through my work I realised that the tropes within the submissions were inseparable from the construction of the GE debate itself. I therefore decided that it would be an appropriate approach to analyse power relations as they operate within the Royal Commission itself, instead of the case-study approach I had planned.

On my return to Hamilton<sup>40</sup> I discussed with my supervisors what I had witnessed and been involved in, and my new insights. After submitting a revised proposal I changed my research to studying the RCGM and the way it marginalised public input. This new approach would lead to a more focused research question and to a deeper analysis of power dynamics.

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<sup>40</sup>. Hamilton is the city in which the University of Waikato is based.

With my revised topic I then sought further interviews with people involved in the RCGM. I traveled to Auckland<sup>41</sup> to undertake face-to-face interviews (25 June 2001), and conducted e-mail interviews with those further afield (26 June to 29 September). During this time the Commissioners gained a two-month extension and submitted their report to government (27 July 2001). I continued analysing the RCGM, submitting my thesis in 2004.

### 3.3.1 Third Space and Reflexivity

As described above, my interest in the resistance to genetically engineered food was the forerunner to my involvement with the Safe Food Campaign in the RCGM, which led to my eventual combination of activist and researcher roles. I have been involved as an activist in providing evidence in the RCGM, but as a researcher have also been involved in critiquing the RCGM and analysing the processes for providing input into it. This combination of roles I refer to as the 'third space' of critical engagement, after the work of Homi Bhabha (1949). Paul Routledge (1996) describes this as

*. . . a place of invention and transformational encounters, a dynamic in-between space that is imbued with the traces, relays, ambivalences, ambiguities and contradictions, with the feelings and practices of both sites, to fashion something different, unexpected . . . It is about defining a politics that enables new radical alliances to evolve, creating an alternative geography of space, identity, and politics (p. 406-407).*

This level of involvement by a researcher is not unique in the social philosophies among people motivated to conduct research into social and/or environmental

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<sup>41</sup> Auckland is largest city and the financial capital of Aotearoa New Zealand approximately 126 kms drive from Hamilton (AA (Automotive Association), 2003).

phenomena. Robin Kearns (1991) suggests that social-justice is often an over-riding motive for geographers who ask questions about places and peoples after observing that ‘not all groups experience equal opportunities . . . the adoption of this set of values inevitably leads to choice of topic and inquiries’ (p.2). The history of this cross-over space between academia and activism is evident in feminist research. This is encapsulated in the feminist phrase ‘the personal is the political’, highlighting that feminist research is not just about describing injustice but overcoming it (McDowell,1992; Routledge, 1996). This idea is taken further by bell hooks<sup>42</sup>. (1991) by proposing that all research *should* be linked to progressive radical cultural politics while Ian Maxey (1999), in line with the approach taken in this thesis (see Chapter Two), sees all research as ‘activism’ as people are constantly involved in constructing their social reality. He states that “‘activism’ is a daily reality for us all. Each of us reading this article is already engaged in producing the social world’ (p.206).

Such a position is a rejection of modernist, positivistic thinking (Berg & Mansvelt, 2000; England, 1994). This ‘situated’ stance goes against assumptions of objectivity, impartiality, distanced disembodied knowledge and the dichotomy between subject and object. Seeking an objective stance of qualitative social research is seen as oxymoronic as qualitative research seeks to involve social interactions (Dowling, 2000; Oakley, 1981a). To present oneself as neutral and objective to the subject matter is seen as most likely impossible or even false (Dowling, 2000; and Oakley, 1981a respectively). ‘We do not parachute into the field with empty heads and a few pencils or a tape-recorder in our pockets ready to record the ‘facts’’ (England, 1994, p. 84).

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<sup>42</sup>. The author chooses not to capitalise the first letters of her name (see hooks, 1991).

Instead knowledge is seen as marked by its origins—'grounded' in the particular places and spaces in which it was produced (Berg & Mansvelt, 2000; Haraway, 1991; Harding, 1991; and Rose, 1997). To reject objective disembodied universal knowledge in favour of situated knowledges means we must locate ourselves as the researcher in the research and in our text. This is referred to as positionality. Rather than attempting to transcend our historical, social and personal worlds<sup>43</sup>. and seeking to write ourselves *out* of the text, we write ourselves *into* the text. It follows that instead of writing in the third person we become embodied in the text by writing in the first person (Berg & Mansvelt, 2000; Bondi & Domosh, 1992; and Hughes, 2002). I have taken this position choosing to write myself into this thesis.

The researcher's background and the 'worlds' s/he inhabits are thus acknowledged as part of the research process. (My background and the worlds I inhabit will be discussed in the section on the interviews.) One of the most common places for discussion of the interviewer's influence on the research is in regard to the interviewing process. The aim of this reflection by the researcher is to produce more inclusive methods sensitive to the power relations in fieldwork (Avis, 2002; England, 1994; Ramazanoglu & Holland, 2002; and McDowell, 1992). Exploring the dynamics between the researcher and the research in this way is referred to as reflexivity.

The importance of this discussion is twofold. Firstly, it involves addressing the 'multiple, provisional, and contextualized nature of meaning and behaviour' (McDowell, 1992, p.62). This involves challenging the assumption that knowledge is

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<sup>43</sup>. 'Geographers inspired by the humanistic tradition have recognised that people inhabit not one but many geographic worlds' (Kearns, 1991, p.2).

separate from language, a neutral medium through which knowledge is unproblematically symbolised and conveyed (Bondi & Domosh, 1992, see also Chapter Two). Secondly, it follows that due to the active role of discourse in knowledge construction the subjective engagement of the researcher should be acknowledged and explored as integral within the research (McDowell, 1992). Before discussing my positionality in this research I will briefly address the advantages and challenges of occupying this position of third space.

### **3.3.1.1 Advantages and Challenges of this Approach**

The main advantage of my involvement in the issue as an activist has been the perpetual flow of information I have had access to, as my research informed my activism and my activism informed my research. I have gained a depth of knowledge through this exchange that should be reflected in the depth of my analysis. In occupying the third space in addition to my formal contact I have also been in contact informally and socially with members of the environmental groups. This has allowed me to share information, gain contacts, and keep up-to-date with developments involving these groups.

I believe that my position as an activist is likely to have contributed to the trust I gained with my interviewees. This may be reflected in a number of interviewees agreeing to have interviews with me and trusting me to keep their identities anonymous,<sup>44</sup> and in

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<sup>44</sup>. Anonymity was offered to all interviewees, and the option was stated on the consent forms. A copy of the researcher's and participants' consent forms can be found in Appendices three and four respectively.

having gained interviews with people who turned down similar requests with researchers with whom they were not familiar. The level of candour and confidence my interviewees expressed in me has been humbling as interviewees invited me into their homes, shared food with me, shared details with me that involved turning off the recorder to make comments 'off the record', and for their openness and generosity I am very grateful.

There are however also challenges to this level of involvement and such an approach. I am aware that being privileged to this level of information by environmental activists means that I could unwittingly disclose too much tactical information in my thesis—putting the environmental groups in a vulnerable position. I am accordingly aware of my position of responsibility—and this was a point a number of interviewees stressed. I am also aware that this level of involvement may make critique of the environmental groups and their tactics challenging and may encourage re-description of environmentalists perspectives rather than critical deconstruction of them.

A further disadvantage in developing a study through such involvement is the time lapse between the RCGM hearings and my next set of interviews. It was necessary for me to research a new proposal, which meant a period of working out what my research issues were before submitting my revised research proposal. The post-RCGM set of interviews (face-to-face and e-mail) were conducted in order to follow up environmental contacts whom I had not interviewed while at the RCGM and to talk with Life Science representatives. At this point I made enquires about who had been involved in the various submissions of the Life Science organisations.

It proved very difficult for me to find Life Science representatives to talk to. This was due in part to their different structures—many of the companies I approached had people who lived overseas writing the submissions. Some people I spoke with were not particularly helpful. This could be due to the larger company structures and/or to the time lapse between the RCGM and my approaches, and there is of course the possibility that my involvement in the RCGM may have dissuaded potential interviewees from talking to me. Despite these challenges I did gain an e-mail interview with the Public Relations Manager of Monsanto New Zealand, who had written Monsanto New Zealand's submission and was living overseas at the time of our contact. I could not gain interviews despite repeated approaches to several people at Aventis CropScience and Dupont New Zealand, and none of these companies were able, or possibly willing, to provide me with contact information for the New Zealand Life Sciences Network (NZLSN). Fortunately my focus concentrates on the marginalisation of public input and therefore the responses from more bioproponents, while possibly providing additional insights, were not fundamental to the core of this approach.

Similarly the time delay between the RCGM and second set of interviews and e-mail interviews may mean that details were not so fresh in interviewees' minds compared to interviewing them at the time of the RCGM. However, on this point I found the interviewees were able to offer very full accounts of their experiences despite approximately four months having passed.

### 3.4 The Interviews

I conducted interviews with members of relevant organisations (see Table 3.1: Interviewees) to obtain information and insights. As all the groups had substantial submissions to the RCGM on their perspectives regarding GE the interviews were used mostly for insights into how the groups, and the representatives I talked to, experienced the RCGM processes, the procedures they followed and for background information on the groups. Findings from these interviews are thus mainly found in the general discussions on the RCGM (Chapter 1), and in examining the issues surrounding IPs (Chapter 4). They are also ‘peppered’ throughout the text chapters where I deconstruct the tropes that are embedded in the discourse (Chapters 6-8).

Interviews are a common and powerful tool we can use to try to understand others (Fontana & Frey, 1998) and are a popular method in human geography (Kearns, 1991). To find potential interviewees I utilised both purposive and snowballing sampling techniques. Purposive sampling involves the researcher identifying people s/he believes will provide insights relevant to the research. Snowballing on the other hand, involves interviewees recommending possible respondents to the researcher (Sarantakos, 1993). Together these techniques enabled me to approach identifiable likely respondents and gain access to those who may have been more difficult to contact through conventional channels.

**Table 3.1: Interviewees**

- **Susie Lees**  
Co-ordinator Nelson GE Free Awareness Group and  
Acting National co-ordinator GE Free New Zealand
  - **Mary-Ann Howard-Clark**  
Founding member of GE Free New Zealand  
Founding member of Safe Food Campaign
- Anonymous interviewees
- **K**
  - **B**
  - **Z**
- **Wendy Johnston**  
GE Free Waiheke Island  
Friends of the Earth
  - **Pam Duncan-Taylor**  
GE Free Waiheke Island
  - **Bruce Bisset**  
Chairman, Waiheke Island Community Board.
  - **Guy Hatchard**  
The Natural Law Party
  - **Jessica Hutchings**  
Nga Wahine Tiaki o Te Ao (Māori Women's group)
  - **Sue Kedgley M.P**  
Founding member of Safe Food Campaign  
Green Party of Aotearoa New Zealand Member of Parliament
  - **Denys Trussel (with Jon Whyte)**  
Friends of the Earth
- E-mail interviews with follow up e-mails with
- **Berylla<sup>45</sup>**  
Environment and Conservation Organisations of New Zealand
  - **Brian Arnst**  
Monsanto New Zealand Ltd

<sup>45</sup>. Berylla is the interviewee's complete name.

Having already identified the groups (see below) I wished to study in regards to my earlier focus on GE food and globalisation I used a variety of sources of information to track down potential interviewees. I contacted people I had meet through my previous involvement in the Green Party of Aotearoa New Zealand. There is a great overlap among the environmental groups in Aotearoa New Zealand as described below, and I was aware of a number of people's positions in other environmental organisations. It was also through my contacts in the Greens that I became involved in the Safe Food Campaign.

Some of these contacts were also further established at the Soil and Health Association of New Zealand National Conference when I presented a paper on my research 'Is Genetic Engineering a Biotech(revolution)?' (Rogers-Hayden, 2000). I had become aware of this conference due to my involvement in the local branch of the Soil and Health Association, which is an organics network. It was therefore my involvement in the Greens, Soil and Health Association, and Safe Food Campaign, and my academic work, that led me to many of my initial contacts. A smaller number of contacts were found through the literature produced by these groups, including their various e-mail newsletters. I also gained contact names from press releases and media reports. Initial contact with these potential interviewees was made by an introductory e-mail letter<sup>46</sup>.

However, a significant number of my interviewees were identified through snowballing. During my initial investigation into GE food and globalisation I was kindly taken around Waiheke Island by Wendy Johnston and introduced to key figures

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<sup>46</sup>. These letters introduced: me, the study, and the areas I wished to discuss. As they were highly individualised I have not provided one in the Appendices.

in the GE-Free Waiheke Island development. Serendipity played a larger role as my research progressed. A number of interviewees suggested co-workers, some others offered to talk to me when I met them at the RCGM, and people invited me to join them for lunch with others—this was one of my most successful (non)strategies for finding interviewees while at the RCGM. In total I held 13 face-to-face interviews and two e-mail interviews. The latter were necessary as I had not included the Environment Conservation Organisations of New Zealand (ECO) in my initial study, nor the bioproponents. Distance made face-to-face interviews unworkable in these circumstances as Berylla (from ECO) is based in Nelson while Brian Arnst (from Monsanto) was in Australia and relocating to Asia.

One-on-one interviews were used. These were semi-structured in-depth interviews. I did not seek uniformity, and did not therefore keep to a strict order of questions, delivered in a uniform manner. However, I did still have a number of questions within general themes to cover during the interviews so my interviews were not lacking structure. In-depth interviews are known for proving a richness of material, as the researcher is able to probe interviewees for clarification of points (Denzin & Lincoln, 1998; Dunn, 2000; Fontana & Frey, 1998; Sarantakos, 1993).

The semi-structured nature of the interviews means that every interview was unique, as each one was built on the interaction between the interviewee and me rather than a constant movement along a set of questions. This is in keeping with the premise of this research that no assessments are value free (see Guba & Lincoln, 1994). Politics cannot be separated from investigations (see Sarantakos, 1993). Moreover, as

mentioned above, I do not believe it is possible nor desirable to separate the influence of the researcher from the research, as incorporating the influence of politics on the research can result in flexible, revealing, research.

Intersections between personal opinions and characteristics in the research are referred to as subjectivity (Dowling, 2000). Research therefore is an interpretation of events and this depends greatly on the interviewer's characteristics (Dowling, 2000; Schoenberger, 1992). This is the influence of the researcher on the study, and it also is important in creating the research environment—such as establishing a rapport with interviewees. The researcher's positionality such as being an 'insider' (similar to respondents) or 'outsider' (different from respondents) influences this (Dowling, 2000; Haraway, 1991; Maxey, 1999; Rose, 1997). However people have many characteristics so a researcher is not simply an insider or an outsider. Researchers find commonalities with interviewees (see Oakley, 1981b) as researchers and interviewees have overlapping characteristics such as ethnicity, education, gender and so forth (Dowling, 2000; Haraway, 1991; Maxey, 1999; Rose 1997). Maxey (1999) proposes in the vein of Foucault (1980) and some feminist geographers, like Judith Butler (1990) and Gillian Rose (1997), 'that our identities are performative, which means there is no fixed or given self-consciousness of which we can ever be fully aware' ( p.202).

In my research I had a significant 'insider' role. Like all my interviewees concerning the RCGM I am involved in activism regarding GE.<sup>47</sup> Furthermore, although my interviewees were both female and male (approximately half each) of mixed ages

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<sup>47</sup>. In keeping with the theoretical orientation of this research I also view the bioproponents as activists, although in this case I am only referring to the environmentalists I had face-to face interviews with.

(generally older than myself), and a variety of ethnicities, the similarities between us always seemed prominent. Like the majority of my interviewees I occupy a 'privileged' position(s) in society being Pakeha<sup>48</sup> and tertiary educated. There were aspects of my role that were also 'outsider' such as coming from Hamilton, and using my information from the interviews on GE and the RCGM for academic purposes.

The positionality of the researcher therefore influences the research as shared meanings are created through the interaction—this is referred to as intersubjectivity (Dowling, 2000). Intersubjectivity means that the practice of the research is dialectical and it shapes and is shaped by the research through a reflexive process. As Norman Denzin and Yvonna Lincoln (1998) state, the interview is

*. . . not a neutral tool, for the interviewer creates the reality of the interview situation. In this situation answers are given. Thus the interview produces situated understandings grounded in specific interactional episodes (p. 36).*

It follows that neither the interviewer nor the interviewees remain unchanged during the research project due to intersubjectivity in the interactions (Dowling, 2000). I realise that in studying issues related to genetic engineering I have increased my knowledge of organics and over the period of this study my commitment to organics has grown. I found the interviews with the environmentalists enjoyable and affirming in addition to being very informative.

All the interviews took between one and two hours, and were conducted in interviewees' workplaces, homes, or in cafes. These were all (audio) recorded and later transcribed.

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<sup>48</sup>. Pakeha is the common term used to describe New Zealander's of European, usually Anglo/Saxon, descent. The word is of Māori origin, and describes the statistical majority of New Zealanders.

### 3.5 The Groups

Most of the interviewees belonged to the groups that had made submissions and provided witness briefs that I deconstructed. The groups were four bioproponent and six environmental groups. All of these groups were formally recognised by the Commission as Interested Persons (see Table 3.2) having gained such status through the process described in Chapter Four.

I chose to have a focused approach by selecting only the environmental groups and the bioproponents out of the variety of groups<sup>49</sup> that presented evidence to the RCGM. My choice was influenced by the interrelated history of the development of the RCGM, the groups' prominence in the RCGM, and their consequential polarisation. As mentioned in Chapter One, it was the critiques by the environmentalists, and the newly found political power of the Greens that led to the RCGM, while the New Zealand Life Science Network was specifically formed prior to the RCGM in order to lobby for GE. A great deal of the NZLSN's efforts were directed at countering these high-profile environmentalist concerns. In addition, my selection of groups was influenced by my previous research question as I was interviewing environmentalists for this research during the onset of the RCGM. Hence I had already arranged to interview many of the environmentalists regarding their actions and strategies concerning GE food.

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<sup>49</sup>. There were 117 groups which included many businesses, religious organisations and non-profit groups (see RCGM, 2000a for a list of the groups initially granted IP status and RCGM, 2000b for the supplementary list).

**Table 3.2: The Groups**

<b>Bioproponents</b>	<b>Environmental Groups</b>
<p><b>Aventis CropScience;</b> A biotechnology company that develops seed and herbicide products for the global market (such as herbicide resistant StarLink). Part of the transnational Aventis chemical and pharmaceutical group.</p>	<p><b>Environment and Conservation Organisations of New Zealand (E.C.O.);</b> An umbrella organisation focusing on environmental preservation and management.</p>
<p><b>Dupont New Zealand;</b> A multi-faceted transnational company with a section dedicated to agricultural biotechnology in New Zealand.</p>	<p><b>Friends of the Earth (New Zealand ) Ltd (F.o.E.);</b> An environmental group that is part of the international F.o.E organisation.</p>
<p><b>Monsanto New Zealand Ltd;</b> Part of the transnational biotechnology research and development Monsanto company. Its products include Roundup-ready herbicide resistant crops.</p>	<p><b>GE Free New Zealand (Revolt Against Genetic Engineering in food and the environment Incorporated – R.A.G.E.);</b> An umbrella organisation formed to address GM.</p>
<p><b>New Zealand Life Sciences Network (NZLSN);</b> An umbrella group promoting GE. Formed approximately six months before the RCGM. Its membership includes approximately 480 individual scientists and many organisations (26 of which gained IP status).</p>	<p><b>The Green Party of Aotearoa New Zealand (the Greens);</b> An environmental political party;</p>
	<p><b>Greenpeace New Zealand (Inc.);</b> A national environmental group that is part of the international Greenpeace organisation.</p>
	<p><b>Nelson GE Free Awareness Group</b> A group specially formed to address the needs and views of residents of the Nelson area.</p>

The environmental groups selected were the four largest, most prominent in addressing GE at a national level, and one group with a local focus. I also selected the Green Party of Aotearoa New Zealand as, even though it is a political party, it is also an environmental group. I felt that its centrality to the GE debate, and role in encouraging a Royal Commission, made its inclusion desirable.

It is worth noting that the groups were not mutually exclusive either as groups or in individual membership. ECO, for example, represented 63 groups, including Friends of the Earth and Greenpeace New Zealand. Similarly, GE-Free New Zealand was established as an umbrella organisation and its membership also included Friends of the Earth and Greenpeace New Zealand, as well as the Nelson Environment Centre from which the Nelson GE Free Awareness Group developed. The environmental groups demonstrated a high level of co-operation during the RCGM process, with volunteers working long hours to meet deadlines, and some groups sharing witnesses (see Appendix 2). It is possible that this co-operation led to submissions that were not mutually exclusive in authorship.

The selection of bioproponents included the one lobby group for GE, and the companies that were clearly identifiable as involved in GE seed and crop development. These three groups have bases in Aotearoa New Zealand and belong to transnational companies. Although these groups did not submit duplicate witness briefs like the environmental groups, they did similarly share witnesses and display close collaboration with each other.

### 3.6 Deconstruction in Action

As mentioned, I downloaded the submissions and witness briefs from the Commissions' website (<http://www.gmcommission.govt.nz>). I then read through these 1252 pages (see Appendix 2) many times looking for narrative themes. I highlighted narrative themes in various colours as I read noting summarised terms, such as 'science against science' and 'Progress', in the margins of the texts. After several close readings of the texts I had numerous themes, some overlapping, some that related to larger tropes, and some that contrasted each other. I then set about constructing categories for what appeared to be significant summarising narrative themes—collapsing sub themes within these and allocated a code (letter) to each. For example, sustainability was identified by the code 'C' (see Table 3.3).

I then constructed a spreadsheet for each group using the Microsoft Excel computer program. In these I noted the page numbers on which the themes occurred, identifying key words that appeared in the narratives. For example, in the spreadsheet for GE-Free New Zealand under 'D' (precautionary principle) I entered '= organic' to show that this group presents organic agriculture as the precautionary principle in action.

**Table 3.3 Initial Narrative Themes**

<b>Letter code</b>	<b>Theme</b>
A	Holism
B	Science caused the damage
C	Sustainability
D	Precautionary principle
E	Science not independent
F	Values/morals/ethics/democracy
G	Māori
H	Against nature
I	GE denigrates science
J	Science is male
K	Facts versus values
L	Scientific examples
M	Science is truth
N	Science is special
O	Need more science
P	Progress
Q	Scientist as witness
R	Non-scientist as witness
S	Notes

These spreadsheets were used as indices to the themes I was interested in. Using them I was able to easily turn to themes, such as quickly identifying each page of each submission that mentioned the precautionary principle (PP) with keywords to each reference on hand. This assisted me in being able to handle this quantity of data. I then analysed how the narrative themes were interrelated and eventually constructed these narrative themes into tropes.

The final product that appears in this thesis has been re-organised several times from the tropes in the RCGM. Of importance in the form of the tropes is the intertextuality of the

submissions, witness briefs and the RCGM report. Intertextuality ‘refers to the condition whereby all communicative events draw on earlier events’ (Phillips & Jorgensen, 2002, p.73). Obviously the submissions and witness briefs form an intertextual chain with the RCGM report, as elements of these texts are incorporated within the text of the report. Yet more notable is that the submissions and witness briefs from the bioproponents and the environmental groups refer to previous texts by each other. Hence, the tropes can be seen as being used to argue against other tropes—against a previous text. Michel Petit (2000) describes this approach as consistent with that of the French philosopher Gaston Bachelard. He suggests that as such ‘. . . any discourse is really conceived as written against another previous discourse, viewed as inferior, mistaken, in some important way . . . .’ (Petit, 2000, p.477). In order to map out the narratives I have found it useful to present the environmental groups’ tropes in one section but break up the bioproponents tropes into two sections, as presented diagrammatically in Figure 3.4. It means that the tropes unfold like an argument.

The bioproponents’ discourse, shown in brown,<sup>50</sup> is intersected by the green section, representing the environmental groups’ tropes. The next section in this progression is a mustard coloured section representing the Commissioners’ findings. Within this diagram the development of the Commissioners’ findings can be seen as influenced by the RCGM forum.

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<sup>50</sup>. The colour brown is commonly used to represent modernist thought in a similar way to the use of the colour green to represent environmental philosophy.

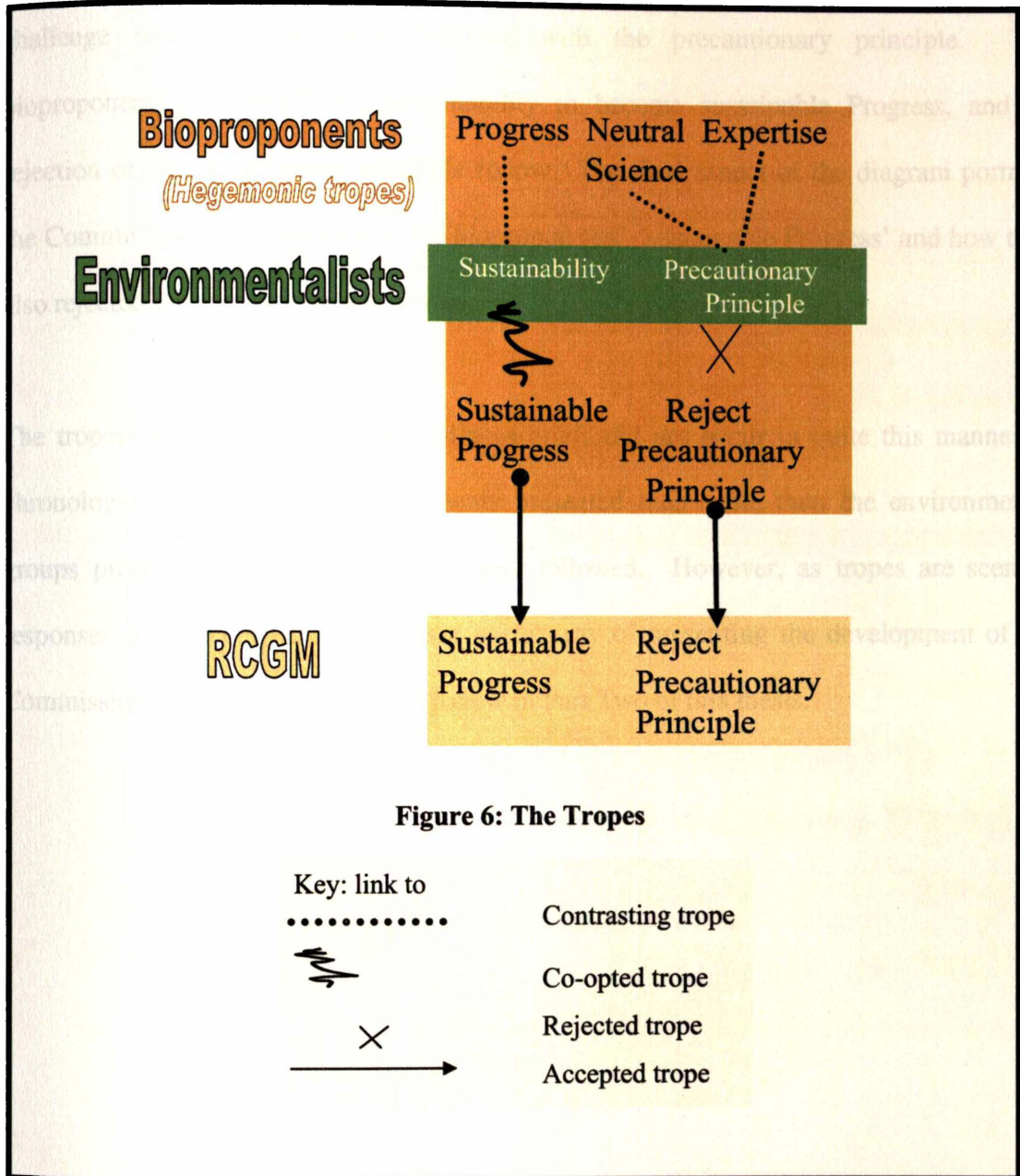


Figure 3.4: The Tropes

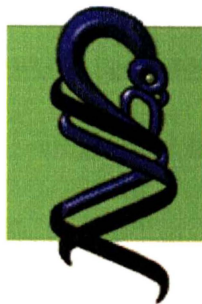
The bioproponents' tropes on Progress, neutral science, and expertise can be seen as shaped by the environmentalist arguments which reject Progress for sustainability and challenge neutral science and expertise with the precautionary principle. The bioproponents' co-optation of sustainability to become sustainable Progress, and its rejection of the precautionary principle follow. The final aspect of the diagram portrays the Commissioners' acceptance of the bioproponents' 'sustainable Progress' and how they also rejected the precautionary principle.

The tropes in the submissions and witness briefs did not occur in quite this manner in chronological time, as the bioproponents presented their case, then the environmental groups presented their case and the report followed. However, as tropes are seen as responses, I believe such a model is a useful way of presenting the development of the Commissioners' findings which will follow in Part Two of this thesis.

## PART 2:

# THE RCGM'S DISCOURSE

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**Figure Part 2.1: 'Symbol of the RCGM'**

Source: The Royal Commission on Genetic Modification (2003).<sup>51</sup>

*What previously appeared 'functional' and 'rational' now becomes and appears to be a threat to life, and therefore produces and legitimates dysfunctionality and irrationality.*

(Beck, 1996a, p.34).

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<sup>51</sup> This is the symbol of the RCGM. On the RCGM website it is stated that 'The protective Manaia [carved figure] incorporating the double helix as its backbone, represents ancestral guardianship and the application of wisdom in care and direction for the future'. Many Māori were outraged at the 'modification' of one of their Manaia (Jacqui Amohanga, personal communication, 2001).

## PART 2 Subsection 1:

# The Social Practice and Discursive Field of the RCGM

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This chapter is the first of five chapters that together examine the discourse of the Royal Commission on Genetic Modification. The first two chapters cover the social practice—the social and historical context—and the discursive field—the production and consumption of text—of the RCGM, while the following three chapters deconstruct the tropes found within the RCGM debate.

The social practice and the discursive field of the RCGM are described in two chapters, but not neatly as a chapter on each. Instead, the chapters are based on the explorations of modernity's hegemonic influences and possible challenges to this evidenced in the RCGM forum. The next chapter, Chapter Four, combines the social practice of the RCGM and its discursive field addressing influences of modernity, through science and law, and their effects on the RCGM. The second chapter of this pair, Chapter Five, will explore the other side to the social and historical context of the RCGM, which is the possible challenge to modernity through environmentalism.

## 4

## MODERNITY'S RATIONALE

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In the previous chapter I argued that power relations in the RCGM can be analysed through using a critical discourse analysis approach to examine the negotiation of the boundaries of science. In this chapter I argue that part of this analysis involves tracing issues around the processes of the RCGM to modernity. To describe the rationale of modernity and its effects on the RCGM debate I will begin by briefly outlining the development of modern science as the embodiment of rationality, and its effects on public debate including the resultant scientification of society through law. I will then relate this to the RCGM, discussing the effects apparent in issues relating to Interested Persons, thus analysing how the hegemony of modernity influenced the production and consumption of the Interested Persons' input into the RCGM, thereby affecting the RCGM as a forum for debate.

## 4.1 The Rise of Rationality

In order to discuss the rationality of science it is necessary to outline its rise to the position of the highest form of knowledge and the consequential de-valuing of other knowledge systems. Sal Restivo (1995), amongst others, relates how the scientific revolution—based on the oppression of women, minorities and labourers, and the exploitation of human and nonhuman ‘resources’—developed from social and cultural circumstances. It was not an independent project but rather the system of knowledge was intimately related to power structures found in politics, commerce, and the military, as it still is today. Thus, the scientific revolution was not just an intellectual revolution but was also an organisational and institutional revolution, a point Restivo believes is not widely understood. Harding (1996) describes the relationship between knowledge and institutional power as the ‘order of society’ (p.15). Modernist principles that form the implicit assumptions of what appears as ‘natural’ and ‘given’ have been widely disseminated and adopted in society, and therefore can be considered hegemonic. As Max Oelschlaeger (1991) states: ‘Modernism, dressed in myriad guises, has framed the principal (sic) categories that define our existence’ (p. 95). Other ways of knowing have been marginalised, and continue to be marginalised today through many forms of power/knowledge relations.

Analysis of dualisms can help elucidate the transformation of society during the Enlightenment and its influences on the structures of knowledge. The Enlightenment separation of ‘man’ from nature was a separation of everything ‘rational’ from nature.

Male culture was seen as distinct and superior to 'mother nature', thus entrenching dualisms of science that upheld the superiority of objectivity over subjectivity, fact over value, expert over layperson, linear over cyclic. The undersides of these dualisms were all seen as relating to nature. Culture became self—othering all else, culture was the object while nature became the subject. Culture was presented as superior to nature, as master and nature as the slave, as active rather than passive, as progressive rather than primitive, as civilised rather than wild and as human rather than animal. The undersides that represent nature were feminised. For example nature was seen as female, as wild, irrational, passive, less than human (animal), subject and other (see Merchant 1996; Plumwood, 1993; and Shiva, 1994).

Merchant (1996) traces her discussion back to the loss of the organic, within which the longstanding connection between women and nature was corrupted. The organic notion of nature saw her both as a mother figure who provided for humanity as well as the wild female who brought hazards such as storms and floods. The loss of the first image and consequential strengthening of the second was connected to the scientific revolution and the idea of exerting control over disordered nature.

*Two new ideas, those of mechanism and of the domination and mastery of nature, became core concepts of the modern world . . . The change in controlling imagery was directly related to changes in human attitudes and behavior toward the earth (Merchant, 1996, p.77).*

One of the influential figures in this re-ordering of nature was Francis Bacon (1561-1626) who was considered the 'father of modern science' (Merchant, 1996; Ramazanoglu, & Holland, 2002; Shiva, 1996). It was the creation of dualisms like those between women

and men, and nature and culture, that were central both to his experimental method and the masculine project. Shiva (1996) details the relationship between Bacon's scientific method and patriarchy:

*His was not a 'neutral,' 'objective,' 'scientific' method—it was a masculine mode of aggression against nature and domination over women . . . both nature and enquiry appear conceptualized in ways modeled on rape and torture—man's most violent and misogynous relationships with women—and this modeling is advanced as reason to value science. According to Bacon:*

*The nature of things betrays itself more readily under vexations of art than in its natural freedom. The discipline of scientific knowledge and the mechanical inventions it leads to do not merely exert a gentle guidance over nature's course; they have the power to conquer and subdue her, to shake her to her foundations (cited in Shiva, 1996, p.68).*

The rise of science and the devaluing of women's knowledge is believed to be no coincidence. Peter Hay (2002) notes that the 'father' of modern science, Bacon, may have been involved in the witch-hunts of Europe. The witch-hunts involved a displacement of women as healers with traditional knowledge by male professional medics with their western scientific knowledge.<sup>52</sup>

This elevation of man to superior to and superior from nature enabled forms of exploitation of nature that would not be conceivable if man and nature were seen as an interdependent whole. The scientific mechanist view of nature worked with capitalism, overturning previous cultural constraints against environmental exploitation, and aiding in

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<sup>52</sup>. By linking the development of modern science with the witch-hunts I am not meaning to imply that the relationship between Judaeo-Christianity and science was always harmonious. Indeed Enlightenment can be seen as overthrowing the earlier hegemony of religious dogma. This is implied in the word 'enlightenment', highlighting the freedom from the 'dark ages' of being unable to question. Thus the scientific revolution can be seen as a liberation from 'ecclesiastical domination' (Attfield, 1996; Herrick, 2001; Kneen 1989). Brewster Kneen (1989) suggests however that the outcome was that '[a] compromise was worked out to the apparent benefit of both science and religion' (p.131).

the legitimisation of private property (Merchant, 1996; Plumwood, 1993). This was possible by viewing nature as passive, inert, empty, without direction or value of its own—available for annexation (Merchant, 1996; Plumwood, 1993). Hence the dualisms that are integral to both language and ideology are the ‘instrumental logic of modernity’ (Plumwood, 1993). They are opposition and exclusion—domination and subordination. It is not possible to create a complete list of these because the variations are numerous and these dualisms are merely examples of a framework of modernist ideology. However, a number of key dualisms can be highlighted to elucidate their influence on modern thought (see Table 4.1).

**Table 4.1: Selected Common Dualisms**

Mind	Body
Culture	Nature
Men	Women
Rational	Emotional
Objectivity	Subjectivity
Fact	Value
Expert	Lay-person
Linear	Cyclic
Self	Other
Object	Subject
Master	Slave
Active	Passive
Progressive	Primitive
Civilised	Wild
Human	Animal
Public	Private

The separation of man from nature was a separation of everything rational from nature. Male culture was seen as distinct and superior to mother nature entrenching dualisms that

upheld the superiority of objectivity over subjectivity, fact over value, of the expert over the layperson, linear over cyclic.

#### 4.1.1 Science

The modern reductionist scientific method that developed is based on these dualisms. It is 'rational' not 'Romantic', 'objective' instead of 'subjective' and based on 'facts' not 'values'. It is reductionist rather than holistic, meaning that it relies on the concept that a complex system can be abstracted and comprehended through the isolation and analysis of an aspect of that system rather than viewing everything as belonging to an integrated system. The reductionist philosophy relies on the notion of objective disinterested scientists seeking solutions through accumulated knowledge. Science is accordingly seen as apolitical, separate from values and societal influences. Such notions of objective, value-free science as creating 'pure knowledge' are widely criticised in the social philosophies.

Shiva (1989) proposes that such a belief in an objective method, while giving the appearance of being a value-free method, means that an underlying, modernist, tradition is still used but is not recognised. Science is therefore seen, like all knowledges, as reflecting social and historical origins. Science is not value-free nor objective because the assumptions underlying it are 'set by the culture, politics and values of society' (Henwood & Pidgeon, 1995, p.8). The values of Enlightenment are inherent within science. For

example, as science is based on the separateness and superiority of culture over nature it reinforces and supports the anti-environmental status-quo (Seager, 1993).

One of the important works in portraying the dependence of science on culture is that of Thomas Kuhn (1970). His scholarship on paradigms elucidates how science is not open to all alternatives but confined within the current dominant paradigm. Discoveries not fitting with dominant thought will usually be thrown out, unless the alternatives cumulate in displacing the dominant paradigm (Kamminga, 1995; Shiva, 1989). Kamminga (1995) proposes that Kuhn's work discredits the ontology of science as paradigm shifts in science occur when what were thought to be reflections of reality (truths) are shown to be inadequate (not true).

Science is therefore is not an objective method free of societal influences but a culturally constructed system of knowledge that reproduces the dominant power structures. Scientific rationality is both embedded within culture, and conversely shapes culture (Feenberg, 1995). Steven Yearley (1988) states that numerous studies have shown connections between, for example, political, social and economic forces and the directions of science. Similarly, sociological analysis has also argued that scientists are not neutral observers with 'regrettable lapses from disinterestedness' but regularly engage in political manoeuvres, such as 'marketing', which are integral to their scientific inquiries (Gilbert & Mulkay, 1984). Martin Phillips and Tim Mighall (2000) elaborate on the theories of David Pepper (1984) to deconstruct the idea that science entails impartial observation. The authors suggest that the appeal to universal laws legitimates existing social conditions as

things are seen in terms of 'universal, unchanging, and unchangeable forces'. They also propose that science is linked to the interests of powerful groups as projects are often selected according to funding offered by industry to address its problems.

#### **4.1.2 Rationality and Narratives**

I argue that science is a socially embedded knowledge. However, conversely, it is its claim to rationality that is largely responsible for science having assumed the position of the highest form of knowledge. The reliance on the dualism 'fact'/'value' means that scientific discourses are seen as having superior objective rationality compared with other discourses (Hennen, 1995; Shiva, 1989). The rational is judged as superior to the Romantic leading to the marginalisation of all 'non-rational' discourses to the private sphere, thereby silencing them. As such, local and lay knowledges are seen as separate and inferior to scientific 'facts' and these lay knowledges are seen as separate, in accordance with reductionist method, from the social and historical context they developed from (Pottier, 1999).

Shiva (1989) proposes that the exclusion of 'non-scientific', in particular traditional, knowledges is threefold. Firstly, the ontology of science means that other properties remain unacknowledged. Secondly, the epistemology of science means that other ways of knowing are not acknowledged. Finally, she proposes that there is a sociological barrier that denies non-scientists both access to, and rights to judge, claims made by science.

*All this is the stuff of politics, not science. Picking **one** group of people (the specialists), who adopt **one** way of knowing the physical world (the reductionist), to find **one** set of properties in nature (the mechanistic) is a political, not a scientific mode (Shiva, 1989, p.30, emphasis in original).*

Accordingly, lay and traditional knowledges, culture, ethics and spirituality are viewed in opposition to rational science—as irrational and dismissible (Grove-White, Morris, Szerszynski, & Wynne, 1991). This has led to a gap between the publics and the ‘rational operations of the public sphere’. Science became entrenched as the discourse of public life in official and governmental texts, and instrumental in shaping society. The rational public discourses on environmental issues have shown a lack of attention to the way social and cultural values are part of the debate, encouraging a shift of public attention away from the human related activities that embody the environmental crisis (Grove-White & Szerszynski, 1992). Portraying environmental problems as objective physical problems means that ‘solutions’ are seen as consisting of technology, regulation, international treaties, and the application of economic tools (Grove-White, 1993).

### **4.1.3 Scientification of Law**

Modern sciences have therefore been influential in shaping society but this reorganisation of society could not have been achieved purely by science alone, and required law as the ‘surrogate scientization of life’ (Santos, 1995). Following in the tradition of Enlightenment, law replaced traditional modes of knowing with scientific like practice. Law’s power as derived from authoritative discourses (scripture, national epics, reservoir of

precedents), or 'natural law based on philosophical argument from an underlying moral order', was replaced (Luban, 1994, p.28). Law became scientific in its method, the organised institutionalised search for truthful data, which could go beyond multiplicity and difference, and thus share with science the prospect of complete knowledge (see Carty, 1990; Jasanoff, 1995; and Santos, 1995). Law became concerned with certainty, and like Descartes' scientific method of doubt, it became concerned with separating 'belief' from 'fact' (Patterson, 1994). In effect, the scientific rationality that underpinned law denied the existence of rationality in all other knowledge systems that did not follow these epistemological principles (Santos 1995, p.12). All issues of importance in the modern world were therefore seen as identifiable, having a logical cause and being solvable through rational means. In naturalising the epistemology of modernity, the search through law for the sole rational solution denies complexity, mysteriousness and multiplicity (Ashforth, 1990). As Peter Fitzpatrick (1990) states: 'Law comprehensively reflected and condensed Enlightenment thought in practice' (p.91). Law and science play a central role in issues of power/knowledge constituting modernist ideals as hegemonic. As such, they have played a significant role in Commissions, including the RCGM.

## **4.2 The RCGM**

Environmentalists' concerns, related to the influence of modernity, can be traced back to the beginning of the RCGM. Many who had been involved in calling for a Royal

Commission into GE questioned if they had done the right thing when the Commission's processes began to unfold. The appointment of the Commissioners, the nature of the investigation in being a Royal Commission rather than a Ministerial Inquiry, and the processes surrounding Interested Persons caused anxiety.

One of the central aspects of a Royal Commission is the ad hoc appointment of people with perceived expertise who are seen to possess impartiality and disinterestedness (Burton & Carlen, 1979). The extent of the discontent felt by some about the appointment of the Royal Commissioners on Genetic Modification can be gauged by Jeanette Fitzsimons M.P (2000), Co-leader of the Greens, who suggested a fifth member, an ecologist<sup>53</sup>, should be appointed. Furthermore, Environment Conservation Organisations of New Zealand initially contemplated boycotting the RCGM due to its perceived bias (Berylla, E-mail Interview, 2001).

A number of groups highlighted the lack of environmental or holistic foci in the backgrounds of the Commissioners. In collaboration with Hindmarsh (Rogers-Hayden & Hindmarsh, 2002), we analysed the composition of the Commission, and concluded that the backgrounds of the Commissioners were all in modernist embedded fields. We commented that three out of the four Commissioners had either legal or scientific

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<sup>53</sup> Ecologists are traditionally scientists, and thus this can be seen as a plea for science. However the significance of ecology is that it involves analysing the interactions between species, as mentioned in Chapter Two, and therefore provides a holistic approach. Klaus Eder (1996) describes how: 'Ecology' has become a catchword to be applied to every element in public discourse on the environment; to ethical questions, scientific theories, and to literary expressions of the relationship of man with nature' (p.207). 'Ecologist' therefore has become shorthand to describe a person with an appreciation of the interdependence of the ecosystem.

credentials, while the fourth commissioner was from the Anglican Church—an organisation that could be identified as possessing an anthropocentric position.<sup>54</sup> Therefore, although the credentials of the Commissioners did not necessarily determine their positions on GE, they were from backgrounds that generally rely on the ontology and epistemology of Enlightenment. This meant that any environmental inclinations the Commissioners held might tend towards reaffirmation of modernist ideals, being reformist (shallow green) rather than recognising the interconnectedness of ecosystems (deep green). In this sense the Commission was seen as biased, not necessarily in regards to a particular position on GE, but in terms of the worldviews of the Commissioners and the corresponding framework they were most likely to use to view and judge GE.

Related to this concern was the fear that as a Royal Commission the inquiry may become excessively judicial. This was of concern to some environmentalists, who expressed apprehension that the autonomy of the Royal Commission effectively protected it from critique. Sean Weaver (2001), Private Secretary to the Green Party of Aotearoa New Zealand Member of Parliament Sue Kedgley M.P, noted in a public talk that in making the inquiry a Royal Commission, rather than a Ministerial Inquiry, the rules and processes were not under the direction of the Minister concerned (Annette King Minister of the Environment) but instead had an established format. The preset procedures underpinning the Royal Commission facilitated the possibility of rationalising the consultation process, marginalising alternatives. The democratic nature of this was questioned, as the processes

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<sup>54</sup> This can be seen as reflected in the relationship between Christianity and the physical environment. According to Judaeo-Christian tradition, as mentioned previously, the natural environment is valued first for the resources it provides for humans rather than for its intrinsic value (See Peacocke & Hodgson, 1996).

unfolding around Interested Persons seemed very legalistic, leaving little room for flexibility to meet the particular situation's needs, and consequently some 'wondered if we had done the wrong thing wanting a Royal Commission' (Weaver, 2001a).

#### **4.2.1 Issues Related to 'Interested Persons'**

The most important feature of a Royal Commission is the oral evidence gathered from Interested Persons. This process is also the most contentious aspect of Royal Commissions, and the one issue around which many of the concerns about the RCGM revolved. Gaining IP status was important to many environmental groups as it was the only way a group could present oral evidence to the Commission and defend their evidence under cross-examination. Interested Persons status was also necessary in order to be eligible to cross-examine others and for the environmental groups to have the forum for challenging the bioproponents on perceived inconsistencies or differences of perspective in their evidence presented to the RCGM.

A number of problems exist, however, with cross-examination processes forming the key to Royal Commissions. Such processes reinforce the role of experts in technical decision-making (Fischer, 1999). Furthermore, cross-examination becomes a matter of 'winning' an argument, in the manner lawyers are trained to do; rather than reaching an outcome (Shapiro, 2002). Most importantly, cross-examination relies, to use Adam Ashforth's (1990) words, on the 'epistemic predilections of modernity'. Royal Commissions are

usually undertaken to investigate complex issues with social and political dimensions, while the cross-examination process relies on a reductionist worldview more suitable for researching technical details. Oral evidence presumes that political struggle can be transformed into reasoned argument, that through a rational approach a rational solution can be found (Ashforth, 1990; Beck, 1992a; Jasanoff, 1996).

#### 4.2.1.1 Selection of Interested Persons

Specific criticisms of the legalistic nature of the Royal Commission on Genetic Modification revolved around the selection processes of IPs and, for those groups that had been successful, the cross-examination and submission processes. The criteria for selection of Interested Persons were taken from the Commissions of Inquiry Act of 1908, (Royal Commission on Genetic Modification, 2002) even though it had not been invoked in recent Royal Commissions, such as that into the Erebus disaster<sup>55</sup>. (Weaver, 2001a). The contestation surrounding IPs was based on the notion that very few people within either the environmental groups or Commission staff, were able to define exactly what IP meant beyond the official statement from the Act. The Commission defined Interested Persons as those who had 'an interest in the Inquiry apart from any interest in common with the public' (Royal Commission on Genetic Modification, 2001c).

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<sup>55</sup>In reference to the 'Royal Commission to Inquire into the Crash on Mount Erebus, Antarctica of a DC10 Aircraft Operated by Air New Zealand Limited' (see Royal Commission to Inquire into the Crash on Mount Erebus, Antarctica of a DC10 Aircraft Operated by Air New Zealand Limited, 1981).

In an interview Annette Cotter (2001) of Greenpeace New Zealand summed up the feeling of numerous environmentalists on the announcement that there would be IP status: 'that's just completely bizarre because . . . aren't most NGOs representatives of the public?' Many environmentalists were concerned about trying to prove they were anything other than representatives of the public, and were puzzled as to how to go about such a declaration. Berylla (Email interview, 2001) from ECO said 'as there was no real description as to what an IP was, how could one prove one was one? How they were selected is still a mystery'. The lack of definition available meant that groups were applying for Interested Persons status while still having unresolved queries, such as whether they could apply for IP status if their parent body was also applying (Weaver, 2001). In invoking the 1908 Royal Commission Act to separate the 'experts' from the 'public' a potential barrier to consumer representative groups was established. 'Expertise' was presumably easier to establish for a group involved in GE than environmentalist groups representing the public's opposition to GE. Such a focus on 'expertise' also acts to discount 'lay knowledge' as being equally valid as expertise', reinforcing dominant scientific ideals of knowledge and the separation between 'opinion' and 'fact'.

Adding to the contestation over the definition of Interested Persons was that a number of those who wanted IP status missed out. This was due not only to the lack of definition but also the exclusion of individuals and the tight timeframe implemented. No individuals were given IP status irrespective of their background in relation to GE or the potential effects GE could have on their lives or livelihoods. They were all turned down and therefore had to either apply as 'public', and would only be able to present a written

submission to the Commission, or become involved in a group with IP status, in order to present oral evidence and become involved in the cross-examination processes. 'Expertise' was thus not just about having a special interest in GE but also belonging to an organisation that did. In addition, a number of groups, such as Save Animals from Exploitation (SAFE) and Physicians and Scientists for Responsible Genetics (PSRG), were at first denied IP status. However, after a public outcry an additional eight groups including these two were granted IP status.<sup>56</sup> There was concern not only that these groups had been initially rejected despite their obvious special interests in GE compared to the 'average person', but also that in the final list of IPs there was a much greater number of pro-GE groups than those who were known for their GE critiques (Weaver, 2001). Weaver (2001b) identified 63 groups known to be supportive of GE compared to 37 known to critical of GE out of the 113 IPs (the others were unknown to him at the time of him writing).

Within this IP selection process another of the problems faced by environmentalists were the timeframes. A period of approximately one week was given to groups to apply for IP status. For the environmental groups this provided an enormous barrier to participation, as many groups operate on strong democratic lines and were bound to consult with members before making an application on behalf of 'the group'. This was very difficult for groups with members scattered throughout the country and who infrequently meet in person or telephone conferenced. The timeframe had been created on the presumption of certain

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<sup>56</sup> The other groups were: Auckland Healthcare Services Ltd; Ministry for the Environment; New Zealand Institute of Patent Attorneys (Inc); Nga Wahine Tiaki o Te Ao; Te Runanga o Ngai Tahu; and Muaupoko Co-operative Society.

organisational structures of the groups likely to seek IP status, thus, disadvantaging those groups that worked on alternative structures in accordance with their non-dominant worldview. The timeline was too tight for some of these groups and they subsequently missed out on IP status and a chance to present cross-examinable evidence to the RCGM (Berylla, E-mail Interview, 2001; also Weaver, 2001a).

#### **4.2.1.2 Difficulties for Interested Persons**

Issues with timeframes continued throughout the RCGM process for those who had gained IP status. Interested Persons were required to prepare witness briefs, and contact international and national specialists, in the short period between August and the end of October 2000. Once again consultation with groups' members was difficult within the period allowed. For groups like ECO, that had contemplated boycotting the Commission process, the time available was even shorter. The Right Honourable Sir Thomas Eichelbaum suggested that groups should have been working on their submission as soon as they knew there would be a Commission. However, as discussed below, the template provided by the Commission meant this was not possible. The effect of the timeline on these groups meant that submissions were in some cases more general than intended as the groups relied on their founding documents because there was inadequate time to discuss particular issues with their members (E-mail Interview with Berylla, 2001). Similarly, the timeframes for submissions did not take consultation processes into account. Extra time

would have been necessary for some of the groups operating in ways that rely for example on the group consensus of the members.

The difficulties experienced by the environmental groups with regards to the timeline were mirrored in the legalistic nature of the cross-examination process. Environmentalists widely discussed how the bioproponents did not get the same degree of cross-examination as the environmental groups did from the bioproponents. The cross-examination process occurred at the time of the oral presentations for the IPs in Wellington (and briefly in Auckland). The environmental groups, with their small and restricted budgets and reliance on volunteer labour, contrasted with the multinational bioproponents and their lobby group the New Zealand Life Sciences Network (NZLSN). This meant that most environmental groups were unable to have someone present at all the hearings, and could not afford a lawyer to attend all of the bioproponents hearings and cross-examine on their behalf. Even with their extensive networking there was not always an environmental cross-examination organised for all the hearings (Interview with Susie Less, 2001; and also Interview with Annette Cotter, 2001). Annette Cotter (Interview, 2001) said 'for groups that have massive funding to be able to pay for people to be in at every single hearing, every single sitting, its achievable, but for groups that are scraping along trying to put together the resources which is all of the NGO sector, all of the GE-free sector, even the organics

sector, you just can't compete'..<sup>57</sup>. In comparison the Life Sciences were able to have a Queen's Counsel cross-examine on their behalf.

Part of the workload involved in the cross-examination process was analysing the submissions and witness briefs of the groups before hearings. This information was supposed to be placed on the RCGM website ten working days before the presentations. Often it was posted within only a few days of the corresponding hearing (Weaver, 2001b). Berylla (Email, Interview, 2001) stated that volunteers simply could not read all of this. Even for those working within environmental organisations the task was daunting. Weaver (2001a) commented that,

*a huge amount of submissions were posted either on the Commission website or sent out as emails. Hundreds and hundreds and hundreds of pages of submissions that we had to then try and read while we were trying to figure out the process, try and read and assimilate this stuff, try and pick out stuff for cross examining . . . it was basically an impossible process. I was completely and totally overwhelmed.*

In effect, the legalistic processes of the RCGM upheld modernist ideals and amplified the resource inequity among the polarised groups. The IP process failed to take into account the inequity among the groups. Instead the processes were based on the rationalistic assumption that issues can be viewed in isolation of one another. Political equity and ability to participate in the processes was seen as separate from material inequity. This rationalistic separation of reason from the production of reason (Plumwood, 2002), affected environmentalist input into the Commission and may ultimately have affected the outcomes of the RCGM. Sue Kedgley M.P (Interview, 2001), a Green Party of Aotearoa

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<sup>57</sup>. Hugh Campbell (2003) however, suggests that the organics sector was able to use a small group of emerging industry professionals to co-ordinate the week of presentations by the organics industry at the RCGM, and was thus able to 'stand out' among the anti-GE groups which relied mainly on volunteers.

New Zealand Member of Parliament and Safe Food Campaigner, said 'we did have a lot of reservations, especially at the beginning because the way the whole system functions it is a sort of David and Goliath situation . . . it's not a level playing field at all'.

#### **4.2.1.3 The Submission Template for Interested Persons**

The lack of a level playing field is further evident in the Interested Persons submission template (Royal Commission on Genetic Modification, 2000c; see Appendix 5). Although it was the same template for everyone, the issues facing the submitters regarding the template were very different for the bioproponents and the environmental groups. All IPs (groups and witnesses) were required to present their argument in a set format that consisted of responses to 16-questions. This template was to a large extent dictated by the terms of reference of the Commission. As such, unlike the Australian debate, there was scope for objecting to GE, and unlike the British GE forum (as noted in Chapter One), there was an invitation to discuss non-physical aspects of GE. For example, in one question, submitters were asked to identify: 'The main areas of public interest in genetic modification, genetically modified organisms, and products, including those related to . . . (iv) cultural and ethical concerns' (Royal Commission on Genetic Modification, 2000c).

Although the template invited broader debate than was invited in either the Australian or British debates, there were nevertheless obstacles to participation. All answers had to 'stand alone', meaning answers could not be cross-referenced. This 'parts approach' is

characteristic of modernity, as issues are portrayed as existing in isolation from one another. This is also consistent with the reductionist epistemology of modern science and was, therefore, a format accommodating of scientific responses. As such, it disadvantaged all IPs that did not hold this worldview but instead employed a holistic approach. The environmental groups generally found the template restricted them from contextualising their answers within their worldview, and from portraying the interconnectedness of the issues. Berylla (E-mail Interview, 2001) elucidates the difficulty ECO experienced:

*I think the way the Commission wanted information formatted into categories made it difficult to make a coherent submission, especially for groups like ECO, that were taking an ecosystems approach. We see everything as affecting everything else. We did not want to break down our responses into the categories they had designated.*

The template, therefore, although the same for all submitters, through its reductionist format, disadvantaged the environmental groups in their ability to voice their objection to GE. It appears that an alternative template in which groups could have developed an interconnected argument may have been a more effective way of eliciting environmentalist responses so that they could explain the assumptions and values underpinning their submissions.

#### 4.2.1.4 Summarising Submissions

Environmentalists' concerns about the reductionist methodology of 'stand alone' template answers were subsequently followed by apprehension that a reductionist approach would also be used for the commission's analysis of the submissions. Environmentalists were anxious about the possibility that summaries of their responses on each question would be given to the Commissioners to deliberate. The concern was that summaries would have oversimplified the diversity of opinions and ecological worldviews held amongst environmental groups.

The process that eventuated, although slightly different from that above, still tended to compromise and thus misrepresent environmental submissions. Although each IP submission was individually summarised, they were all collated into an IP report, which was used as a ' . . . working document to assist the Commissioners in their deliberations on evidence presented' (Royal Commission on Genetic Modification, 2001e). As both a qualitative and quantitative analysis of the submissions:

*The approach adopted for the summary and analysis of submissions by Interested Persons was therefore largely dictated by the format in which the evidence was presented (i.e., the specific Warrant items) and by the perceived requirements of the Commissioners (Royal Commission on Genetic Modification, 2001e).*

The result of this process was to further restrict the ability of some environmental groups to express their opposition to GE within their respective worldviews. This additionally compromised environmentalist arguments and perspectives.

### 4.3 Conclusions

I argue that modernist influences formed the social context, and shaped the discursive field, of the RCGM. Modernity's rational method of science and law can be seen upholding dominant dualist ideals and reproducing the status quo. They can be seen as hegemonic, 'naturalising' 'rational' processes and deactivating projects against them. As a method of public debate, rationality operates to marginalise alternative, holistic, lay and traditional ways of knowing. Hence, the instrumental logic of modernity operated as the discursive field of the RCGM, marginalising environmentalist input.

The appointment of Commissioners with modernist backgrounds was an early sign to some environmentalists of the possible perspective the RCGM may take. Similarly, the IP processes pointed to the way legal and scientific dominance was reinforced in the resulting processes. The IP selection process, in attempting to separate the 'experts' worthy of participating in the central process from the public, upheld the ideals of expertise characteristic of modernist structures of knowledge/power. This legalistic criterion of separating out those with an interest separate from the public was ambiguous for the environmental groups as representatives of some of the publics. Furthermore, the IP cross-examination process was based on the ontology and epistemology of modernity which organised systematic searches for 'the truth'. It acted to rationalise the political protest by privileging dispassionate 'factual' debate.

Integral in the difficulties of the IP process were the timeframes that privileged certain organisational structures by not accounting for possible diversity and the time these alternative processes may require. In doing so it disadvantaged these groups over those formed along more conventional worldviews. The template advantaged submissions written in narratives, in keeping with a modernist perspective, such as reductionist science, while disadvantaging those, such as environmentalist narratives, that were written from a holistic worldview.

The environmental groups were further disadvantaged by the Commission's working document format, which compressed a diverse range of environmental groups' objections to GE into a generalised summary. This further compromised, and misrepresented, the rich mosaic of environmentalist tropes. Together, the IP processes assumed modernist structures of knowledge, amplifying resource inequity. To enable anything other than a 'formal possibility' of participation the structures of participation and deliberation have to take into account the material conditions necessary for equal participation (Plumwood, 2002) and the conditions necessary for those with alternative worldviews to participate fully. I am not however meaning to imply that there is only one environmental perspective and that this is in a simple contrast to modernist rationality, and it is this issue I will explore in the following chapter.

## 5

CONTESTING MODERNITY

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In the previous chapter I argued that the central tenets of modernity shaped the RCGM. In this chapter I argue that there was a contrasting influence to that of modernity provided in the RCGM forum through environmentalism. Environmental issues and protests, such as those surrounding GE, exemplify second modernity in which society is confronted with the proposition that the systems and ideologies of modernity are no longer able to cope with the consequences of modernity. The modernist ideologies of unquestioned faith in Progress, science, and technology have led to increasingly environmentally threatening industrial production and inadequate critical facilities to address them (Beck, 1992a).

Environmental groups have emerged in opposition to Enlightenment legacies with modern environmentalism providing a (explicit and implicit) challenge to modernity. However, environmentalism, like the related concepts of sustainability and the precautionary principle that can be seen as initially challenging Enlightenment principles, is a contested concept and its oppositionality to modernity is complex.

Notions of what environmentalism is, and whether the related concepts of sustainability and the precautionary principle challenge Progress and faith in science and scientific expertise, are debated by the environmental groups and the bioproponents in the

RCGM and are thus central concepts to this thesis. This chapter therefore forms the second part of the social and historical context of the RCGM. I will begin by investigating environmentalism as a possible challenge to modernity, by firstly tracing its development.

## **5.1 Challenging Modernity Through Environmentalism?**

### **5.1.1 Pre-Environmental Sentiments—Romanticism**

Attempting to define the beginnings of environmentalism is problematic. However, its roots are often traced back to ‘pre-environmental’ sentiments (see Hay, 2002) found in Romanticism in the late eighteenth and early nineteenth centuries. Romanticism was a historical movement, which although it lacked an established philosophical core, underpinned the work of poets such as William Wordsworth and Samuel Coleridge. In effect it was a reaction against the new faith in Progress through rationality and modern science. The operating principle of Romanticism was formed through attempting to create a synthesis of ancient and modern in a system of self-reflection. In practice this meant that writers communicated in an indirect, imperfect, dialectical way, in which their works were not presented as the ‘final word’ but attempted to engage the readers in their creation (Jones, Natter & Schatzki, 1993).

Of particular relevance to this thesis is that Romanticism was related to a near rejection of the Enlightenment separation of humans from the physical environment (see Hay,

2002). These sentiments of Romanticism are found in modern environmentalism. However, whether Romanticism is the foundation for modern environmentalism or not is contested. Hay (2002) suggests that the evidence is mixed, with the environmental movement<sup>58</sup> working from non-Romantic values as it is based on holism rather than transcendent individualism, future focused rather than retrospective, based on ecosystem science as opposed to a 'nature study' and aesthetics, and focused on social and political change on a global scale, rather than nation-focused conservatism.

However, one of the features of Romanticism that is of importance to the environmentalisms explored in this thesis is the Romantic rejection of modernity, particularly with respect to the use of language to reject rationality. This is a central feature of this study of the debate over GE through the RCGM. The role of modernist ideals is also a key element in the exploration of contemporary environmentalism and it is to contemporary environmentalism that I will now turn.

### **5.1.2 Contemporary Environmentalism**

Contemporary environmentalism is thought to have its roots in the development of nature preservationism and conservationism in late nineteenth century U.S.A. (Gottlieb, 1995; Hay, 2002; Milbrath, 1984). The preservation movement is traced back to the nature Romantic John Muir, who believed nature was God's temple. God was

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<sup>58</sup>. The term 'environmental movement' is used to loosely describe the collective actions of those groups referred to in this thesis as 'environmental groups'. I do not mean to imply a homogeneous 'movement' all working towards the same goals in the same way. See Connelly and Smith (1999, pp.70-77) for a further discussion on the term environmental movement.

manifested in the wilderness, and preserving the wilderness was seen as necessary so people could go into it and appreciate the interconnectedness of all things. He saw nature as an organism, long before this was a popular environmental perspective, and was the founder of, the now international environmental group, the Sierra Club (Hay, 2002).

Conservationism is also traced back to developments around this period and is usually associated with Gifford Pinchot and Aldo Leopold. Pinchot is renowned for pioneering terms such as 'sustainable yield' in which the physical environment was seen as needing to be conserved for future human use—'wise-management' (Hay, 2002). Leopold was at one stage a 'disciple of Pinchot' but later disagreed with Pinchot on forestry matters, becoming U.S.A.'s leading wilderness campaigner in the 1930s (Hay, 2002). He is most widely known for his work *A Sand Country Almanac; With other Essays on Conservation from Round River* (Leopold, 1966 first printed in 1949) in which he ' . . . enlarges the boundaries of the community to include soils, waters, plants and animals or collectively: the land' (cited in Hay, 2002,p.15). While both the preservation and conservation movements were therefore concerned with the retention of wilderness, as God's temple or for future exploitation, neither challenged the status-quo as neither saw a fundamental clash existing between economic growth and environmentalism.

A change in environmentalism is said to have occurred in the 1960s and 1970s when environmental problems became seen as linked to technological and economic Progress. This is not to say that there was a moment when all environmentalism

changed, but rather that around this period a noteworthy awakening of consciousness occurred on a substantial scale (see Gottlieb, 1995). One of the significant events in facilitating this was the publication of Rachel Carson's *Silent Spring* (1963) (Guha, 2000; Hannigan, 1995; Hay, 2002), in which the so called green revolution.<sup>59</sup> pesticides were shown to be environmentally destructive leading to dwindling wild-life populations. This was important in showing the interconnectedness of the ecosystem (see Guha, 2000).

Another key development in this new environmentalism was anti-nuclear activism. Nuclear technology was seen to symbolise all of the problems of modern society. The nuclear issue highlighted the military-industrial complex, the culture of secrecy, and expert-domination, in addition to its potential danger to the environment and to human health (see Hajer, 1995). Adding to the creation of this new environmental consciousness was an awareness of problems with plastics, toxic waste incinerators, and chemical and nuclear disasters such as Love Canal and Three Mile Island. What occurred was a rejection, by increasing groups of people, of modernist tropes on Progress through economic growth (Hannigan, 1995). While John Hannigan (1995) proposes this led to a corresponding loss of faith in science, environmental groups still utilised science, often having their own issues represented by scientists. Hay (2002) suggests that the 1960s and 1970s environmentalism still relied on the naive belief that governments would change policies on the presentation of objective data about environmental problems.

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<sup>59</sup>. The 'green revolution' is the term used to describe the industrialisation of agriculture in the 1960s (for discussions of the effects of the green revolution see also Ingeborg Boyens, 1999; Busch, *et. al.*, 1995; Busch, 1997; Griffen, 1979; and Shiva, 1993).

Since the 1960s and 1970s environmentalism, which was once held to be a fringe movement, has become mainstream (Grove-White, 1993) and as Timothy O'Riordan (1989) states: 'In some respects environmental rhetoric is almost becoming too successful' (p.81). The power of environmentalism is lost when everyone (including polluting industries, and governments and their agencies) claims to be an environmentalist.

Among many reports, significant in environmentalism becoming part of the international policy agenda, there are two reports particularly relevant to this thesis. Firstly, in 1972 the Club of Rome's<sup>60</sup> publication *Limits to Growth*<sup>61</sup>. (Meadows, Meadows, Randers & Behrens, 1972) was released. The editors cautioned that unchecked production and consumption patterns would lead to disaster. A second development, a decade and a half later, was *Our Common Future* (World Commission on Environment and Development, 1987). This report is also known as 'the Brundtland report' as it is the findings on a UN Commission into sustainable development chaired by the then Norwegian Prime-Minister Gro Harlem Brundtland. Like *Limits to Growth* it contained a warning about Progress and its potentially catastrophic effects (Douma, 1996). However, the recommendation was not for radical change. Instead these reports call for resource use change, and are discussed further later in the thesis in regard to 'sustainability' (see Chapters Six to Nine).

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<sup>60</sup> . The Club of Rome is an international NGO think tank dedicated to bringing about change regarding what it calls the 'world problematique'. This refers to 'the complex set of the most crucial problems—political, social, economic, technological, environmental, psychological and cultural—facing humanity' (Club of Rome, 2003). Its membership includes heads of state and former heads of state along with scientists, economists, business people, and international high civil servants. For further information on the Club of Rome see Club of Rome, 2003.

<sup>61</sup> . This report can be seen as building upon sentiments expressed by the Reverend Thomas Robert Malthus (1766-1834) who proposed a principle of limits to growth. He espoused a theory that the population increases geometrically (2, 4, 8 and so on) thus doubling while subsistence increases arithmetically (1, 2, 3, and so on) thus failing to keep up (Malthus, 1989).

### 5.1.2.1 Environmental Commitments

This discussion is not meant to imply there is just one environmentalism, as over time and across space a multitude of environmentalisms have developed. Accordingly, it is necessary to describe what I mean by environmentalism, which is now a very popular identity, in order to help elucidate the differences between popular and more radical, contemporary approaches. This will lay the foundation from which to explore the environmental commitments espoused by the environmental groups, the RCGM, and the bioproponents, in the GE debate. As stated, there is not just one environmental movement, but rather a disparate collection of groups working for similar but not necessarily identical goals. However, unlike the term ‘environmental movement’, in which similar goals are sought, the environmental commitments discussed by biotechnology companies and groups such as Greenpeace New Zealand obviously contrast.

A number of approaches highlight substantial value differences underlying the environmental commitments claimed by various groups. These include the development by Riley Dunlap and Kent Van Liere (1978) of the influential dominant social paradigm (DSP) and the new environmental paradigm (NEP) model, Stephen Cotgrove’s (1982) social manipulation/personal transformation—value change/normative change model, O’Riordan’s (1989) ecocentric and technocentric model, and more discourse orientated approaches which I will show offer a valuable extension to these models.

As discussed above the concept of paradigms relates to the work of Kuhn (1970) on scientific revolutions, and the displacement of a dominant knowledge system with a rival knowledge system. These are dynamic processes in which the 'alternative' way of thinking in replacing the dominant way becomes the new dominant way of thinking. The NEP and DSP model described by Dunlap and Van Liere (1978) was influential in attempting to map out contrasts in worldviews. These differences center around the value of nature, scope of compassion, avoidance of risk, concerns about limits to growth, the need for social change (for environmental ends), and political beliefs which include such things as the role of 'experts' (see Table 5.1).

**Table 5.1: New Environmental and Dominant Social Paradigms**

(summarised from Milbrath, 1984).

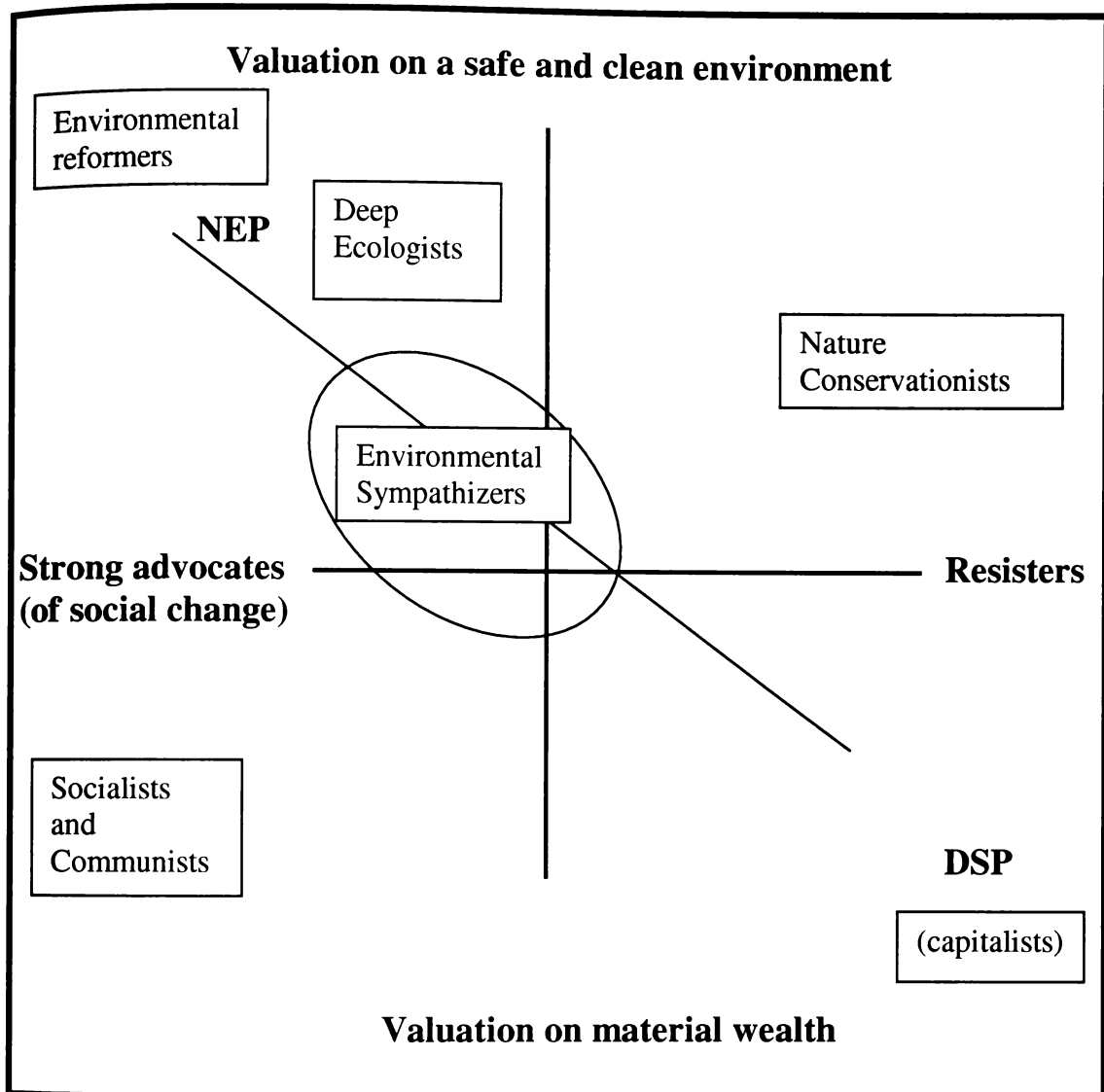
<b>Dominant Social Paradigm</b>	<b>New Environmental Paradigm</b>
<ul style="list-style-type: none"> <li>• Low valuation of nature</li> <li>• Compassion only for those near and dear</li> <li>• Acceptance of risk to maximise wealth</li> <li>• No limits to growth</li> <li>• Uphold status-quo</li> <li>• Old politics ('expert' decision making, market control)</li> </ul>	<ul style="list-style-type: none"> <li>• High valuation of nature</li> <li>• Compassion for people, species, and generations</li> <li>• Risk avoidance</li> <li>• Limits to growth</li> <li>• Structural change needed</li> <li>• New politics (participatory, direct action)</li> </ul>

The New Environmental and Dominant Social Paradigms model is useful in highlighting the values that permeate environmental approaches. Generally speaking government/industry can be seen as currently adhering to the DSP, while environmental groups can be seen as adhering to the NEP. The model has been built upon to describe different groups' relationships to the DSP and NEP and to explain differences in approaches to agriculture. Lester Milbrath (1984) describes how environmental sympathisers can be found adhering to both the DSP and the NEP, but are generally found closer to the NEP than the DSP. The model is further expanded by the graphing of two intersecting continuums on 'valuation of a safe and clean environment' to 'valuation of material wealth' on one axis, and 'strong advocates of social change' to 'resisters to social change' on the other (see Figure 5.1).

This model is useful in illustrating how environmental sentiments are not exclusive to one group, but held by many groups that may have very different values underlying their statements. For example, although deep ecologists<sup>62</sup> and nature conservationists may both consider themselves to be environmentalists, and value a safe and clean environment, they have contrasting views on the need for social change (a strong belief in, and resistance to, social change respectively) as illustrated in Figure 5.1.

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<sup>62</sup>. Deep ecologists believe in the interconnectedness of the ecosystem. This belief often includes a spiritual dimension to it, but unlike Romantics, I believe deep ecologists propose that significant structural change is necessary.



**Figure 5.1: The DSP and NEP Model Showing Environmental Sentiments (summarised from Milbrath, 1984)**

Another extension of the DSP and NEP model that is useful to this thesis is its application to agriculture. Curtis Beus and Riley Dunlap (1990) have related the DSP and NEP to alternative (organic) and conventional (industrialised) agriculture (see also Wynen, 1996). Key differences in the practices and philosophies are thus related back to contrasting values evident within the DSP and NEP model. The conventional

agricultural paradigm (CAP) is characterised as relying on centralised political, and agricultural distribution networks creating a model of dependence on industry (such as seed and fertiliser companies), relying on market competition, working against nature, crop specialisation, and being grounded in capitalist exploitation. In contrast the alternative agricultural paradigm (AAP) is characterised as relying on and creating decentralised systems of power, operating independently (such as closed system organic farms), working with the cycles of nature, and producing a variety of crops (through such practices as crop-rotation), and restraint in resource use (see Table 5.2).

**Table 5.2: Conventional and Alternative Agricultural Paradigms (summarised from Beus and Dunlap, 1990).**

<b>Conventional Agricultural Paradigm</b>	<b>Alternative Agricultural Paradigm</b>
<ul style="list-style-type: none"> <li>• Centralisation</li> <li>• Dependence</li> <li>• Competition</li> <li>• Domination over nature</li> <li>• Specialisation</li> </ul>	<ul style="list-style-type: none"> <li>• Decentralisation</li> <li>• Independence</li> <li>• Community</li> <li>• Harmony with nature</li> <li>• Diversity</li> <li>• Restraint</li> </ul>

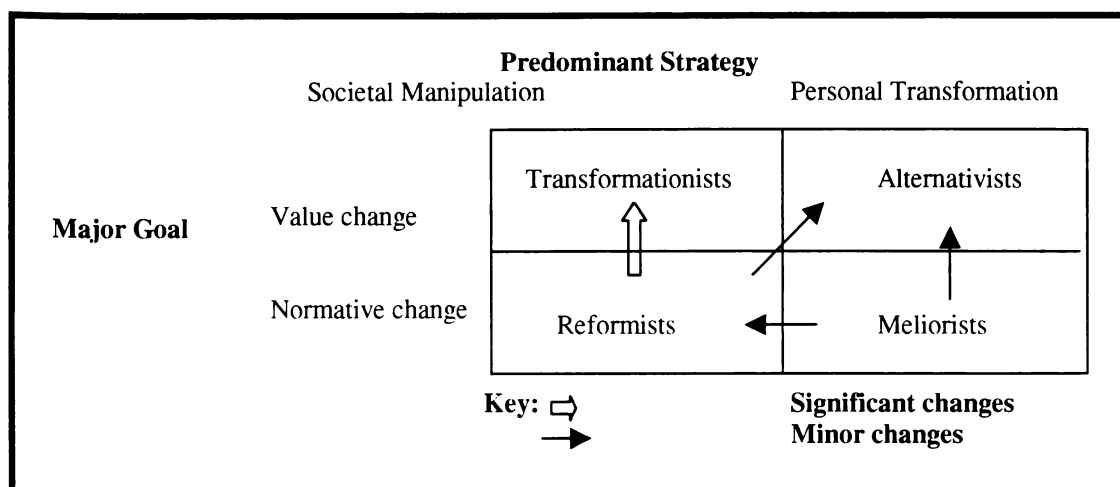
This depiction is useful in contrasting the values underlying those who quest for further industrialisation of agriculture in the form of GE, and those who seek the alternative to GE, organics. These issues will become apparent in this study as forming the contrasting goals of the bioproponents and the environmental groups in the RCGM.

I see use in these DSP and NEP models in their attempts to explain the underlying values behind the different approaches to the environment. I do however see a danger in setting up a rigid dichotomy between the environmental groups and the bioproponents. There is a contrast in worldviews, but emphasising this creates the potential to re-describe the arguments in a simple polarised fashion rather than analyse the nuances of the debates. Viewing the situation as a dichotomy in values may lead to viewing the debate, such as that over GE, as having stagnated and consequently discussion may appear futile. Cotgrove (1982) states that protagonists in debates are ‘talking past each other with mutual incomprehension’ (p.33). This is seen as ‘natural’ as Cotgrove suggests: ‘It is the implicit, self-evident, taken-for-granted character of paradigms which clogs the channels of communication’ (p82). However, I propose that viewing groups merely as representing competing paradigms can lead to an analysis in which meanings appear fixed, constant and immovable, rather than inherently unstable as people move in and out of paradigms when discussing issues.

In this thesis I acknowledge the underlying differences in worldviews as there are clearly two perspectives being presented in the RCGM by the bioproponents and the environmental groups—GE and organics. But rather than re-describe the clash in values, I will analyse the way the very debate itself continually re-negotiates the boundaries of fundamental issues embedded within the discussion about GE—such as Progress, science, and the role of experts. My approach will thus escape the cycle of re-description and the sense of helplessness that accompanies this.

Like Milbrath (1984), Cotgrove (1982) attempts to use the DSP and NEP model as a basis from which to move past a dichotomy to appreciate a variety of perspectives on the environment. In his two-by-two matrix environmentalism is broken up into those who seek social or personal transformation and who seek normative or value changes. Cotgrove differentiates early (1960s and 1970s) environmentalism from that of today by suggesting that although the environmental movement has always contained a mixture of reformists and radicals, it can be seen as having gone through a major shift from a reformist movement (focusing on normative change and social manipulation) to a transformationist movement (where the emphasis, although still on social manipulation, has moved to a focus on value changes) (see Figure 5.2).

As such, the emphasis has changed from one on legal processes and lobbying to a concentration on no-growth issues. Cotgrove (1982) refers to the work of Dunlap (see Dunlap, and Van Liere, 1978) who suggests that this shift in environmentalism has occurred due to the developing clash in values between DSP and the NEP, which pushes environmentalism into a more radical direction.



**Figure 5.2: Changes in the Environmental Movement Since 1970 (Cotgrove, 1982).**

Although seeking to elucidate differences in environmentalism, especially the change in consciousness since the 1960s, my concern with Cotgrove's (1982) model is the placement of modern environmentalism in the 'transformationists box' (see Figure 5.2). Although the diagram highlights the variety of environmental perspectives it still appears to show contemporary environmentalism as having reached (an ultimate) transformationist stage, and consequently runs the risk of glossing over the complexity and contradictions in modern environmentalism. I suggest that contemporary analysis of the environmental groups in this thesis will show environmentalists taking a combination of approaches, transformationist and reformist, as well as alternativist and meliorist (see Chapter Seven).

A significant factor when analysing environmentalism is to address the environmental sentiments of industry/government and evaluate how these compare to those of the environmental groups. I wish to stress this as the bioproponents and the environmental groups both claim to have environmental commitments such as 'sustainability'. An established dichotomy between industry/government and the environmental groups may not be the most useful way of analysing the debate when the same terms are at times used by all groups, as it could lead to mere re-description of the values underlying the terms used by the various groups.

O'Riordan's (1989) technocentric-ecocentric model adds another useful perspective to such analysis. Like Milbrath's (1984) framework, environmentalists are not confined to one place on this model. The differences between technocentric and ecocentric groups are evident in their approach to structural change, whether environmental

problems are seen as social or technical problems, faith in science, and role of experts in decision-making. Technocentric environmentalism, which includes accommodationism and interventionism, upholds a belief that the current social and political structures of society are adequate for dealing with environmental concerns. It is scientific advancement that is seen as holding the potential to overcome environmental problems. Society is portrayed as adjusting and progressing with each new scientific and technological breakthrough. Continuing Progress is seen as the desirable goal for technocentric environmentalists. Scientists therefore should be the ones who advise on environmental matters as solutions are technical issues requiring further innovation.

Ecocentric environmentalism, on the other hand, which includes Gaianism<sup>63</sup> and communalism, poses a challenge to the order of society by proposing that environmental goals can only be achieved if significant structural change occurs. This is seen as necessary because environmental problems are perceived as social problems, requiring social solutions. Science and technology alone are therefore not capable of bringing about the changes deemed necessary. Furthermore, technological solutions are not seen as the desirable tactic as they place authority in the hands of a few rather than encompassing more democratic social approaches. O’Riordan’s (1989) model is useful in that environmentalists can be seen as taking ecocentric or technocentric approaches—upholding or challenging the status quo.<sup>64</sup> It is to this point on the extent

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<sup>63</sup>. Gaianism is a theory, with a teleological premise, based on the work of James Lovelock. The earth is seen as an organism called Gaia (see Lovelock, 2000).

<sup>64</sup>. For a comparison of ecocentric and technocentric philosophies see Coutinho’s (1997) analysis of the *Ecologist* and *Our Common Future*.

to which environmentalism is challenging modernist ideals that I now turn, by analysing their relationship to reductionist science (see Table 5.3).

**Table 5.3: Environmentalisms (summarised from O’Riordan, 1989).**

<b>Ecocentrism</b>	<b>Technocentrism</b>
<ul style="list-style-type: none"> <li>• Structural political and social change is necessary</li> <li>• Environmental problems are social problems</li> <li>• Science cannot provide solutions</li> <li>• Inclusive decision-making</li> </ul>	<ul style="list-style-type: none"> <li>• Retention of political and social status-quo</li> <li>• Environmental problems are technical problems</li> <li>• Modernist faith in science and economic growth</li> <li>• Experts know best</li> </ul>

### 5.1.3 Environmental Groups and Modernist Science

Environmental groups are involved in the GE debate primarily because GE is about the relationship between humans and nature (Sutton, 1999). Environmentalists’ criticisms can be seen as postmodern critiques as they present challenges to industrialised society’s nature-culture dualism (see Chapter Two, also Beck 1992a). However, these are also debates about science and using science. As mentioned, in Chapter One, it was a group of scientists who first called international attention to the possible dangers posed by recombinant DNA research. Furthermore, science has been thought to be setting the terms of the debate as GE research is already underway—thus

environmentalists are seen as taking a re-active position and are therefore disadvantaged (Sutton, 1999).

Present-day environmental groups both use science and challenge the philosophies behind it. Accordingly the relationship between science and the present-day environmental movement is ambiguous. Despite social movements, such as environmental groups, being seen by Beck (1992a) as agents of reflexive modernisation, environmental groups have a unique and intimate relationship with science compared to other social movements (Yearley, 1994). Although other social movements have also relied heavily on science to win their arguments, the difference is that some environmental problems are only perceived through science (such as stratospheric ozone depletion) (Yearley, 1994). At the same time environmentalists may have misgivings about science because it contributed to the creation of many of the environmental problems in the first place (Yearley, 1992).

Environmental groups, despite having developed differently around the world (Yearley 1995) have, on the whole, developed a tradition of using science in their campaigns (Grove-White & Szerszynski, 1992; Hannigan, 1995; Sutton, 1999; Wynne, 1982, Yearley, 1991; 1994; 1997). Indeed some authors contend that British environmental groups have become increasingly reliant on science (Sutton, 1999; Yearley, 1997). Even the more radical groups that have reservations about science have followed the more conservative groups in using scientific arguments (Yearley, 1992). In addition some of the larger groups, such as Greenpeace International, have become increasingly

professionalised and this detracts from engaging the publics in environmental issues (Sutton, 1999).

The 'authoritative advice' of science has been used by environmental groups for a variety of issues, from global warming to the release of genetically engineered organisms, as a way of gaining credibility and respectability (Sutton, 1999; Yearley, 1995). Donald Snow (1992) puts this boldly when he writes that:

*'At base the movement has scientific integrity or it has nothing. . . . When, late at night, they wonder whether they are doing the right thing, they have only two things to fall back on: an ethical compass and honest science (p.13).*

Despite the apparent popularity of using science, it is not an unambiguous option for environmental groups. Science may be helpful when dealing with authorities that use rational arguments and may respond better to scientific claims than discourses with a spiritual or moral basis (Sutton, 1999; Yearley, 1992). However, there are also limitations to using science. Yearley (1996) proposes that the use of science by environmental groups, whether critically or uncritically employed, is problematic.

*Groups may embrace the supposedly disinterested and universalistic charters of science; they are then ill prepared for cases when the authority of science is not robust under legal or political pressure. Alternatively, they can adopt a critical and sceptical approach to science as a form of knowledge. But this leaves them in an interpretive fix when they want to support the judgements of the expert panels or official scientific agencies, since they have only ad hoc ways of distinguishing between the science they support and the science they don't (p. 200).*

The use of science against science highlights the fallibility of science, a process of self reflection necessary, according to Beck (1992a), for society to become reflexive. However, there are a number of problems with this approach. Firstly, inconclusive scientific proof has often been used by authorities to justify not taking action on a

number of environmental issues (Yearley, 1994). As Brian Wynne and Sue Mayer (1993) state: 'Although the green view is now more generally accepted the onus is still on environmentalists to prove that a threat exists'. Joel Tickner, Carolyn Raffensperger and Nancy Myers (1999) point out that environmentalists have 'been struggling to find ways to protect public health and the environment in the face of scientific uncertainty about cause and effect' (p.1), and this has led to environmentalists taking up the precautionary principle (see Chapter Seven).

Secondly, there is also the risk that environmental groups will try to win the argument solely through the use of science when environmental problems have a much broader providence than science alone (Yearley, 1994). An example of this second problem can be seen in the previously discussed GE debate in Britain (see Chapter One). In this case the environmental groups Green Alliance and Greenpeace debated the physical risks of releasing GMOs into the environment. The debate was therefore configured on 'sound science'—the dominant discourse. In effect it meant accepting the substance and terms of the debate as set by the bioproponents (Grove-White, 1996). Such tactics entrench the modernist rational-romantic discourse split (Grove-White & Szerszynski, 1992). When debating on modernist grounds, and thus on the bioproponents terms, environmental groups are often out manoeuvred and 'out muscled' (see Rogers-Hayden & Hindmarsh, 2002).

Phil Sutton (1999) states that using science against GE is especially precarious for environmental groups as the groups are against further use of GE crop trial research which is supposedly meant to help find the answers to many of the questions the

environmental groups pose. Thus the environmental groups use of science makes it particularly difficult for them to produce an effective case against this type of scientific research. There is also danger that science may not be able to support an argument against GE, and if there is no scientific case against GE environmental groups may have prevented themselves from being able to argue against it. Furthermore, Sutton (1999) goes as far as to say that the moral case against GE is 'continually being undermined by environmental organisations' increasing reliance on scientific research findings' (p.3).

Environmental groups' arguments against GE are much broader than science. For example, within the RCGM the environmental groups address the lack of 'fit' between GE and their visions for an ecologically sustainable society. They discuss numerous issues which include the role of multinational petrochemical corporations,<sup>65</sup> globalisation of the food networks,<sup>66</sup> lack of democratic decision-making, the need to take into account Māori objections to GE, in addition to the corruption of the 'purity' of science due to the organisation of funding. Here I concentrate on their discussions against continued economic growth and unlimited faith in science and technology in environmentalists' propositions for a sustainable society, and their suggestions of the precautionary principle which challenges the neutrality of science and the faith in scientific expertise to advise on GE (see Chapter Seven).

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<sup>65</sup>. There are a handful of transnational corporations that produce the majority of genetic engineering products globally. These corporations generally include petrochemical, pharmaceutical and agricultural interests within them. See Peter Daly (1985) for a description of the origin and development of Monsanto. These corporations have more recently become 'Life Science' companies. See Michael W. Fox (1999) for a discussion of the development of Life Science companies. For a discussion on the role of the petrochemical interests in the development of genetic engineered crops see Boyens (1999) and also Bernado Sorj and John Wilkinson (1994).

<sup>66</sup>. For a discussion on the globalisation of food network refer to Richard Le Heron, (1993); also David Goodman and Michael Redclift (1991).

In contesting genetic engineering through the RCGM the environmental groups were accordingly contesting, implicitly or explicitly, assumptions of modernity. Susan Cozzens and Edward Woodhouse (1995) suggest that within the broader environmental movement many would be unaware that their contestation of GE could be considered as epistemological and/or ontological. Yet, many environmental groups may progress from addressing the issues that triggered their environmental concern to epistemological and/or ontological concerns. For example, those who began campaigning by addressing visible pollution may also develop a critique of systems of knowledge when their experiences of the visible pollution are discounted in favour of contradicting 'scientific evidence'. Likewise, in campaigning against genetic engineering those who began by expressing a moral aversion to tampering with the genetic 'code' may, upon being challenged by scientific objection, turn their attention to examining the underlying scientific worldview in more detail.

Degrees of awareness that environmental and/or social critiques are also critiques of modernity may therefore vary. This is especially the case among those categorised as 'light greens', 'reform greens', or 'shallow greens'. By way of contrast, 'deep greens' or radical environmentalists, the women's health movement, and the alternative health movement, possess more sophisticated critiques of knowledge/power, and are therefore more explicit in their critiques of hegemony, and modernist discourse.

However, Andrew Blowers (1997) suggests that environmentalists, as previously mentioned, often do not explicitly challenge the system but rather work towards policy input seeking to alter environmental regulations without any structural change, and thus

he suggests they can therefore be considered actors of ecological modernisation (see below). He does nevertheless cite examples of groups, such as Greenpeace, that take direct action and participate in policy development, suggesting that this highlights both the complementary and opposing nature of these perspectives. And it is to this I now turn.

## **5.2. Dominant Contemporary Environmental Speak—Ecological Modernisation**

Within ecological modernisation, governments form partnerships with industry to seek ‘solutions’ for environmental problems. Ecological modernisation began to gain popularity in the 1980s. An example of its institutionalisation is seen in the global endorsement of the Brundtland report *Our Common Future* (The World Commission on Environment and Development, 1987) (Blowers, 1997; Hajer, 1996; Hannigan, 1995). As mentioned above, this was the second significant report drawing attention to the dangers of Progress. However as Wybe Douma (1996) states:

*This time, an attractive and acceptable solution is presented, namely a shift towards sustainable development. The report defines this solution as development that meets the needs of the present without compromising the ability of future generations to meet their own needs . . . the idea of sustainable development as welcomed worldwide. It has been even suggested that the consensus about the need for sustainable development exists because the only thing sustainable about it is the multitude of opinions on what it actually means (p.3).*

Although the Brundtland report led to a change in conceptualisation for governments in recognising that the ‘environmental crisis’ demands change in the institutional arrangements of society, it is based on the premise that addressing environmental

problems and economic growth are compatible goals (Hajer, 1995; 1996). Indeed it suggests that environmental problems can be overcome with further technological and procedural innovation that can be the impetus for further economic growth. In effect, ecological modernisation is about further modernisation to address the problems of modernity. Examples can be found in tropes on sustainability, the precautionary principle and even on biotechnology (Hajer, 1996; Hay, 2002).

Grove-White (1993) identifies four problems with these types of environmentalisms. The first problem involves the trivialisation of the publics' roles. He suggests that despite the identification of environmental problems by non-governmental organisations (NGOs), it is science that is seen as defining the parameters of the problems. The second problem is that the role of science is inflated, and the social construction of science is overlooked. Thirdly, this debate frames all environmental concerns into 'interests'. Finally, its concentration on science overlooks and marginalises the apparent capriciousness, open-endedness, spiritual, and cultural aspects of life. The entrenchment of these environmentalisms is seen as enabling governments (and their agencies) to shift control of political environmental initiatives from NGO inspired media images to their own 'rational' priorities. Ecological modernisation therefore acts to subdue environmentalisms' challenges to modernity. The role of modernity in the debate over GE in the texts of RCGM forum will follow in subsection 2, when I deconstruct the texts of the bioproponents and environmental groups.

## PART 2 Subsection 2:

# The Texts of the RCGM

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The second subsection of Part Two forms the final part of the examination of the discourse of the RCGM. In subsection One I established that modernity forms the social and historical context of the RCGM, and illustrated how this affected the discursive field of the RCGM. I now move on, in the following 3 chapters, to discuss these influences on the text of the RCGM. I start by analysing how the hegemonic notions of modernity can be seen in the bioproponents texts (Chapters 6). I then further explore the role of environmentalism in challenging these notions (Chapter 7), before analysing the responses of the bioproponents to this challenge (Chapter 8).

## 6

## THE HEGEMONIC TROPES

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In the previous chapter I suggested that ‘environmental commitments’ was a contested notion, highlighting the importance and uniqueness of the relationship between environmentalism and science. In this chapter I argue that, despite the apparent universal enthusiasm of all parties to be considered environmentalists, the bioproponents’ tropes are embedded within modernist, and thus anti-environmental, ideals. The bioproponents espouse science as providing Progress. They proclaim science to be neutral, and demand that scientists be upheld as the experts and therefore the decision-makers in society. I argue that these modernist tropes, that are dominant and consequently hegemonic within society, are part of the negotiation of science within the GE debate and their influence carries through the boundary dispute to shape the findings of the RCGM.

### **6.1 Autonomous Science is Progress**

Science as an embodiment of Progress is found in the submissions and witness briefs of the bioproponents. In its submission to the Commission the New Zealand Life Sciences Network (2000) state that:

*The discoveries of fire; domestication of animals; the use of metals for implements; seafaring; electricity; motorised transport; flight all carried unknown risks. Today those same discoveries are part of our daily lives, we even depend on them for our daily existence and we choose to accept the risks associated with those beneficial activities. The discoveries of biotechnology are no less, or more, risky (p.23).*

Genetic engineering is presented as an inevitable part of the progress of science and technology, the ‘natural’ progression of human development. As science develops so too does the human condition. The modern lifestyle is presented as dependent on this progress. Les Levidow and Joyce Tait (1995) describe this tactic with regards to GE in Europe when they state that GE is presented as safe as it may be regarded as pushing along evolution.

*Paradoxically, biotechnology is presented as safe and benign because it allows us to nudge along, improve upon, the evolutionary process. Thus industry’s green rhetoric portrays biotechnology, in effect, as a benign controlled evolution (p.128).*

Such representations of innovation portray science as offering only one path—advancement. Humans are presented as building one advancement upon the next. John Dryzek (1997) refers to such hopeful narratives on science leading to Progress as Promethean. In Greek mythology Prometheus stole fire from the Gods—symbolising the unlimited ingenuity of humans. ‘Prometheans’ claim that the earth is unlimited because each time a resource is seen as running out they believe people will develop a substitute. These narratives thrived along with capitalism and the industrial revolution. It is typified by an unbounded faith in the capacity of humans to manipulate the world for their needs.

The passage from the NZLSN quoted above infers that society's technological capabilities have moved from fire to electricity to GE in step-by-step improvements. Genetic engineering is thus inevitable, not a chosen direction. Science appears separate from values and culture—as autonomous. By proposing such a list of technologies it seems that choosing not to use GE would be as ridiculous as having chosen not to use fire. Science and technology are therefore presented as the opposite to human ignorance, and the modernist dualism of progressive (GE) contrasting primitive (pre-fire) times is highlighted.

The list implies that all innovation is positive. The list however, could have been very different and the conclusions drawn need not be that innovation is a human trait which always results in constructive outcomes. An alternative passage could have read: *Fire, cigarettes, D.D.T, thalidomide, ozone depleting substances, nuclear weapons, and genetic engineering: Today coping with the effects of some these innovations are part of our daily lives. The human race has ever been dealing with potential danger. Not all movement is forward. Unlike what we have done in the past we should take care.*

The NZLSN also imply that concerns about GE are based on 'unknown risks', and that once accepted, GE technologies will be 'part of our daily lives' as the benefits will be accepted as outweighing the risks. The implication is that it is just the fear of the unknown rather than of the potential negative effects of the technology that concern people about GE. All human progress is seen as being achieved through science, which has inherent risks, accordingly Progress and complete safety are not possible.

Moreover, the NZLSN state that GE is ‘no less, or more, risky’ than previous technologies yet its list leaves out some of the important innovations from the ‘alternative list’ above, such as ozone depleting substances and nuclear weapons. If, as the quote suggests, GE is no less risky than these other ‘progressive’ technologies (such as nuclear weapons), the publics’ apprehension about GE would make sense and it would not follow that they are merely afraid of the unknown.

The theme of autonomous scientific and societal Progress is extended by Patrick Moore (2000) in his witness brief on behalf of the New Zealand Life Sciences Network. In his witness brief Moore builds upon many modernist concepts to explain the dangers of not using GE.

*I call upon the Royal Commission to consider the subjects of genetic modification in a truly global perspective, to reject unfounded allegations and to accept demonstrated benefits. It is not without precedent that civilisation has been thrown into the dark ages and anti-intellectual periods due to the superstitions and myths of cliques with no science. I ask you to listen to reason and truth and to assert the right and benefit of scientists to continue to explore nature and to provide the means for our survival and good fortune (p.11-12).*

Given that GE is a subset of the western discourse of modernist science (see Shiva, 1993; 1994), Moore’s ‘truly global perspective’ may be read as ‘hegemonic western values’ and it is these that he is urging the RCGM to adopt. One of the effects of this is the devaluing of local knowledges. Opposition to GE is seen as unfounded while the science of GE is presented as demonstrated. In comparison non-scientific knowledges are portrayed as less ‘real’ than those of science. All other value systems can be seen as ‘unfounded’. He continues by naming these knowledges ‘superstitions and myths’, which he sets up in direct opposition to ‘reason’ and ‘truth’. Genetic engineering and

science are therefore progress and knowledge, while indigenous, local and other environmental knowledges lack 'truth', and should consequently be disregarded.

Through the metaphor of the 'dark ages' the implication of complete intellectual ignorance is juxtaposed against science which may provide survival for the future through Progress. It is significant that Progress was initially a Judeo-Christian notion of linear development toward a utopian endpoint. As Jeffrey Alexander and Piotr Sztompka (1990) claim: 'If the Reformation brought this heavenly idea down to earth, the Enlightenment gave it for the first time a fully secular form' (p.1; see also Barry, 1999). Pre-Enlightenment thinking therefore relied on religion while Enlightenment transformed Progress from a religious to a secular—scientific—ideal. John Barry (1999) concludes that Progress is a master concept or grand narrative and at the very heart of the Enlightenment ideal. Progress is not however presented as a utopian ideal but as the 'truth'. The importance of Progress as a utopian ideal is reinforced by Eeva Bergluns' (1999) discussion of narratives when she proposes that such presentation of grand narratives as given 'serves to dampen debate about substantive political issues through downplaying the crucial role of imagined utopia' (p.135). As Progress is presented as 'natural' rather than utopian, yet environmentalists visions such as sustainability are hegemonically dismissed as utopian, important opportunities to discuss the future directions for society are missed.

It is also noteworthy that in the above passage by Moore (2000) it is scientists who are to provide the means for survival through exploring nature, rather than nature providing for the future. Nature is presented merely as a raw material to be exploited by man

(science).<sup>67</sup> who will produce from it. The assumption that nature's limits must be overridden for Progress stems from the ideals of the scientific and industrial revolution, and is reinforced through technology and economics (Shiva, 1993). 'Rooted in the Judeo-Christian tradition, the current dominant social ethic emphasizes the subservient role of nature in perpetual service to man, leading to a questionable type of progress' (Dwivedi, 1986, p.379). The most influential figure in this conceptualisation of nature was John Locke. His utilitarian perspective on the environment provided a rationale for its commercial exploitation. Land left to nature was seen as waste land—everything not serving humans was seen as worthless (Rifkin, 1992). Jeremy Rifkin (1992) rejects such Enlightenment legacy thinking as contrary to environmentalism:

*While the land and the terrestrial ecosystem need to be better utilized to sustain human life, they are not simply regarded as 'things' and 'places' people privately own. The very idea of private ownership of part or all of an ecosystem is inimical to biospheric political thinking (p.313).*

The mechanisation of nature along with the other elements of Enlightenment legacy thinking was combined into a comprehensive cultural paradigm by Smith (1723-1790) in 'The Wealth of Nations' [1776] (Oelschlaeger, 1991, p.91). Smith envisioned 'a world where the engine of economic growth drove society relentlessly forward in a ceaseless expansion of the production-consumption cycle' (Oelschlaeger, 1991, p.92) and Progress was the ethical justification for capitalism.

The apparent inevitable Progress of GE from scientific experimentation is also expressed in the following passage by The New Zealand Life Sciences Network (2000):

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<sup>67</sup>. See Chapter Four for an ecofeminist discussion on the relationship between patriarchy, exploitation and science.

*In our view a decision to wilfully stop or even slow down the pursuit of knowledge in this or any other scientific endeavour imposes a penalty on generations to come which cannot be ethically or morally sustained (p.11).*

Science appears not only to be an undirected quest not influenced by human agency, culture, values or politics but an autonomous knowledge search of the highest moral value that should be beyond intervention. Stephen Hill (1998) provides a thorough critique of this idea in *The Tragedy of Technology*. He suggests that technologies can be read as cultural texts in a similar way as reading language as text, and that the invention and up-take of a technology in society is about the alignment of the values inscribed in the cultural text of the technologies and those of wider society. Moreover 'the 'authority' of the technology text, only exists because of alignment between the internal cultural values of the technology 'text' and the values of the wider society as a whole, an alignment that renders alternatives invisible' (Hill, 1998, p.8). It follows that wilfully stopping the development of GE is not stopping all scientific investigation but making a conscious decision about the direction along which society is to develop.

Looking at agriculture in particular, the autonomous science perspective is reflected in the dominant reductionist approach. Technology is seen as solving the problems of agriculture for which previous technologies are mainly responsible (Liodakis, 1997; see also Beck, 1992a).

## 6.2 Science is Neutral

The social change that occurs through technological Progress occurs without reflection as science and technology are seen as value neutral. Neutrality is a theme apparent in the following passage by Monsanto New Zealand (2000) about public submissions to ERMA regarding applications received for field trials.

*Intelligent and objective assessment of GMO projects by the New Zealand public is the objective of the regulatory process. Monsanto's observation is that input by some opponents of biotechnology is not pertinent to particular applications, but is rather a wide-ranging commentary on the perceived evils of GM technology, corporate control of world food supply, globalisation and other general issues (p.39).*

Monsanto New Zealand contrasts intelligent and objective assessment with some of the opposition to GE in submissions to ERMA, implying that these submissions lacked both intelligence and objectivity. Thus, to be objective is held in as high esteem as to be intelligent. If opposition to GE is neither intelligent nor objective, the implication is that support for GE must be both. This idea of objective assessment of technology is also evident in Monsanto New Zealand separating concerns over GE into those over the technology on the one hand and the control and use of the technology on the other. Monsanto New Zealand (2000) present the system of constructing the technologies as devoid of responsibility for any consequences of the technologies. The reductionist idea that technologies can be judged, not only separate from the systems that produce them but, separate from the political effects of the use of the technology is critiqued by Langdon Winner (1999) when he argues that in technology controversies the most provocative idea is that technologies have political qualities. This is a critical perspective that analyses how technologies require or are compatible with political

formations, such as viewing GE as inseparable from biocolonisation..<sup>68</sup>. Challenging a technology in reference to the political implications of its use exposes the political nature of technologies and highlights the possibility of alternatives, while viewing technologies as neutral allows the political implications to continue unchallenged. As George Liidakis (1997) states, the dominant perspective views technologies as neutral and this ‘ideologically legitimises the technological pattern of western capitalism’ (p.62).

The political objections to GE are further marginalised by Monsanto New Zealand, when they are described as ‘perceived evils’. A lack of analysis is implied, suggesting instead that opposition is without foundation.

The NZLSN (2000) further separates what it sees as the neutral scientific assessment of GE from public opposition when it suggests that:

*Despite continuing expression of public concern about the use of genetic modification in agriculture and food the international agencies are continuing to develop standards and codes for the use of the technology based on scientific examination. The risk is that the scientific basis for judgment will be temporarily weakened by political decisions (p.62).*

Here critiques of GE are portrayed as oppositional to science. As a science-based set of criteria will apparently enable approval of GE, public opposition must therefore not be based on science.

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<sup>68</sup>. Biocolonisation is the continuation of colonisation of the majority world by the western world through the use of bioprospecting (the patenting of indigenous plants and knowledges by the west) (see Shiva, 1994).

Scientific examination of GE should accordingly allay all apprehension that may exist concerning GE. Science is presented as not only the highest form of knowledge, but as complete knowledge. Science and politics are seen as mutually exclusive—science is presented as having no politics inherent within it. The suggestion is that science is pure and will become contaminated with political interference. This attempt to demarcate science from politics is used by Gieryn (1995) as his example of ‘protection’ in boundary work (see Chapter Three). Shelia Jasanoff (1990) argues that such distinctions between science and politics are in effect ‘keep out’ signs to stop non-scientists disputing ‘science’. The idea of value neutral scientific work reinforces notions of objective assessments of GE.

There is a great deal of scholarship challenging the notion of objective risk assessment and this is seen as the most significant achievement of science and technology studies as mentioned previously. However, this knowledge has not been translated into the fields of science and policy (Hunt & Shackley, 1999; see also Wynne, 2001). It is in accordance with this hegemonic perspective that environmentalists are often seen as politicising science. However, as Les Levidow and Susan Carr (1999) state, environmentalists are not putting values into an otherwise value neutral domain. Instead they are exposing the already value-laden sciences to public scrutiny.

As highlighted previously, the perception of technologies as neutral—free of values—allows for non-democratic decision-making. In the above passage the undemocratic nature of continuing to approve GE against public concerns goes unproblematised.

### 6.3 Trust Us We're the Scientists (Experts)

Within this trope scientists are upheld as the 'experts' on GE in two ways. Firstly, those who critique GE are said to be misguided as they presumably do not understand science. Secondly, ethics and culture are presented as unimportant as science is seen as the highest form of knowledge and, consequently, judgments on GE should be made by scientists.

#### 6.3.1 They Just do not Understand Science . . . They are Misguided

Gary Lynn Comstockon (2000) on behalf of the NZLSN at first appears to take a different approach to values in science, and thus the role of scientists, from that expressed in the previous passages, by proposing that values are inherent within science.

*Personal honesty and social responsibility represent a second class of values . . . The very institution of scientific discovery, therefore, is supported, indeed, permeated with moral values . . . At its core science is an expression of some of our most cherished values. The public largely trusts scientists, and scientists must in turn act as good stewards of this trust (p. 7).*

These values of the scientists, however, support those previously discussed rather than challenging science as objective and neutral. Science, it appears, is supported by personal honesty and a sense of social responsibility, but this only rests on the individual scientists, as it is scientists who are trusted and must act accordingly. Science is seen as reflecting values. They are seen as universal—'our most cherished' values. The image of the paternal figure is inherent within this passage as scientists are

portrayed as the stewards of the peoples' trust. This implies that others must rely on them to make the right decisions on their behalf. Cozzens and Woodhouse (1995) suggest that tradition emphasises separation of science and politics but this perceived separation no longer exists in either academic scholarship or lay knowledge. It follows that scientists are no longer seen as working for the common good but as 'hired brains of special interests' who lobby for their own benefit.

Moreover, it has been suggested that the shaping of scientific knowledge claims by extrascientific social forces (scientists' 'interests') is the norm rather than exception (Buttel, 1993). These 'interests' have converged to the extent that distinctions between academic, government, and industry scientists are no longer possible (Krimsky, 1991). 'The triad of government, industry and academia constitutes a mutually reinforcing system of self-interest that brings to a close an important period of independence for basic research in the biomedical sciences' (Krimsky, 1991, p.78).

The reason why 'experts' are thought to be needed to make the decisions about GE for society is elucidated in the following passage by the New Zealand Life Sciences Network (2000): 'Perceptions rather than facts heavily influence opinions about GM products' (p.51). The publics' risk estimations<sup>69</sup> are presented not as knowledges but perceptions. Harry Otway (1992) describes how perceptions are things such as sounds, sights and the like and thus risk understandings are only considered perceptions to separate them from reductionist risk estimates.

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<sup>69</sup>. In accordance with the works of Beck (1992a), and Otway (1992), I use the term 'public risk estimates' to mean their complete evaluations of GE—not just probability and magnitude risk estimates.

This dualism between facts and perceptions is reminiscent of the rational/irrational dualism of the Enlightenment. The implication is that perceptions are accepted as being irrelevant rather than being different knowledges of lay people that should be appreciated as their reality—equally as valid as the ‘facts’ (see Beck, 1992a).

Furthermore, the marginalisation of the publics’ knowledges critical of genetic engineering are directly linked to their alleged lack of scientific understanding. Aventis CropScience (2000) describe this as a problem with public submissions to ERMA on GE trials:

*What is clear [is] that calls for public submissions have continued to attract large numbers of submissions which represent a fundamental dislike of the technology and on mass present no relevant scientific basis for consideration against the specific field trial proposal (p.7).*

The generation of ‘large numbers’ of submissions from ‘ordinary citizens’ caring enough to put ‘pen to paper’ is ignored. The democratic issue of the substantial publics’ opposition is not considered. The submitters did not present any scientific opposition, therefore they should be disregarded. It is suggested that these publics present no scientific reason against the field trials and accordingly they present no real evidence. Consequently, what is not scientific is irrelevant.

The ‘large numbers of submissions’ against the GE trials are also down-played by referring to this opposition as a ‘dislike’. The word dislike implies that something is merely not to one’s taste rather than, as Wynne (2001) describes it, ‘intellectually founded moral outrage’ (p.475).

The New Zealand Life Sciences Network (2000) presents a plan to rectify the differences in approaches to GE. It suggests that:

*For that uncertainty to be translated into relative certainty it will be important for several changes in perception to occur:*

- a) The community will have to develop confidence the regulatory authorities are acting in the public interest and from a basis of sound science and information*
  - b) Confidence will need to be restored in scientists and science*
  - c) The public will need a greater understanding of the basic science involved*
- (p.25-26).

Public opposition to GE is referred to as ‘public uncertainty’ suggesting that the publics are not firm in their opinions. The passage also creates another use of the word ‘uncertainty’ in the GE discourse as uncertainty is most often used to refer to the scientific uncertainty of GE.<sup>70</sup> It is stated that the ‘uncertainty’ can be overcome with communication of scientific information. With scientific knowledge the public will appreciate the ‘real and potential’ value of GE, communication of the science will overcome all objections.

The plan described by the NZLSN can be seen as reflecting the traditional public understanding of science model. All three aspects of this plan revolve around reinstating the authoritative status of science. The opposition to GE (which the NZLSN calls ‘uncertainty’ about GE) will apparently be overcome with; a) a faith in regulatory authorities which consider science to be the only valid knowledge basis and disregard all other knowledges as the basis of decision-making; b) reasserting an unquestioned faith in science, with scientists regaining ‘expert’ status, and, c) the public becoming familiar with this knowledge base so they too can view GE from this perspective. With this action plan completed the ‘expert’ value of scientists and the authority of science

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<sup>70</sup>. For a description of scientific uncertainty see Chapter Two, page 31, footnote 33.

will be reinstated and the newly 'educated' lay people will understand that all other knowledge and/or value systems lack validity and they will view GE in the way of science. The issue will therefore be redefined into only an issue of science, and GE will be accepted as the scientists will be trusted as the experts on this. The authority of science is therefore presented as the central issue in the acceptance of GE.

The need to address the publics' evaluations of GE, with science, is further discussed by Steven Hughes (2000) in his witness brief for the NZLSN.

*The Working Party urged the Government and the scientific community to share the responsibilities in disseminating reliable information about the underlying science and to respond to public concerns (p.10).*

Scientists are presented not as another lobby group with vested interests but as providers of the 'reliable information'. It is presumed that scientists and government share the same perspective on GE as together government and scientists are charged with the task of educating the publics. Both scientists and government are presented as the authoritative perspective able to respond to public objections. It would follow that the role of the 'expert' would be to 'set straight' those with concerns about GE.

Levidow (1997) discusses some of the problems of 'educating' the publics on GE by referring to British state funded biotechnology education materials. The materials were presented as correcting misinformation and counteracting people's fears of the technologies. These were 'hardly neutral' (Levidow, 1997). He suggests that if they had played a more democratic role they would have discussed broader issues, including causes of the problems to be addressed by the technologies and alternatives. Stephen

Turner (2001) critiques the notion of public education on science concluding that ‘. . . a programme of extensive public ‘science education’ is merely a form of state propaganda for a faction, that faction of ‘experts’ (p.124). Scientific education therefore implies that with science any objections people have to GE will be overcome.

### 6.3.2 What is this Ethics/Culture Thing? . . . We Have Science

The New Zealand Life Sciences Network (2000) also implies that science is able to overcome ethical objections to GE.

*Globally, the GM debate has been politically motivated with common international issues which include; feeding the starving; food shortages being a function of distribution not insufficiency . . . transgenic modifications play at ‘God’. The evidence shows all issues are addressed by reference to scientific analysis and acceptance that zero risk tolerance is both undesirable and unachievable (p.4).*

In this passage the NZLSN, although stating that the debate has been captured by politics, is also implicating the bioproponents in this role. It suggests that the construction of the debate has been focused around such issues as starving people being a function of distribution, not shortages, of food. In so doing, however, the NZLSN draws attention to environmentalists’ narratives as reactive to the bioproponents statements, such as their claims that GE will feed the hungry. As a consequence, the NZLSN inadvertently highlights the role of the bioproponents in politicising debates surrounding GE. Hence, despite the insistence that the GE debate should be based on the science not ‘other’ issues, this quote implicates the bioproponents in adopting ‘other’ issues.

The NZLSN is also proposing that if something cannot be proved by science it does not exist as an issue. It even juxtaposes playing God with evidence as it dismisses people discussing whether ‘transgenic modifications play at ‘God’’. By following this passage with: ‘The evidence shows all issues are addressed by reference to scientific analysis. . .’ a dualism is created between religion and science—a characteristic of Enlightenment.

Comstock (2000) of the NZLSN takes this narrative further, stressing the importance of science in ethically justifiable conclusions on GE.

*Ethically justifiable conclusions rest on two kinds of claims: (a) factual judgments, based on the best available scientific evidence and theories, and (b) ethical judgments, based on the best available moral principles and theories. Is it ethically justifiable to pursue genetic modified crops and foods? The decision ultimately rests with the citizens of New Zealand who will use their conscience and reason to decide on the ethical questions. However, as these citizens are, by and large, not scientists, they must, to one degree or another, rest their factual understanding of the matter on the opinions of scientific experts. Therefore, ethical responsibility in this decision devolves heavily upon scientists (p. 6).*

He proposes that ethical conclusions are based on facts, which are science; and ethics, which are morals. However, he discounts the values of ethics without science by suggesting that the ethical responsibility rests heavily on scientists, a minority proportion of the overall citizenry. Without science, therefore, the people are not able to make ethically justifiable conclusions about GE. This also implies that purely ethical conclusions about GE can be overridden by those with knowledge of science as they are the only ones capable of ethically justifiable decisions. No other value systems are seen as able to make ethically justifiable decisions about GE. It can be inferred from this that, although science is presented as fact, scientists are seen to present opinions which are the combination of these facts and their moral judgments.

The importance of scientists in decision-making about the direction society should take is further highlighted in the following passage where the NZLSN (2000) discusses why it believes Māori objections to GE can be overridden.

*The critical question to be answered with respect to cultural issues is: Do the cultural rights of one group in society over-ride the rights of other members of the same society to the extent that they confer a right of veto? (p.58).*

In this passage culture is presented as ‘cultural rights’—an apparent sub-set of ‘rights’. What is suggested is in effect the sub-group bioproponents having the ‘right’ to override the wishes of society with their science but the sub-group Māori have no rights as tangata whenua<sup>71</sup> to challenge this. It can be inferred from this that the NZLSN does not consider that bioproponents are a sub-group for GE—only the large numbers of the publics who are against GE.<sup>72</sup>

Exactly how cultural considerations can be overridden is discussed in the following passage by the NZLSN (2000).

*Many issues identified by Maori opponents to genetic technology are the same as issues raised by other groups in society and should be resolved on an equivalent basis (p.11).*

As I have argued, the approach proposed by the bioproponents is the scientific risk based approach. If Māori concerns are to be dealt with by the same approach as applied to Pakeha concerns then the scientific framework is to be applied. This is the dominant approach that presumes that science can answer questions of ethics and culture (see Wynne, 2001). The inappropriateness of this is discussed by Anne Scott and Bevan Tipene-Matua (*forthcoming*) when they highlight the ERMA’s submission

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<sup>71</sup>. A translation of tangata whenua is ‘people of the land’, meaning the indigenous peoples of Aotearoa New Zealand.

<sup>72</sup>. See Chapter One.

processes' inability to cope with Māori concerns as scientific causal pathways cannot be established for concerns of a cultural, ethical and spiritual nature.

This discussion raises an important issue about positioning scientists as the decision-makers on GE. Such a reliance on industry experts means reliance on those who are committed to that paradigm. As Beck (1992b) states, cases of ' . . . acute danger passes the monopoly of interpretation to those who caused it, of all people' (p.106).<sup>73</sup>.

Technological Progress is presented as having only one path due to the perceived neutrality of science. This renders alternative social, and thus ecological, paths invisible. It also positions scientists as value-free experts in comparison to others whose knowledges are clearly based on culture, ethical or spiritual considerations. The lack of reflection on the values within science can be seen in the bioproponents' presentation of this protectionist narrative—falsely separating science from values, which makes challenges to scientists' estimates difficult. This hegemonic model is however challenged and shaped by the counter-hegemonic tropes presented by the environmentalists that I deconstruct in the following chapter.

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<sup>73</sup> . . . As a result expert ideology masquerades as truth, a point highlighted by both Jurgen Habermas and Foucault. Habermas (1989) writes of 'expert cultures' in which the experts help create 'steering mechanisms' of the life-world but whose knowledge is not comprehensive to the culture of the lifeworld. Foucault discusses how expert claims are created by discursive structures which are ideologies taken as 'fact'. Thus the publics and politicians alike accept culturally embedded expertise as neutral (Turner, 2001). Turner (2001) suggests that we currently lack the historical distance to see this in 'expert' claims. Although I view expertise as culturally laden, my approach departs from the concentrations of Foucault and Habermas as I do not view society as the 'colonising of the life-world' like Habermas, nor do I concentrate on the manipulation of the conditions of social life like Foucault. Instead, I view the discourses as enabling experts to gain cognitive authority. This approach is in keeping with viewing debate as constructed through discourse (see Chapter Three). Such an approach enables me to view the bioproponents as attempting to assign cognitive authority to the cultural space they are in through their discourses on GE as progress. This monopolisation discourse seeks to position GE as a 'natural' stage in human evolution —aligning the technology with the modernist cultural text.

## 7

## (EN)COUNTERING HEGEMONIC TROPES

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In the previous chapter I examined the modernist underpinnings of the bioproponents' narratives. In this chapter I will argue that the environmentalists are *engaged* in this debate. They do not merely *counter* these hegemonic tropes but *encounter* them, as 'it is impossible to find a position that is entirely outside hegemonic discourses' (Rose, 1993, p.137). The positioning of the environmentalists' narratives in a chapter after the bioproponents' narratives represents their reactive nature. Furthermore, it represents the oppositional nature of environmentalism, as it has been formed in opposition to the dominant worldview and in doing so environmentalism defines itself (Jamison, Eyerman & Cramer, 1990).

Environmentalists do not present their arguments without science or free from notions of progress or expertise. They instead re-draw the boundaries of these notions, offering alternative conceptualisations. Science is therefore used by environmentalists, like the bioproponents, in their submissions and witness briefs to the RCGM, and is reshaped by their tropes on sustainability and the precautionary principle. This renegotiation of meaning can be seen as a key element in environmental protest. Timothy O'Riordan and Andrew Jordan (1995) suggest that: 'In its restless metamorphosis, the environmental movement captures ideas and transforms them into principles,

guidelines and points of leverage. Sustainability is one such idea . . . [s]o too is the precautionary principle' (p.191).

It is for this reason that I will begin this chapter by analysing the environmental groups' use of science and their direct responses to the hegemonic tropes, before investigating the environmental groups' challenges to these tropes inherent within their presentations of sustainability and the precautionary principle.

## 7.1 Using Science

The environmentalists' texts to the RCGM contain a considerable amount of scientific evidence. In many of the submissions the evidence is presented as lengthy quotations from scientific journals. In addition, the environmental groups' submissions and witness briefs show a strong critique of science. They do however stress that this is not a rejection of science (see Rogers-Hayden & Campbell, 2003).

The unique relationship between environmentalists and science was discussed in Chapter Five, and the sentiments found in the interviews with environmentalists echo these findings. Two important aspects of using science were elucidated by Annette Cotter (Interview, 2001) of Greenpeace New Zealand.

*[The bioproponents were] saying that they were looking forward to the process because they wanted to show us for being unsubstantiated, scare mongering groups that we were . . . they didn't get to do that whatsoever because of the rationale that we had used. I think that the Commission process also, even though it attempted to sort of include more than just the science I think at the end of the day it very much rests on the science of the issue. I mean the chair*

*especially . . . also, Jean Fleming the two of them . . . they seemed to be the two with the most kind of power within the Commission process they were very much always in the center of the, you know, that they were always in the center of the table . . . .*

Firstly, science was used to show the environmentalists as having robust claims. This highlights how non-scientific criticisms of GE are often seen as unsubstantiated, in accordance with the dominant public understanding of the science model, as previously discussed. Secondly, science appears necessary in order to appeal to the members of the Commission who were seen, from their seating arrangements, as having the most power in the process. Their spatiality was interpreted as representing their literal centrality to the process. By saying that the Commission ‘attempted to sort of include more than just the science’ it is implied that the attempts to include other issues were inadequate and ‘half-hearted’.

A third aspect of environmentalists’ use of science in the RCGM was mentioned by Sue Kedgley M.P (Interview, 2001), of the Green Party of Aotearoa New Zealand (and the Safe Food Campaign). She stressed the importance of pitting science against science to dispute the notion of scientific consensus.

*[I]t’s been very important at the Royal Commission to wheel out the scientists who will dispute the credibility of the other scientists and show that there isn’t in fact a scientific consensus. . . .*

By suggesting that scientists can be ‘wheeled out’ it appears that scientists can be called upon, and presented in a display like fashion, to create emphasis. It follows that the credentials of the speakers as scientists must therefore be important. The passage also implies that science can be found that supports and that opposes GE and it is merely a matter of bringing (wheeling) scientists out into the public arena to highlight

this. As mentioned previously, Beck (19992a) stresses the importance of such uses of science to dispute scientific evidence. This is seen as challenging the definitive authority of science, a development necessary for society to move from second modernity to reflexive modernisation.

A fourth feature of the environmentalists' use of science is the renegotiation of science evident within the environmentalists' texts, especially their tropes on sustainability and the precautionary principle. This boundary dispute challenges the bioproponents' conceptualisation of science as neutral leading to Progress and of trusting scientists as the decision-makers for society, as outlined in the previous chapter. In the following sections I will explore how the environmentalists' narratives challenge those presented by the bioproponents before investigating their proposed alternatives—sustainability and the precautionary principle.

### 7.1.1 Challenging Science

The challenge to the reductionist scientific paradigm is evident in the following passages relating to science and scientists. GE Free New Zealand (2001), in its response to 'areas of public interest—health concerns', concentrate on the creation of the problems GE is said to alleviate. By suggesting that science participates in the creation of environmental problems the environmentalists directly challenge the bioproponents' narrative that science is the saviour of the environment.

*Fifty years ago scientists promised that pesticides and nuclear power would provide a safe, bright future. Today biotechnologists are promising a healthy, abundant future; but research demonstrates that genetic pollution is the*

*greatest threat ever to life on our planet, inevitable mistakes will spread without limit and can never be cleaned up. Therefore, only a total ban on genetic engineering can ensure a safe healthy future for humankind (p.12).*

The listing of pesticides and nuclear power, unlike the list presented by the NZLSN (see previous chapter) contests previous promises relating to some technologies. By mentioning these technologies the idea that science can create negative environmentally devastating innovations is naturalised, in much the same way the NZLSN's list naturalised technology as positive. In addition the risks associated with GE are presented as unmanageable and catastrophic as the passage states that 'inevitable mistakes' which are 'the greatest threat ever to life on our planet' 'can never be cleaned up'. The implication is that scientific progress and environmental benefits are not synonymous and can be oppositional. The use of the term 'scientists promised' implies that scientists should not be taken literally as decision-makers as science is based on beliefs that may not materialise rather than known quantities. Finally, by stating that it was only fifty years ago that scientists heralded what are now widely thought to be dangerous innovations, the progress created through science is presented as quickly discounted.

A more direct questioning of the need for science is provided by Craig Holdredge (2001), who addresses 'strategic issues' in his witness brief for ECO. He queries the usefulness of science for the environment to date and questions the wisdom of yet more science.

*We often hear that biotechnology is merely doing what high-yield breeding, industrial agriculture, and nutritional science have done all along . . . but now much more efficiently. In one sense that's exactly right and also exactly the problem: we don't need more of the same. What we need is to overcome an epidemic of abstract, technological thought that conceives solutions in the*

*absence of organic contexts. We need a redefined ability to enhance life's variety rather than destroy it. And we need to realize that the problems of life and society are not malfunctions to be fixed; they are conversations to be entered into more or less deeply. The more deeply we participate in the conversation, the more thickly textured and revelatory it becomes, reacting upon all the meanings we brought to the exchange (p.3).*

In this passage the author is suggesting that industrialised agriculture is a path that has been chosen rather than an autonomous progression of science and technology. The naturalisation of the systems of industrialised agriculture is highlighted, as the bioproponents have suggested that GE is 'merely' a refinement. By suggesting that GE is only doing what these systems 'have done all along' the implication is that reductionism, as a system of beliefs, goes largely unnoticed. In contrast to this, the idea that science is only one type of knowledge system and not 'all-knowing' is conveyed. By using the word 'epidemic' not only is this temporal dominance of reductionist thought highlighted, but at the same time the negative connotations of disease-like behaviour are conveyed.

By contrasting reductionism with organic contexts it is suggested that modern science fails to take account of context, while at the same time it introduces reductionist science and organic (with connotations of the systems of organic agriculture) as oppositional. Furthermore, reductionist science and life enhancement are contrasted, and this is linked to the communication between the belief systems and nature.

While science is presented as imposing on nature through the mechanistic perspective of problem fixing, the holistic alternative is presented as engaging in a 'conversation', implying an exchange of information. It could be seen that reductionism and organics

are presented as a dualism. Reductionism in this presentation can be viewed as representing masculine/culture, and attempting to change nature, while organics can be seen as characterising feminine/nature, as being in a 'conversation' communicating with nature. Such presentations, like the new environmental paradigm and alternative agricultural paradigm, do however change the implications of the dualism as it is traits of the feminine/nature side that are valued, such as holism, and harmony.

### 7.1.2 We are Not Anti-Science

As argued previously (see Chapter Six), GE and science and technology are presented by the bioproponents as synonymous. The rejection of GE by the environmentalists is seen as a rejection of all science and therefore of technological Progress. The environmental groups respond directly to the bioproponents' dismissals of their critiques in their evidence to the RCGM. In its submission Greenpeace New Zealand (2001) answer those who accuse environmental groups of being luddites.

*Critics of genetic engineering have also been dismissed as 'anti-technology'. Yet many of these critics, including Greenpeace, are not anti-technology per se, but are for appropriate technologies, and are committed to the vision of an ecologically sustainable society in which technologies will play an important role (p.66).*

Greenpeace New Zealand addresses its critics by moving beyond the anti-technology, pro-technology dichotomy. In doing this it challenges some of the presumptions on which technoscience are based. Greenpeace New Zealand is contesting the notion of neutral technologies that are merely used inappropriately, proposing instead that technological endeavours incorporate and reproduce values. Accordingly, current

technoscience (of which GE belongs) is seen as reproducing a non-sustainable society—it is an inappropriate technology.

The Green Party of Aotearoa New Zealand (2001) build on this narrative in the following passage.

*Reductionist science does of course, reveal important information about the components of systems and should not be abandoned. However [it] does not have the capacity to look at the big picture, and to factor in what effects a change in one small piece of the jigsaw will have on all the others (p.58).*

Through singling out reductionist science the Greens highlight that not all sciences are reductionist in approach, and that there are multiple sciences. To abandon reductionist science would be to pay it no attention at all—which the Greens is not proposing. Instead the sentiments in this passage suggest a re-ordering of society, in which reductionist science becomes a tool within a holistic perspective. It states that reductionist science can be used only to analyse components, and does not take the big picture into account. Accordingly, for them science is not complete knowledge, and cannot provide solutions—only incomplete pieces of information, as the jigsaw metaphor implies.

#### **7.1.2.1 Science is not Neutral—it is (a Slave to) Big Business**

The need to change the role of science, and therefore scientists, in society is further elaborated upon as the environmental groups directly question the neutrality of science. Wills (2001a), who presented a testimony for six groups, three of whom are

Greenpeace New Zealand, the Greens and Friends of the Earth.<sup>74</sup>, proposes that the biotech industry is (a slave to) big business.

*The ambition of the biotechnology governmental-industrial-academic complex to bring the processes of genetic change under global human control is driven and supported by the misrepresentation of scientists themselves as a morally neutral egalitarian community of scholars who work for common good (p.2).*

By suggesting that there is a biotechnology governmental-industrial-academic complex the author is contradicting the propositions of the bioproponents who suggest that science and scientists are independent and neutral. Instead, he is proposing that the goals of biotechnology cannot be distinguished from government, industry and academia. The extent of this unity is highlighted by the emphasis on a premeditated mission by using the word 'ambition'. Hence, the science of GE is portrayed as a highly political activity with an established agenda. This agenda involves deception through 'misrepresentation' of the goals of science and scientists, and is contrary to their presentation of themselves as altruistic.

The Greens (2001) also question the ethos of the science industry:

*There is growing concern that bioethical technologies are being developed in a moral vacuum, that scientific skill has outrun wisdom, that their economic rationale is too narrow, and that the nature of the risks involved are being ignored by the scientific and commercial fraternity (p.54).*

The use of the word 'bioethical' rather than the more commonly used term 'biotechnology' emphasises the ethical nature of GE, despite assertions otherwise by the bioproponents. The Greens continue by stating that this moral aspect is ignored in the development of these technologies. This contrasts GE with morals.

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<sup>74</sup>. This testimony was presented in addition to his witness brief, which was also on behalf of these same groups.

The Greens also imply that science is a process rather than a knowledge base by referring to scientific skill rather than science or scientific knowledge. This skill is placed in opposition to wisdom. By proposing that the economic rationale of science is too narrow, the Greens suggest that the economic goals have captured science and it lacks independence. In the final aspect of this passage the Greens imply that science is not an unbiased practice, as reflected in the philosophy of science, by suggesting that scientists ignore risks.

The relationship between financial incentives and scientific findings was elaborated upon by GE-Free New Zealand (2001). It states that there is a:

*[c]oncern that commercial imperatives are being allowed to over-ride scientific caution, respect for the complexity of natural systems, and concern for the public good, in the rush to profit from the new technology. (This is exacerbated by scientists reliance on industry funding: this year in Britain 30% of scientist[s] admitted they'd been asked to alter findings to suit their sponsor) (p.46).*

In this passage it is implied that science's internal standards of caution pale into insignificance compared to the desire for financial gain. Accordingly, the private funding of science is presented as corrupting science. This corruption is portrayed as more than financial pressure but also as direct requests to misrepresent work.

### **7.1.3 Scientists are Not Experts on GE as Science is Just One Knowledge System**

Within the critique of science offered by the environmental groups there is a strong theme that science is only one of many value and/or knowledge systems. This

challenges the dominance of science and furthermore the expertise of scientists by suggesting that there are equally valid alternative value and/or knowledge systems which could be used to judge GE—but that these lack the same recognition.

Friends of the Earth (2001) propose utilising perspectives other than science for the assessment of GE.

*We believe there are grounds for respecting other sources of knowledge than scientific quantification; sources that often give us moral law and philosophical insight. Such knowledge should be brought to bear on the issues raised by genetic modification (p.27).*

This suggests that the moral and philosophical issues involved with GE have been overlooked by those responsible for analysing GE due to the limited focus on science.

Annette Cotter (Interview 2001) discusses the dominance of science in society and, more particularly, the RCGM process. She proposes that morals are not considered sufficient grounds for objecting to GE. Mentioning the overwhelming nature of opposition to GE in the public submissions she says ‘. . .you know 98%.<sup>75</sup> of the 11,000 submissions were against GE. . .’, and comments on the difficulty of having this form of objection recognised in society.

*[It’s] like someone saying in a submission ‘I don’t want it’. ‘I don’t want to eat it’ . . . that’s good enough, that’s as good a reason . . . and that should be on a par with saying that it’s an inherently unpredictable organism due to the insertion of the foreign gene into a DNA sequence you know. Its basically saying the same thing ‘we don’t want it’ . . .*

Reliance on scientific expertise is accordingly presented as anti-democratic. The publics’ knowledges of GE are presented as equally valid to scientific knowledges,

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<sup>75</sup>. I calculated this to be 92%, see Chapter One.

but these are not taken notice of in the RCGM forum. Scientisation of the GE debate, in addition to imposing GE on the publics when the majority oppose it, is also seen as renegeing on Aotearoa New Zealand's founding treaty between Māori and Pakeha.

The Greens (2001) propose that:

*This [honouring Te Tiriti o Waitangi] requires that Crown institutions such as this commission accept Maori spiritual and cultural views as having equal weight alongside Western scientific analysis (p.44).*

Science is presented within this passage as culturally specific and therefore not 'neutral'. Western values are consequently inherent in the use of science and working with Māori as equal partners would mean treating western and Māori knowledges as equal. It follows that scientific expertise on GE would not then have sole authority in decisions about GE.

## **7.2 Sustainability**

The use of sustainability was one way the environmental groups moved beyond critiquing the hegemonic tropes to propose an alternative. While the bioproponents presented the autonomous sciences as leading to Progress, the environmental groups challenged this notion by stating that Progress was not a universal goal, and within this argument that science was not an autonomous endeavour.

Although originating as an environmentalists' concept, 'sustainability' tropes have become common (Dryzek, 1997). Their popularity has led some scholars to suggest that public debate on environmental issues is primarily a trope of sustainability (See Dryzek, 1997). Although Dryzek (1997) suggests that this may be overstating the issue, sustainability can be described as a grand narrative—it is no longer tied to those who conceptualised it but rather it has taken on its own public form. Like all grand narratives it is thus worthy of deconstruction (Spaargaren, Mol & Buttel, 2000). This is a central feature of my analysis of the RCGM as sustainability is a concept adopted by the environmentalists, the bioproponents, and the Commissioners (see Chapter Eight).

### **7.2.1 The Life of the Sustainability (Grand) Narrative**

I, like most of the environmentalists in the RCGM, am using the term 'sustainability' rather than 'sustainable development'. Some scholars make distinctions between the two. Fredrick Buttel (1993) describes 'sustainable development,' '[as] the international-development variant of sustainability' (Buttel, 1993, p.24), while Michael Cahill (2002) proposes that 'sustainability is the end-state, whereas sustainable development is the means to achieving that end' (p.2). However, a number of authors, while acknowledging some occasional differences in their application, use the terms interchangeably (see Dryzek, 1997; also Cocklin, 1995).

Although a number of different definitions of sustainability have been found, with some writers identifying between 70 and 100 different definitions of sustainability

(Armson *et al.*, 1997), the most commonly quoted definition of sustainability (and of sustainable development) is that provided in *Our Common Future* by the World Commission on Environment and Development (1987). It suggests that communities throughout the world work towards ‘. . . meeting the needs of the present without compromising the ability of future generations to meet their needs’ (p.43). Sustainability can be seen as having survivalist roots, fearing apocalypse from human actions, but lacking any real environmental radicalism (Doyle & McEachern, 2001; Dryzek, 1997). This is because the conservationist environmentalism prevalent in the concept is conceived in terms of the protection of nature by humans for future human use (Doyle & McEachern, 2001). Ute Collier (1999) elucidates the increasing popularity of sustainability and its prosaic form.

*Since the 1992 Rio Earth Summit, sustainable development has become a buzz word, utilised by politicians, industrialists and environmentalists alike. Few governments and businesses now dare to ignore the principle and the pursuit of environmental goals. Yet, as the Rio follow-up in New York in July 1997 so aptly demonstrated, little progress has been made towards a more sustainable world since 1992 (p.81).*

It is apparent that despite the universal popularity of sustainability there is no consensus on what the term means (Dryzek, 1997). Chris Cocklin (1995) argues that the key to all the different interpretations is that sustainability is ‘. . . the interplay among environment, economy and society—[and that] this is *the* rallying point in what is an otherwise discursive discourse’ (p.245). The balanced, or harmonious, relationship between economic growth and environmental protection inherent in the term sustainability, and more particularly in sustainable development, is often described as contradictory. It has been suggested that these two goals seem ‘irrevocably at odds with each other’, and hence it is only at the rhetorical level the two notions come together to imply consensus (Bourke & Meppem, 2000).

James O'Connor (1993) develops this idea further when he explores what he believes is the underlying question about the sustainability debate—is sustainable capitalism possible? O'Connor states that '[t]he short answer is 'no'' (p.125), '[a] longer answer is 'probably not' (p.126), and a fuller answer entails explaining why capitalism would need to fundamentally change. He states that sustainable capitalism is expanding capitalism, as capitalism must expand or shrink, but cannot remain still. Capitalism survives on the concept that it is more sustainable the higher the profit. Thus, he observes, while environmentalists try to encourage businesses to preserve nature, businesses are trying to alter nature to encourage business.

Because sustainability is often cited as being a tool for environmental goals while its use often leaves industrialisation and its corresponding relationship to the environment unquestioned, it can be seen as a form of ecological modernisation (see Dryzek's (1997) discussion on sustainability in Europe). Accordingly, it is strongly contested whether sustainability as a concept offers a challenge to that of Progress. Irwin (1991) concludes that instead, sustainability is the replacement of the Progress grand narrative. Sustainability has not been achieved, but it is seen as merely the latest modernist expression of Progress.

Although sustainability is not a coherent concept and thus may not be able to provide a seamless challenge to Progress, I will spend the rest of this section on sustainability exploring its conceptualisation by the environmentalists' in the RCGM in order to examine the extent to which sustainability challenges the modernist principles presented in the previous chapter.

### 7.2.2 Challenging Progress with Sustainability

Sustainability is a feature of all the environmental groups' submissions. Although one group (Friends of the Earth, 2001) does not mention sustainability as such in its submission, three groups (Environment and Conservation Organisations of New Zealand, 2001; Greenpeace New Zealand, 2001; and the Green Party of Aotearoa New Zealand, 2001) note sustainability as central to them as organisations and to their submissions.<sup>76</sup> Moreover, all of the environmentalists propose the same utopian vision—Aotearoa New Zealand as a GE-free organic nation. In the following passage Greenpeace New Zealand (2001) highlights the centrality of sustainability to its idea.

*Greenpeace believes that a strategic **vision** is required to provide the necessary critical framework within which the appropriateness of new technologies such as genetic engineering should be assessed. For Greenpeace, this strategic vision is one of an ecologically sustainable Aotearoa New Zealand (emphasis in original, p.7).*

This passage challenges the idea of autonomous technologies leading to Progress by suggesting that technologies can be selected according to the type of society desired. It also presents a contrasting perspective to the dominant model of risk assessment (which will be discussed in greater detail to follow) as the bigger picture is analysed rather than assessing technologies on a case-by-case approach. In regards to GE this would require it to be judged for its potential contribution, or otherwise, towards making Aotearoa New Zealand sustainable—contrasting with the perspective that society must change to keep-up with Progress.

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<sup>76</sup> Although sustainability was also mentioned by the other environmental groups it was not described as central to their submissions.

For all six environmental groups, their visions of sustainability do not include the release of GMOs into the environment. The following passages from the Nelson GE Free Awareness Group (2001) are illustrative of this.

*Genetic engineering is all about experimentation and has nothing to do with an effective sustainable future (p.23).*

*. . . [S]ustainable systems are those promoted by organics, and that these produce food in a safe and environmentally sensitive way which benefits the entire ecosystem (p.7).*

Within these passages the Nelson GE Free Awareness Group are questioning the worth of GE. By suggesting that it 'is all about experimentation' the Nelson GE Free Awareness Group is implying that GE is experimentation for the sake of it, rather than research to provide what the Nelson GE Free Awareness Group see as any useful tools or products for the future. These implications about GE are juxtaposed against those related to organics in the second passage, in which organics is presented as producing food that replenishes the environment. All the groups refer to organics, even though not all of the groups use the word 'sustainable'. Els Wynen, (1996) states that such interchanging of terms is common noting that organic, biological, ecological and sustainable, agriculture are used to describe similar practices by different groups and this is particularly evident when people from different communities are discussing these holistic agricultural methods. This is not to suggest that all of these practices are identical.<sup>77</sup> but to highlight that these practices can be considered as holistic agricultural practices which rely on notions of closed systems as opposed to the appropriationism.<sup>78</sup>

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<sup>77</sup>. For example, for a discussion on the contested notion of 'organics' in Aotearoa New Zealand see Muscat (2001).

<sup>78</sup>. Appropriationism is the process of undermining the cycles of agriculture by transforming them into discrete elements for industry, thus minimising the role of nature in agriculture (Goodman, Sorj, & Wilkinson, 1987).

and substitutionism<sup>79</sup>. inherent within reductionist chemical agriculture (see Goodman, Sorj & Wilkinson, 1987; Rogers-Hayden, 2000; Shiva, 1993; 1994).

The extent to which this vision of agricultural sustainability contrasts with Progress is emphasised in the following passage by the Environment and Conservation Organisations of New Zealand (2001) when they suggest that it is desirable to have a '[m]inimisation of the environmental impacts of human activity and the sustainable management of natural and physical resources' (p.3). They are highlighting the human relationship with the land, presenting a clearly oppositional trope to Enlightenment thinking in which the land has no intrinsic value and is merely a resource to be exploited for capital gain.

The environmentalists' narratives on sustainability therefore relate closely to their visions for agriculture but the concept is much broader than this. Just as Beus and Dunlap (1990), and Wynen (1996), (see Chapter Five) have provided a paradigmatic presentation of organics in contrast to conventional farming, the environmentalists' vision encompasses more than just a farming method. From analysing the hundreds of pages of submissions from the environmentalists I do, however, conclude that this was not some seamless paradigmatic clash. Despite the breadth of the concept of 'sustainability' it is not synonymous with the new environmental paradigm or alternative agricultural paradigm. The environmentalists, in keeping with the NEP, do stress the placement of a high value on nature, compassion to future generations, avoiding the risks of GE, and limits to society's expansion, but these vary, especially

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<sup>79</sup>. This refers to the substitution of elements of a closed farming system with off-farm inputs. For example, purchasing synthetic fertiliser instead of composting (Goodman, Sorj, & Wilkinson, 1987).

with regards to the final element of the New Environmental Paradigm, the need for structural change. This is highlighted further with regards to the Alternative Agricultural Paradigm. The approaches all clearly stress harmony with nature, diversity and restraint. However, the need for decentralisation and independence vary greatly.

For example, organics is often proposed as the alternative to GE with potential export premiums being highlighted. The organics exporting sector in Aotearoa New Zealand has relied heavily on large companies such as Heinz-Wattie (Campbell 1997). Given this, one could question the degree to which a change to organics would facilitate radical structural change. In particular, what would organics become if based on comparatively large production demands? For example, demanding export orders may lead to lack of crop rotation to meet yearly targets for the same crop. In this sense organics may move closer to the mechanistic agricultural paradigm. 'Organics' may therefore become more product-based than process-based.<sup>80</sup> This point is stressed by Murray Bookchin (1991) in his discussion of ecological inventions. He states that

*. . . solar energy, wind power, organic agriculture, holistic health, and voluntary simplicity, will alter very little in our grotesque imbalance with nature if they leave the patriarchal family, the multinational corporation, the bureaucratic and centralised political structure, the property system, and the prevailing technocratic rationality untouched (p.61).*

Despite frequent reference to premium profits, this point that GE is more than a practice but a rationality in question, is highlighted in many of the environmentalists'

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<sup>80</sup>. A further example was discussed with Jo Muscat (personal communication, 2001) when she mentioned that some organic farmers in Aotearoa New Zealand fear the marginalisation of the spiritual dimension of their particular type of organic farming with the development, and possible future widespread acceptance, of a 'mainstream' accreditation criteria.

narratives. For example, in the following passage the Greens (2001) discuss the difference between this reductionist paradigm and sustainability.

*It is clear that current systems of agricultural production are not sustainable in the long term. High use of pesticides and fertilizers are having effects on soil and water quality and consumers are demanding lower or zero pesticide residues. There are two responses to these problems. The reductionist paradigm suggests changing the crop and plants and animals in order to continue our current overuse of soil and water and to control the pests and diseases which result largely from our cultivational methods. The ecological paradigm suggests making better use of natural sources of fertility, learning more about the life cycles of pests in order to outwit them, and working with the interactions between the species, such as companion plants and crop rotations to avoid the need for toxic substances (p.68-69).*

In this passage current technologies are presented as creating the problem of non-sustainability. These are presented not in isolation but as part of a non-sustainable 'system'. The Greens identify the 'GE solution' as a technological quick-fix in which nature is engineered—ever striving to build upon societal Progress. It contrasts this with the ecology (sustainability) approach which is presented as working with nature. This situates GE in a context of industrialised agriculture and a reductionist paradigm—somewhat counter to sustainability.

The extent to which sustainability as a concept challenges the notion of Progress is uncertain, yet the environmentalists' narratives have offered, to varying degrees, a vision that contrasts with that of Progress.<sup>81</sup> One of the attempts to clarify sustainability is through creating a more cohesive principle for society and it is to this I now turn.

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<sup>81</sup>. In keeping with the theoretical approach of this study I am not meaning to imply that the differing nuances in the environmentalists' narratives, in regards to their varying expressions of need for structural change, is a problem *per se*. I see this as highlighting the construction of environmentalism in action—which contrasts with dogma.

### 7.3 Proposing the Precautionary Principle

It is often suggested that the precautionary principle (PP) provides the guidelines for sustainability (Deville & Harding, 1997; Dovers & Handmer 1995). But, just as I have argued with respect to the contested nature of sustainability, it will be necessary to explore the contestation over the PP as the environmentalists' propose the implementation of the PP for Aotearoa New Zealand. O'Riordan and Jordan, (1995) discuss this issue stating that:

*Like sustainability, the precautionary principle is neither a well defined concept nor a stable concept. It has become the repository for a jumble of adventurous beliefs that challenge the status quo of political power, ideology and civil rights. Neither concept has much coherence other than it is captured by the spirit that is challenging the authority of science, the hegemony of cost-benefit analysis, the powerlessness of victims of environmental abuse, and the unimplemented ethics of intrinsic natural rights and inter-generational equity (p.191).*

The precautionary principle—since its inception, as *Vorsorge* (foresight) in Germany over 20 years ago—has gained increasing popularity, as environmental problems globally have worsened, and has been incorporated into various treaties, declarations and laws (Barrett, 2000; Barrett & Flora, 2000). The principle aims to shift the burden of evidence from the public onto developers to prove that their product, technology or substance, will cause no unreasonable harm to the environment. It has been suggested that its original application was in 1984 at the First Ministerial Conference on the North Sea. Although originally conceived with regard to marine pollution prevention, its use now spans many environmental and health domains including the management of GMOs (MacGarvin, 1993). The precautionary principle's popularity further increased after its inclusion in the Rio de Janeiro Declaration of 1992, in tandem with its

inclusion in Agenda 21 which outlines the actions that need to be taken to achieve sustainable development (Douma, 1996). With respect to GE, it was more recently applied in the Cartagena Biosafety Protocol in Montreal in 2000 in the context of international transportation of live modified organisms (see Barrett, 2001), and, as mentioned previously, the PP has been included in regulations on the release of GMOs in Europe and Australia. It is significant to this discussion as it was recommended to the RCGM by the environmental groups in Aotearoa New Zealand as a useful option for the management of GE.

### **7.3.1 The Precautionary Principle or Approach?**

The importance of the PP as a trope, in the RCGM forum, is signified by all six environmental groups proposing the adoption of precaution for the management of genetically modified organisms and genetically engineered foods. Friends of the Earth (2001) make the PP a feature of its presentation as the first line of its executive summary states: ‘The theme of our submission can best be summarized in the precautionary principle’ (p.1).

Five of the groups specifically refer to the ‘precautionary principle’ in their submissions, while one group, the Environment and Conservation Organisations of New Zealand (2001), refers to the ‘precautionary approach’.

*ECO advises a precautionary approach—where an activity raises threats of harm to the environment or human health, precautionary measures should be taken even if certain cause and effect relationships are not established scientifically (p.44).*

Despite this being ECO's (2001) definition of the precautionary approach, it is virtually the same as the 'January 1998 Wingspread statement of the Precautionary Principle'.<sup>82</sup>:

*When an activity raises threats of harm to human health or the environment, precautionary measures should be taken even if some cause-and-effect relationships are not established scientifically* (cited in Tickner, Raffensperger & Myers, 1999).

The only differences are that ECO use 'where' instead of 'when' and change the ordering of harm on 'human health or the environment' to the 'environment and health'—prioritising the environment.

### 7.3.2 What Precaution Would Mean

Despite references to the 'precautionary approach' and 'precautionary principle' all of the environmental groups are in consensus on what taking 'precaution' would mean for Aotearoa New Zealand in regard to GMOs and their field testing. They all suggest that the use of precaution would prevent the release of GMOs into the environment, and restrict field-testing to strict laboratory containment. The following passage by the Greens (2001) is representative of all the groups' sentiments.

*In accordance with the Precautionary Principle, we call for a ban on the release of all genetically engineered organisms (GEO) and the planting or field testing of all genetically engineered crops into the environment, including those now approved. We urge that where there are safer alternatives to the use of*

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<sup>82</sup>. The Wingspread statement was a call to governments to adhere to the PP from a group of PP conference participants. A three-day conference was held at Racine, Wingspread, in the United States of America, to define and discuss implementing the precautionary principle. Participants included treaty negotiators, academics, activists and scientists from the United States, Canada and Europe (Mon, 1981; Raffensperger, 2003; Sonnenfeld, 1998).

*GEOs, these technologies should be given preference, particularly the promotion of organic agriculture (p.67).*

In order to ‘unpack’ what the environmental groups are proposing by recommending precaution I will now analyse their narratives on the PP according to its key aspects. This will be helpful in elucidating the extent to which the environmentalists’ PP offers an alternative to the hegemonic values found in the tropes of the bioproponents.

Despite a variety of definitions of the precautionary principle in circulation, Katherine Barrett (2000) suggests that there are five core elements found in all definitions of the concept. These five elements, free from any ranking of importance, are:

- 1 Protecting the environment and public health;
- 2 Considering alternatives;
- 3 Creating open, informed and democratic decision-making processes;
- 4 Shifting the burden of proof to the developers; and
- 5 Taking proactive measures even in the face of scientific uncertainty.

For the environmental groups, the **first element** of the PP, protecting the environment and public health, is the highest priority and this features clearly in all their submissions. The sentiments expressed by GE Free New Zealand (2001) in the following passage highlight this.

*We consider that it is dangerous and extremely unwise to allow such hazards into the food chain. The potential for disease creation is too great. We consider that the potential threats to human health we have discussed in this submission to be immense. We oppose the introduction of genetically engineered foods or their derivatives into the human or animal food chain. In addition, GE Free New Zealand considers that the potential risks to the environment from the release of genetically engineered plants, crops, and animals is unacceptable. . .We oppose the introduction of all and any genetically engineered crops, plants and animals into the environment because*

*of the unacceptable level of risk this would pose and because of the irreversible nature of this technology in agriculture (p.2).*

The potential threat to the environment and human health is central to implementing the PP. Genetic engineering is seen by environmentalists as a classic case for taking precaution as it involves both criteria for invoking precaution—the threat of harm and scientific uncertainty (Ho, 1998; Traavick, 1999; Rogers-Hayden, Hindmarsh & Risely, 2002; Wills, 2001b).

The **second element** of considering alternatives is evident in the proposal for a GE-free organic nation as an alternative to using GE. Organics is presented by all the environmental groups as the ultimate in precaution. Sol Morgan (2001), from Nelson GE free Awareness Group, summarises:

*Organic[s] is the functional manifestation of the precautionary principle. Conventional production is based on the exact opposite belief—namely, we must conquer and control nature, even at a cellular level (p.3).*

Precaution is presented as oppositional to a modernist relationship to nature and this oppositional relationship is seen as inherent within the alternative to GE—organics.

The relationship between precaution and alternatives is elaborated upon in the following passage from Friends of the Earth's (2001) submission.

*We also believe that the avoidance of GM technology in medicine and the division of health funding away from GM technology would create an incentive to develop other, non-GM medicines and treatments which may be at least as effective and at the same time not place life on Earth at risk (p.10).*

Precaution is presented as enabling the creation of safer alternatives and this challenges the notion of autonomous sciences leading to Progress. It is not science that is seen as having one path but funding that is presented as restricting possibilities.

**The third element**, of open informed democratic decision-making, featured throughout the submissions. The importance of democratic decision-making is evident in the representation of GE as a technology that is in Aotearoa New Zealand against the wishes of the public. Nelson GE Free Awareness Group (2001) recommends a public referendum suggesting that: ‘It is the peoples (sic) democratic right to say no to this technology’ (p.22). It suggests that it is not industry or government that should decide but lay people, and these lay judgments are of the highest importance—challenging the centrality of scientists to decision-making on GE.

Friends of the Earth (2001) also challenges expertise suggesting that neither science nor any other singular value system can be used to justify GE.

*Therefore it is the position of Friends of the Earth New Zealand that the decision to alter, or to risk altering, human and other genomes is one which no-one, no matter how well-versed in scientific, cultural and ethical matters, should make on behalf of the rest of humanity (p.28).*

However, the Friends of the Earth passage takes this argument of democratic decision-making beyond the idea of a referendum by proposing that *no-one* is in a position to approve GE. The implication is that no level of specialised knowledge gives anyone permission to decide on the fate of humanity. Accordingly from this perspective GE cannot go ahead.

The **fourth element** is shifting the burden of proof, which is one of the key elements of the PP. For environmentalists this is the element of the PP that has the potential to change their position to environmental issues. Rather than having to come from a reactive position and prove through science that damage has occurred (see Chapter Five), this element of the PP would enable environmentalists to highlight potential harm and prevent damage from happening—without waiting for scientific evidence of the causal link.

All six of the environmental groups portray the PP as disputing the need for scientific proof, and accordingly they are unanimously questioning the usefulness of the scientific paradigm for the environment. Environment and Conservation Organisations of New Zealand (2001), although not mentioning PP in the following passage, implies that society cannot rely on scientific proof. In its discussion of liability issues it suggests that:

*There is scientific evidence that Round up (sic) is damaging to the environment and to human health, yet it is still sold, simply because we do not have the ability to absolutely prove that any one individual's (sic) cancer was caused by only one factor. This will be true of genetically engineered products as well and science cannot answer all the questions (p.20).*

Similarly, GE Free New Zealand (2001) promotes the PP as an alternative to scientific evidence.

*Some estimates now suggest that incidence of [Creutzfeldt-Jakob Disease] CJD.<sup>83</sup> will reach epidemic proportions in Britain and the [European Union] EU by the year 2015. The parallels with genetic engineering of food are*

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<sup>83</sup>. CJD is a fatal neurodegenerative disease. It is thought to be transferred to humans through eating the meat of cows which are infected with Bovine Spongiform Encephalopathy (BSE), commonly known as 'mad cows disease'. Bovine Spongiform Encephalopathy is a similar disorder in cattle which is thought to have developed from feeding of scrapie-containing sheep meat-and bone meal to cattle. The vast majority of cases of BSE and CJD have been reported in the United Kingdom where it was first described (National Centre for Infectious Diseases, 2003).

*striking..<sup>84</sup>. Governments took the advice of individuals who were committed to the biotechnology paradigm. They hoped that it will be safe but no long term studies had been done. Instead the 'precautionary principle' should be applied. Rather than saying 'No one had proved that it is unsafe, the burden of proof should be on the manufacturers to prove that it is safe. In any case, there is already enough accumulating evidence to give good grounds to know that GE foods are very unsafe (p.20).*

The PP in proposing that the burden of proof should be shifted from environmental groups to developers of technologies thus challenges the current construction of science. As Wynne (1992) states, '[t]he different social premises which that shift implies also open up the possible reshaping of the natural categories and classifications on which that scientific knowledge is constructed' (p.112). While the traditional view of science is that science can solve all problems, or at least provide dependable quantification of the risks, the PP rejects such optimism (Dovers & Handmer, 1995). Risks, like those of GE, are seen as beyond mere calculation (Beck, 1992a; Otway, 1992). They escape temporal and spatial fixivity (Beck, 1992a; Dovers & Handmer, 1995) and therefore waiting for evidence of harm before taking action is seen as unwise.

As it is not possible to quantify the risks, society must make decisions about these technologies under 'scientific uncertainty'. The acknowledgment of uncertainty is the **fifth element** of the PP. Terje Traavik (2001), on behalf of Friends of the Earth, identifies uncertainty as necessitating the implementation of the PP as an alternative to previous systems of risk management.

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<sup>84</sup>. Ten years after CJD was identified the British Government announced that there was probably a link between CJD and BSE. It has been reported that the government knew of the probable threat to human health but failed to take action (Assinder, 2000).

*Hence, the present state of ignorance makes scientifically based risk assessments impossible. This calls for invoking the 'precautionary principle' (p. 7).*

The PP is presented in contrast to traditional risk assessment in which cause and effect can be identified. Science's centrality to risk assessment therefore contrasts with the PP's acknowledgment of scientific uncertainty. Furthermore, by discussing ignorance Traavik (2001) is proposing that it is not possible to know what is not known (see Chapter Two).

This idea is extended by Ann Clarke (2001) on behalf of the Greens.

*Will research alleviate these concerns. (sic) What, in fact, would one study, when so many of the effects are completely unpredictable . . . If ever there were a case for invoking the precautionary principle, this must be it (p.12).*

This type of uncertainty is therefore not merely a lack of answers by scientists, but the impossibility of knowing what questions to pose when researching the risks. Clarke (2001) is describing uncertainty in a state of indeterminacy (see Deville & Harding; 1997; Wynne, 1992).

The PP therefore contrasts with its predecessor, risk assessment. While risk assessment is based on the notion that science can provide definitive answers on risks, the PP is constructed on the notion that there are risks to which scientific investigation is not applicable as an approach. In addition to the differences between risk assessment and the PP there are also implementations of the PP that blur the line between risk assessment and the PP often causing confusion when discussing the issue. This is further explored in the following chapter when I 'unpack' the way the bioproponents met this PP challenge.

To summarise, the environmental groups use science—highlighting the social advantages of relying on science. At the same time they expose what is commonly thought to be a neutral method to be a culturally specific mechanistic system. It is accordingly seen not as autonomous but as purchased by industry and eliding alternatives. It follows that the continued reliance on the scientific value system marginalises alternative value systems including that of the publics and as a result science is seen as anti-democratic. This means that the results of science are seen not as leading to progress but to the further entrenchment of a value system that is based on the exploitation of nature.

When sustainability is elaborated upon, it becomes apparent that science is no longer seen as providing authoritative advice but as incapable of providing evidence on which to base policy. It follows that preventative action should be taken against incalculable, serious and irreversible risks. Accordingly, it is not scientists who should decide on the use of GE but the publics. It could be seen that sustainability challenges Progress by proposing a re-ordering of the relationship between humans and nature to that which exists through science.

However, as discussed, the challenge presented to modernist thought is not necessarily implicit within the use of sustainability, and the role of the PP in protecting the environment is contested. These points are expanded upon in the following chapter when I deconstruct how the bioproponents meet this challenge to the hegemonic tropes.

## 8

## MEETING THE CHALLENGE

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In the previous chapter I examined the environmentalists' challenges to the hegemonic narratives presented by the bioproponents through their use of science, and discussions on sustainability and the precautionary principle. Sustainability and the precautionary principle are not, however, exclusive to the environmentalists' narratives but also feature in those of the bioproponents. In this chapter I argue that the bioproponents' responses can be seen as the final shaping of the RCGM narratives. This will be clarified further in the following chapter where I will explain how the contestations discussed in this chapter are mirrored in the RCGM's findings.

I have titled this chapter 'meeting the challenge' as faced with environmentalists' creation of a utopian 'sustainability' narrative, and the construction of this vision into a tenet called the precautionary principle, the bioproponents are faced with a challenge to their utopian vision of experts using neutral science to create Progress. Their responses in this chapter can therefore be seen as them 'meeting the challenge'.

It has been claimed that although at first industry generally vigorously oppose environmentalists' notions, over time they appropriate these terms as the optimal defence against environmental critique (Doyle & McEachern, 2001). Dryzek (1997) emphasises the internationality of this co-optation when he observes that: 'Perhaps

more than simply resisting environmental values, recalcitrant actors will try to cloak themselves in the language of environmentalism' (p.11). This is not, however, meant to imply that there is simply a clear line between environmentalism and industry. As discussed in Chapter Five, the very nature of environmentalism is contested and some people/groups may adhere to a technocratic model while still promoting environmental values as part of their interventionism. O'Riordan (1989) emphasises that sometimes those following a technocratic model actually believe they are environmentalists.

Similarly, group affiliations, although often helpful to a reader/listener for placing a person's perspective, are not always useful for distinguishing approaches. In the RCGM a founding member of Greenpeace, former President of Greenpeace Canada and past Director of Greenpeace International, presented evidence on sustainability—for the Life Sciences Network. This is Patrick Moore (2000) who is described by the New Zealand Life Sciences Network (2000) as providing evidence on: 'Environmental issues and the environmental movement's opposition to GM' (p.6). The engagement of renowned environmentalists by industry to discredit environmental notions is not unique to the RCGM (see Rowell, 1996).

Instead of merely fighting against environmental notions industries often present themselves as the 'true' environmentalists. 'Corporations have also set out to persuade the public that the very *raison d'être* of commerce has changed, and to co-opt the environmental debate' (Rowell, 1996, p.100). The use of sustainability by both the environmentalists and the bioproponents in the RCGM forum illustrates this issue. The precautionary principle has been similarly contested regarding GE although this is not

the case in the RCGM. What is elucidated by the environmentalists and the bioproponents engagement with both of these terms is the construction of these narratives as found in the RCGM report. For this reason I will explore the bioproponents' reactions to sustainability before examining how they engage with the PP.

## 8.1 Sustainability

Sustainability, as noted, is often referred to by the bioproponents in the RCGM. The aforementioned NZLSN witness, Moore (2000), concentrates on this issue, while the following passage by Aventis CropScience (2000) illustrates the centrality of 'sustainability' to its organisation.

*In Aventis, our challenge is life and we are driven by the global needs for food safety, sustainability, and a cleaner environment. When we look to the big picture, we understand that biotechnology and GM foods will play a critical role in feeding the world's population of 9 Billion by 2025 (p.1-2).*

Sustainability is presented as one of the principles behind Aventis, which it is 'driven' by. As GE will 'play a critical role' in fulfilling its mission it follows that genetic engineering must be a sustainable practice. If it were not sustainable, GE would be undermining its mission. Furthermore, Aventis CropScience is implying that it is an organisation created for the benefit of the earth and humanity as it lists food safety, sustainability and a cleaner environment but does not mention profit as a motivating factor for the business. It appears to be a philanthropic institution.

Despite the recent use of sustainability by the bioproponents in the RCGM, it would be misleading to present industry as only recently reacting to the environmentalists' use of this term. The Business Council on Sustainable Development<sup>85</sup> was formed in 1991 in anticipation of The United Nations (UN) Conference on Environment and Development Earth Summit in Rio de Janeiro in June 1992. Sustainability was by this time a popular notion, and the invitation to participate in the Summit was given by Maurice Strong, the Secretary General of the Summit. By 1995 the Business Council on Sustainable Development comprised of 130 of the world's largest corporations, including Shell Oil and Dupont, and was chaired by chief executive members of British Petroleum (BP) (Dryzek 1997). Industry was consequently an influential force in the Earth Summit. Michael Fox (1999) suggests that despite this apparent contradiction, companies such as Monsanto and DuPont were central to the development of a 'corporate and government consensus' on sustainability that emerged from the 1992 Earth Summit (p.187).

### **8.1.1 GE is Sustainable Agriculture**

As highlighted above, GE is presented by the bioproponents as part and parcel of a sustainable future. However there is an obvious difference in the meaning of the term as used by the bioproponents and environmentalists, which is based on the role of GE in a sustainable society. In the following passage Aventis CropScience (2000)

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<sup>85</sup>. In 1995 The Business Council on Sustainable Development merged with the World Industry Council for the Environment to form the World Council on Sustainable Development (WCSD) (Personal e-mail, Geneviève Tremblay, 21 October 2003). For further details on the WCSD see World Council on Sustainable Development, 2003.

discusses the probable impacts of a moratorium on GE suggesting that sustainability would suffer.

*Furthermore the advantage to the environment of more sustainable, environmentally sound farming practices which enable greater yields from less land and better management of pests and diseases will also be unavailable (p.3).*

A GE free country would reduce sustainability according to Aventis CropScience. Genetic engineering is presented as synonymous with sustainability, in a similar way to its presentation as synonymous with organics by environmentalists as discussed in the previous chapter. Genetic engineering is seen as sustainable due to the possibility of increased yields from land and pesticide resistant crops.

It is clear that despite the acceptance of sustainability as a goal, and a farming practice, there are polarised perspectives on how it is to be achieved (Collier, 1999; Hindmarsh, 1982). Genetic engineering, the bioproponents suggest, is an improvement on the herbicide and pesticide reliant agricultural practices that replaced traditional forms of organic agriculture with the Green Revolution. Levidow (2000) details how the term sustainability in relation to GE has previously been successfully challenged in the United Kingdom. In 1998 Monsanto produced an advertising campaign claiming that among other things GE crops were more environmentally friendly than non-GE crops. The Advertising Standards Authority upheld complaints against the advertisement and said that the company's claims were 'confusing, misleading, unproven and wrong' (cited in Levidow, p.321). Hindmarsh (1991) further describes the contradiction in sustainable genetic engineering when he states that:

*Clearly, the industry's promises that these uses of genetic engineering offer sustainability are either naive and confused, or just 'doublespeak' aimed at*

*deceiving the public in the interests of those who stand to profit from the new technologies (p.202).*

### 8.1.1.1 Organic Genetic Engineering

Although the bioproponents' notions of sustainability contrast with the environmentalists', they argue that these visions are not as different as the environmentalists suggest. Consequently, according to the bioproponents there is no need to choose between GE and organics. The New Zealand Life Sciences Network implies that not only is GE a form of sustainable agriculture but it is 'part and parcel' of what is presented by the environmental groups as the ultimate form of sustainability—organics.

*The methods of organics and conventional farmers have converged . . . Rather than resist these developments certifying organisations should accept that genetic modification may enhance organic farming practice and incorporate the new techniques (p.34).*

This passage implies that not only can GE and organics co-exist, contrary to the environmentalist propositions, but the organics industry should embrace GE as a form of organics. One could see this as an extreme form of co-optation in which not only is the broad category of sustainability used to describe GE but so too is the very practice that generally contrasts multinational appropriationism and substitutionism. Despite the apparent contradiction in being organic and genetically engineered the idea cannot be dismissed as too outrageous to be taken seriously, as it has already 'gained ground' in the United States of America. Marc Lappé and Britt Bailey (1998), in their coverage of the corporate control of the food system, note that regulations in the U.S.A 'will

permit limited use of the phrase ‘organic produce’ to be applied to genetically modified food crops . . . .’ (p.10).

### 8.1.2 Beyond Agriculture

The bioproponents’ use of the term sustainability is not limited to agricultural practices. Just as both the bioproponents and the environmentalists stress the importance of sustainability, both groups’ submissions and witness briefs present sustainability as a broader concept than agriculture. Aventis CropScience (2000) state that:

*Gene technology strategies can benefit all levels of Government (health, agriculture, trade industry, educational and tourism) whilst encouraging sustainable environmental and business practices (p.28).*

Aventis CropScience presents a wide definition of ‘sustainability’, and also a broad definition of government, by claiming that GE could improve health, trade, education and tourism. Moreover, it is suggesting that sustainability includes maintaining sustainability of its business practices—the market for Aventis CropScience GE products. This use of sustainability to mean ‘successful’ business practices is not a unique use of the word as it has similarly been argued that oligopolistic control of the world market is the meaning of sustainability for multinational petrochemical companies (Fox, 1999).

### 8.1.3 Progressing Sustainability or Sustaining Progress?

The emphasis on sustainable profit margins links sustainability to the notion it is said to challenge—Progress (see Chapter Six). Clive Holland (2000), in his witness brief for Dupont New Zealand, emphasises the importance of Progress to sustainability.

*New Zealand must remain open and receptive to new technologies. To not do so is choosing the backwaters of progress as well as positioning the agricultural industry in an increasing global disadvantage. Biotechnology is critical to achieving a more sustainable future for people everywhere, including New Zealand (p.5).*

Genetic engineering is seen as the key to achieving both Progress and sustainability. The implication is that choosing not to use GE is choosing to go into the ‘backwaters of progress’, and hence GE will provide Progress. The newness of GE is emphasised, as is the notion of a sustainable future. It could be suggested that Progress and sustainability are being presented as synonymous—sustainability as sustained Progress.

Simon Bourke and Tony Meppem, (2000) argue that sustainability is not necessarily a challenge to Progress.

*As a concept ‘sustainability’ relies on the strength of its affiliated terms, ‘support’ and maintenance . . .and only the slightest semantic shift allows ‘sustainability’ to be read not as a principle for change, but as a rationale for ‘supporting’ and ‘maintaining’ existing policy stances (p.303).*

Such a ‘reading’ of sustainability as described by Holland above could condone continued (sustained) levels of environmental degradation, as there would be no increase in the environmental exploitation. Likewise sustainability, as presented by the bioproponents in this section, could allow companies to strive for increased yields through GE and sustainable Progress.

## **8.2 Contesting the Precautionary Principle**

As with sustainability, the bioproponents engage with the PP discussing it at length in their submissions and witness briefs. The extent of the bioproponents' dedication to discussing the PP can be seen in the New Zealand Life Sciences Network having called a witness, Julian Morris, to concentrate solely on the PP. Within the submissions to the RCGM, the bioproponents deliberate on whether a meaning for the PP exists, proposing that there are multiple definitions including contrasts between the PP and the precautionary approach. I suggest that commonalities can be found between the multiple meanings of the PP and liken the discussion on the PP and precautionary approach to the differences between the strong and weak PP, highlighting the relationships between these types of precaution and risk assessment. The discussion is pertinent to the final aspect of the bioproponents' contestation of the precautionary principle that I address. This is the fall-back suggestion that if Aotearoa New Zealand does not reject the PP idea as recommended it should adopt a similar form of PP to that found in Australia's Gene Technology Act 2000.

### **8.2.1 Multiple Meanings?**

One of the most common criticisms of the PP is that a variety of meanings exist. The multiplicity of PPs is seen by some as the most significant problem facing its implementation as a policy tool (Foster, Vecchia, & Repacholi, 2000). It is noteworthy that such fluidity runs against the method of replicable processes found in science. A

number of submissions and witness briefs by the bioproponents highlight the numerous types of PP. Its fluidity in meaning is noted especially with regards to international legislation, and also because of the differences they identify between the PP and precautionary approach.

Concerning the variety of meanings of the PP, Klaus Ammann (2000) in his witness brief for the NZLSN suggests that:

*One of the basic problems of [the] PP is that there is no such thing as an overall definition; the application of [the] PP depends always heavily on the context (p.6).*

Ammann can be seen as questioning the worth of calling for the PP when it is not a self-explanatory concept. He appears to be attempting to discredit the usefulness of the PP by suggesting that it is inherently vague. This is made clear in the passage by stating that it is a 'basic problem of the PP', because rather than seeing it as a problem of implementation he is suggesting that the PP itself is problematic. Moreover, the use of the words 'no such thing' implies that he is responding to claims that there is a universal meaning to the PP. By suggesting that the 'application of the PP always depends heavily on the context' he is proposing that this is not acceptable and instead the PP should be a fixed concept to be applied to any situation. This is presented as a reason why the PP cannot be applied rather than a positive attribute of it.

Indeed, within the body of literature on the PP, no strict rules for the implementation of the PP can be found (Deville & Harding, 1997). Because strict procedural phases are seen as neither possible nor desirable the PP is generally posed as a 'guideline', in

either a 'weak' or 'strong' sense.<sup>86</sup> General PP frameworks are available to offer guidance in a variety of situations.

The multiplicity of meanings of the PP in existing legislation is discussed by Morris (2000) in his witness brief for the NZLSN. He highlights the variety of definitions of the PP and explores what he sees as the contradiction of there being an assortment of PPs in effect internationally. He presents three types of precautionary principle. First he introduces the PP as presented by Jeremy Leggett of Greenpeace in *Global Warming: The Greenpeace Report* (1990). Second, he discusses the January 1998 Wingspread statement on the PP, and finally, he addresses principle 15 of the 1992 United Nations Conference on Environment and Development (the Rio Declaration).

*Leggett's version (prove harmlessness): would ban biotechnology but it would also ban every other technology, including all forms of agriculture . . . The Wingspread version (consider all options; consult everyone): would take an infinite amount of time and resources to come to a conclusion . . . The Rio Declaration version (lack of cause-effect relationships not necessarily a reason to avoid taking cost-effective measures to prevent possible harms to health and environment): would neither mandate nor reject GM (p. 21).*

Leggett recommends the PP in *Global Warming: The Greenpeace Report* (1990) by stating that: 'The *modus operandi* we would like to see is: 'Do not admit a substance unless you have proof that it will do no harm to the environment—the precautionary principle' (p.459). He is concentrating on shifting the burden of proof from the public having to prove a technology/substance is harmful to industry having to prove their invention is safe.

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<sup>86</sup> The difference between the weak and strong PP is that the weak PP often relies on scientific judgment while the strong PP is often enforced on the grounds of scientific uncertainty. A fuller discussion on the differences follows in section '8.2.4 Debating Strong and Weak Precaution' p. 198-201.

The Wingspread statement on the Precautionary Principle (as quoted in Chapter Seven)

is:

*When an activity raises threats of harm to human health or the environment, precautionary measures should be taken even if some cause-and-effect relationships are not established scientifically* (cited in Tickner, Raffensperger & Myers, 1999).

Ironically, as mentioned in Chapter Seven, this statement was produced as an attempt to define the PP. The Wingspread conference participants believed that risk assessment and cost-benefit analysis had failed to protect the environment and human health (Mon, 1981; Raffensperger, 2003). Hence this statement, like Leggett's definition of the PP, was an attempt to shift the benefit of doubt from industrialists to environmentalists. Furthermore, the statement was a recommendation for a new principle, for carrying out human activity, due to the magnitude and seriousness of global problems (Mon, 1981).

The final PP addressed by Morris (2000) is the version in the Rio Declaration which states that:

*Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation* (cited in the Royal Commission on Genetic Modification, 2001a, p.65).

Like the previous two definitions of the PP, the Rio statement also stresses shifting the burden of proof by suggesting that full scientific certainty is not the prerequisite for taking action. However, the difference with this statement is that in stating the need for 'cost-effective measures' it once again invites cost-benefit analysis to be part of the equation (see also Foster, Vecchia, & Repacholi, 2000).

Morris is not alone in highlighting the variety of PPs in circulation, as one analyst found 14 types of PPs in treaties and non-treaties (see Foster, Vecchia, & Repacholi, 2000). The PPs presented by Morris (2000) all however, stress the need to shift the burden of proof but differ in regards to the need for these to be ‘cost-effective’.

The final aspect of the bioproponents narrative on the multiple meanings of the PP I wish to highlight concerns the difference between the PP and the precautionary approach. As discussed in Chapter Seven the environmental groups refer to both the PP and the precautionary approach. Aventis CropScience (2000) differentiate between the two when it states that:

*Common issues under discussion include: liability and insurance with respect to gene flow issues, role of the precautionary principle versus the precautionary approach to risk assessment and its inclusion in the object of legislation . . . .*  
(p.20).

The PP is presented as more specific than the precautionary approach. It appears to be suggesting that the precautionary approach can be used with contemporary risk assessment practices, while the PP is an alternative to risk assessment and management. Collapsing the (weaker) PP into existing risk analysis is a common approach by those wanting reduced risk regulations and barriers to trade (Barrett, 2000). These notions center around the concepts of risk and uncertainty.

### **8.2.2 No Uncertainty and No Need for Precaution**

The risks associated with GE and GE’s relationship with precaution are vigorously contested by the bioproponents. The proposed benefits of GE are purported as opposed

to the risks, and caution, as opposed to risk-taking, is questioned. Adolf Stroombergen (2000) for the NZLSN proposes that the threat of harm cannot be justification for invoking the PP as GE also offers potential benefits.

*If a perceived threat also has an upside, or if the proposed forestalling measures also have a downside, the precautionary principle falls over (p. 14).*

Stroombergen is proposing that the PP is only applicable to situations in which the sole risks from the proposed action are to the environment. Instead he suggests that as there may also be benefits from the proposed action, or risks from forestalling the proposed action, the PP is not helpful. Hence the passage implies that the risks of not proceeding with GE may be greater than the serious irreversible damage implied by invoking the PP.

Similarly Moore (2000) for the NZLSN suggests that the risks should be compared to the benefits (risk-benefit analysis). Moreover, he proposes that there is always risk and uncertainty and therefore caution rather than precaution should be taken.

*There are so many real benefits from genetic modification compared to the largely hypothetical and contrived risks that it would be foolish to place a total ban on genetic modification. There is no such thing as zero risk so it is important to proceed with adequate caution (p. 2).*

Moore is attempting to discredit the PP by establishing a 'straw person'. He proposes that proving 'safety' entails 100% certainty, then he establishes that 100% safety is impossible. As Burton (1995) states: ' . . . this is logically impossible—there can be no absolute proof that an activity or substance is completely safe' (p.236). Moore's discussion is an argument against shifting the burden of proof. As bioproponents cannot provide 100% safety they should not be required to provide evidence that the creations will not harm the environment or human health.

It is interesting that the notion of 'caution' is introduced as different from precaution. While precaution is presented as avoiding risks caution is presented as taking considered risks. It appears that although taking precaution (avoiding risks) would mean not proceeding with GE, it appears that the nation could still proceed with GE with caution. I, together with Hindmarsh and Risely (Rogers-Hayden, Hindmarsh & Risely, 2002), have previously highlighted the increasing use of 'caution' in governmental documents in my work when we discussed of the marginalisation of the strong PP in favour of the weaker cautionary PP in Australasia.

Caution as an alternative to precaution is further discussed with regards to the role of science in risk and uncertainty. In its section on strategic options the New Zealand Life Sciences Network (2000) states that:

*[The s]tarting point for coming to a rational conclusion on this question is the degree of cautionary control we need to exercise over future decision making . . . . [This] degree of caution should be consistent with the scientifically established degree of risk using an appropriate process, which weighs risks against benefits (p.63).*

The NZLSN proposes that caution should be governed by science. This could be seen in opposition to precaution, which offers an alternative to relying on science. A cautionary approach is presented as 'rational' in which risks and benefits can be accessed and directly compared. Such an approach to scientific risk-benefit analysis is indeed in keeping with the traditional use of the word 'rational' (see Chapter Four). Risks are seen as able to be quantified as indicated in the words 'the scientifically established degree of risk'. Scientific uncertainty is thus denied.

It follows that the PP should be rejected in favour of cautionary risk assessment. These sentiments are expressed in the following passage, also by NZLSN (2000).

*The network submits . . . [that] uncertainty is reduced by science and that current public uncertainty is the result of public concerns which have been highlighted and heightened politically. Unfortunately, present opposition to GM is not based on careful scientific assessment of risks. We need more certainty, more confidence in regulators and scientists (p.5).*

Science is presented as able to overcome uncertainty. This is because uncertainty is not perceived as scientific uncertainty, something science cannot investigate, but as uncertainty about the benefits of GE. The New Zealand Life Sciences Network states that opposition to GE 'is not based on careful scientific risk assessment' and hence the implication is that objections are unfounded as the remedy is more faith in regulators and science. It follows that objections to GE are due to a lack of scientific knowledge, and acknowledging the uncertainty in policy such as implementing the PP would merely be bowing to political pressures against GE, rather than basing regulation on science. Such sentiments against the PP are described by MacGarvin (1993) when he notes that:

*Some scientists have a deep-rooted unease about the precautionary principle. To them it seems in some way wishy-washy, pandering to uninformed opinion, or running against a scientific method of dealing with the environment. The PP is thus seen as disrespectful of, and even to be undermining, science. Conversely, science is promoted, despite its imperfections, as the best opportunity available to gain insightful knowledge of complex interactions through vigorous trial and error. With the guidance of 'sound science', the risks are believed to be acceptable, while society's progress is threatened by 'playing it safe' (p.5).*

### 8.2.3 Rethinking the Precautionary Principle

Although most of the bioproponents' passages reject the PP, they also discuss ways to reconceptualise precaution and the difference between taking strong and weak precaution. Therefore if the PP did not get rejected as recommended there were further options available that could involve the PP and the development of GE in Aotearoa New Zealand.

Morris (2000) suggests that instead of discussing whether or not to implement the PP the way the PP is used could be rethought.

*In spite of the many problems discussed above it must be accepted that since the PP is already present in so many international agreements (including the Biosafety Protocol) and is being considered by the Codex Alimentarius Commission,<sup>87</sup> it is perhaps worth rethinking how the PP might be applied to the issue of GM crops (p. 22).*

The author appears to be suggesting that if one wants to use GE and the PP is already in international treaties then one has to find a way of rewording the PP to include GE.

Furthermore, Morris (2000) does not portray the PP and GE as mutually exclusive, as he states that the PP as such does not automatically mean the rejection of GE.

*Inasmuch as both unemployment and reduced income are significant harms, resulting in depression and even suicide, as well as lower life expectancies . . . it could plausibly be argued that the PP militates in favour of adopting agricultural biotechnology in New Zealand. However, others will argue that [the] PP justifies a continuation of the moratorium in New Zealand (p. 18).*

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<sup>87</sup>. Codex Alimentarius' was created in 1963 by the Food and Agriculture Organization of the United Nations and the World Health Organisation (Codex, 2003). The guidelines they produce are voluntary but are referred to by the World Trade Organisation in trade disputes. The Codex Alimentarius Commission undertook an investigation into the safety of genetically modified foods, as well as into appropriate toxin levels and guidelines for organic livestock, releasing their findings in July 2001 (World Health Organization, 2001).

Morris takes the basis of the PP (stopping serious and irreversible harm) and imaginatively applies this to unemployment. He is rewriting the PP from prioritising environmental and human harm to lost personal opportunities. This passage acts to problematise the PP by suggesting that it can be used by those supporting or critical of GE depending on the writer's values.

Ammann (2000) for the NZLSN also does some 'rethinking' of the PP debate, suggesting how it could be overcome by breaking the GE/organic distinction.

*Maybe we need some newly designed products which will fit to terms like: **Organo – Transgenic Crops and Organic Precision Biotechnology**. This vision would of course break up the present day harsh debate on the PP . . . (emphasis in original, p.12).*

This passage by Ammann, is similar to those discussed in the section on sustainability where the bioproponents were suggesting that it was not organics but GE that is the ultimate form of sustainability. The entire debate on the PP would cease if GE could be called 'organic'. This does seem to encapsulate what Morris (2000) described as rethinking how to work with the PP and use GE.

#### **8.2.4 Debating Strong and Weak Precaution**

Another way of approaching the PP is to negotiate the meaning of precaution through discussing the strong or weak PP. Morris (2000), who had proposed that the PP and GE were not mutually exclusive, also deliberates on why neither the strong or weak PP is workable.

*Two broad categories of PP are identified: Strong PP: 'take no action unless you can show that it will do no harm', and the Weak PP: 'lack of full certainty is not a justification for preventing an action that might be harmful'. The Strong PP would impose an outright bar on most technologies. The weak PP is much more ambiguous and, it is argued, does not actually amount to a coherent decision rule at all (p. 3).*

He discredits the PP altogether by proposing that the strong PP would stop all technology by waiting for full certainty, while the weak PP is seen as meaningless due to its flexible criteria. It is the role of science in addressing uncertainty that is often seen as the defining factor in differentiating between the strong and weak precaution (Barrett 2000; O'Riordan & Jordan, 1995). However, the weak PP is usually based on notions of 'sound scientific' decision-making and may incorporate elements of economic cost/benefit analysis. In contrast, the strong PP is often seen as operating on the notion of scientific uncertainty and therefore 'science plays little or no role in policy making: administrators undertake to go beyond science to address known, but still uncertain, threats to the environment' (O'Riordan and Jordan 1995, p.198).

It follows that a further factor separating the weak from the strong PP is the pro-active versus re-active nature of the policy. Strong interpretations tend to recommend taking preventative action to avoid harm, while weak interpretations tend to legitimise 'business as usual' with pre-approval of incremental cautionary measures regarded as the element of 'precaution'. Weak precaution can therefore be seen as narrowing the gap between the PP and its predecessor, risk assessment (Barrett, 2000).

In contrast to Morris' (2000) dismissal of the PP, Dupont New Zealand (2000) suggests that Aotearoa New Zealand implement the type of PP prescribed in Australia's Gene Technology Act 2000 (see Chapter One).

*DuPont commends to the Royal Commission's consideration the recent discussion in Australia, which has resulted in the Gene Technology Bill 2000.<sup>88</sup> being introduced into the Commonwealth Parliament recently. While that legislation was designed with the Australian federal system in mind, the principles in the Bill should be suitable for application in New Zealand, in line with other collaborative regulatory frameworks eg. [Australia New Zealand Food Authority] ANZFA (p.8).*

What Dupont New Zealand is proposing is the introduction of a weak form of PP into Aotearoa New Zealand. In the Gene Technology Act 2000, the PP was not incorporated into legislation. Instead the PP was only inserted into the 'Regulatory Framework to Achieve Object' section of the Act (Rogers-Hayden, Hindmarsh & Risely, 2002). This is important because the objects of the Act are often referred to for the 'feel' or 'spirit' of the Act. This interpretive process has the potential to be influenced by the PP not being an integral part of the legislation. Commentators have therefore questioned the extent to which the PP in the Gene Technology Act 2000 was intended to guide decision-makers (Hindmarsh & Risely, 2001). For example, in my work with Hindmarsh and Risely (Rogers-Hayden, Hindmarsh & Risely, 2002), we argue that:

*In these circumstances, the PP proffers a legitimising avenue to high-risk activities by providing a veneer of green morality while keeping at bay the intrusion of the strong PP, which would fundamentally challenge those activities, and arguably gain better environmental outcomes.*

This co-optation of the PP (Hindmarsh & Risely, 2001) in effect means 'business as usual', an approach reflecting Australia's history of biotechnology regulation which has been shaped by bioproponents' interests (see Hindmarsh, 2001).

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<sup>88</sup>. The Gene Technology Bill subsequently became the Gene Technology Act 2000, coming into force on the 21 June 2001.

As the Gene Technology Act 2000 was coming into force Australia was receiving applications for releases of GMOs into the environment. Julie Hill (1994), discussing the PP in Britain, suggests that the strong PP would mean the prevention of harm, so in a strict sense GMOs could not be released into the environment. However, similarly in Britain numerous releases of GMOs have occurred under the guise of the (weak) PP. Precaution there has meant that prior approval for release was sought from relevant regulatory authorities, where authorities were then to be notified if any unintended effects become apparent after its release.

In summary, rather than just oppose the PP, by highlighting that they could work with the PP to continue to develop and release GMOs into the environment, the bioproponents have highlighted the flexibility of the concept. This acted to reinforce their argument that the multitude of meanings of the PP means that its implementation would not be prescriptive of action.

The bioproponents therefore met the environmentalists' challenge of sustainability and the PP by suggesting that GE will be sustainable (Progress) and that the meaning of the PP is dependent on the values of the speaker. Instead, 'caution' should be taken as the nation proceeds to make Aotearoa New Zealand a sustainable GE nation. The Commissioners' response to this debate between the bioproponents and the environmentalists is provided in the following chapter.

## PART 3:

# BRINGING IT ALL TOGETHER

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*Only a society that awakens from the pessimism of the confrontational constellation and conceives of the environmental issue as a providential gift for the universal self-reformation of a previously fatalistic industrial modernity can exploit the potential of the helping and heroic roles and gain impetus from them, not to conduct cosmetic ecology on a grand scale but actually to assure viability in the future.*

(Beck, 1999, p.104)



**Figure Part 3.1: 'Envisioning'**  
Source: Biowatch South Africa (2003)<sup>89</sup>

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<sup>89</sup> I chose this picture for its multiplicity of possible interpretations. I like the futurist look of it; I think it looks like a metaphorical representation on the future being genetically engineered. On the one hand it portrays everything as made up of DNA, which is characteristic of the way bioproponents often discuss nature. On the other hand it also represents the 'whole' depicting inseparableness of technology from nature.

## 9

# Wrapping up the RCGM and Moving Beyond

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In the previous chapter I examined how the bioproponents met the environmentalists' challenge to their hegemonic vision through the co-optation of sustainability and rejection of the PP. In this chapter I argue that the bioproponents' responses are mirrored in the RCGM's findings. I then provide a brief summary of events since the RCGM, and provide recommendations for both the environmental groups and government for future public debates.

## 9.1 Deconstructing the Commissioners' Findings

The recommendations of the environmental groups and the bioproponents are based on contrasting perspectives and this is not totally overlooked by the Commissioners as they include some nominal discussion of worldviews in their findings. In the 25 (out of 1200) pages devoted to cultural, ethical and spiritual issues they state: '...[I]t is important to make these world views visible in the debate as they have an important place in shaping the choices made about ethical issues raised by genetic modification' (Royal Commission on Genetic Modification, 2001e, p.18). The Commissioners discuss Te ao Māori —the traditional Māori worldview, the ecological worldview, and the Judaeo-Christian worldview. They neglect to discuss the operational worldview of the RCGM, which I have argued is the discourse of modernity. Either

they could not see their own biases, or their worldview, as the dominant one in western society, was seen to be above scrutiny (Rogers-Hayden & Hindmarsh, 2002). Instead, the Commissioners looked only for shared values among the divergent worldviews. They state that: ‘... in the midst of such diversity, can a common core of values be found as a basis for ethical decision-making? The Commission debated that question and decided that such a common core of values exists’ (Royal Commission on Genetic Modification, 2001e, p.11).

The Commissioners argue that there are seven core-values all New Zealanders hold in common. These are:

- the uniqueness of Aotearoa New Zealand;
- the uniqueness of Aotearoa New Zealand’s cultural heritage;
- being part of a global family;
- the well-being of all;
- freedom of choice;
- participation; and
- sustainability.

### **9.1.1 The RCGM’s Sustainability Trope**

Concerning sustainability the Royal Commissioners note the following.

*The need to sustain our unique but fragile environment for generations to come was often passionately mentioned by many. Tangata whenua use the word kaitiakitanga (stewardship) to describe the same concept. Any estimate of benefits and costs must include sustainability as a central criterion. An environment that is cherished and cared for is not just a survival mechanism;*

*it is for many also a source of spiritual and cultural hope* (Royal Commission on Genetic Modification, 2001a, p. 12).

The Commissioners use the Judeo-Christian metaphor of ‘stewardship’ for management of the physical environment, reducing kaitiakitanga to this anthropocentric notion. In Māoridom humans are believed to be the youngest of all living things and are thus responsible for caring for their elders (Greensill, 1999; Mead, 1998). This is a view of taking care of the environment that is different from the Judeo-Christian belief that all life on earth is for human use (Rogers-Hayden & Hindmarsh, 2003, see also Hutchings, 2004).<sup>90</sup> It is noteworthy that sustainability is presented as a core value, not a prescriptive concept, and this definition does nothing to offer guidance on exactly what sustainable management would involve. This is not entirely missed by the Commissioners either as they rather ambiguously state that ‘... there are widespread differences of view on how to give effect to shared views . . . .’ (Royal Commission on Genetic Modification, 2001a, p.25).

In a discussion of the use of sustainability, Cahill (2002) identifies what he sees as the key to the increasing governmental use of the term.

*Sustainability is a ‘hurrah word’ in contemporary political debate—everyone is in favour of it just as we are all in favour of democracy or justice . . . [Governments have] taken to spraying the word all over many papers and reports . . . .* (p.1).

Sustainability like the other core-values is thus vague enough to be everything to everyone and it therefore offers no ‘direction’.

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<sup>90</sup> I am not meaning to imply that there is only one Māori way. Rather I wish to highlight how Māori approaches are informed by Māori cosmology, which contrasts with the approaches of Christianity. For example, see Tipene-Matua (2000) on how two Iwi (tribes) made contrasting recommendations to ERMA on the disposal of GE materials despite both being informed by a Māori world-view.

In collaborative work with Hindmarsh and Risely (Rogers-Hayden, Hindmarsh & Risely, 2002) we note that ‘core values’ have emerged in Australasian environmental management in recent years as a way of seeking compromise, representing a technocratic approach that does not overtly challenge the dominant worldview.

The above set of core values is essential to the RCGM’s proposed decision-making framework of a Bioethics Council. As the Commissioners state: ‘In the absence of an effective framework for ethical decision making, decisions about the use of biotechnology will be made by default. It is vital that the Bioethics Council provides continuing consultation and active choice, allowing developments in biotechnology to be based on the values we hold in common.’ (Royal Commission on Genetic Modification, 2001a, p.27). It is implied that without ‘an effective framework for ethical decision making’ decisions will likely be made according to the status quo. However, if values in common can be established then the council can develop GE according to these values. The apparent emphasis is that GE should be developed; it is just a matter of attaining a balance of values and ethics, by a ‘governing’ Bioethics Council (Rogers-Hayden & Hindmarsh, 2002). Therefore the RCGM, like the bioproponents, proposes developing GE while recommending sustainability.

### **9.1.2 The RCGM’s Precautionary Principle Trope**

The RCGM (2001a) also mirrors the bioproponents’ trope on the precautionary principle. The Commissioners reject the PP stating that:

*Although we heard much discussion of the precautionary principle and precautionary approach from those who opposed the release of genetically modified organisms into the environment, there was no consensus on the*

*meaning of either term. The meaning of precaution often rests in the values held by the speaker (p.67).*

The flexibility of the PP is presented by the Commissioners as its limitation. It has been suggested that the PP's fluidity means its reconstruction with every application. 'Given the epistemic novelty, the precautionary principle cannot simply be interpreted or applied. Rather, it is constructed anew: its content depends upon the types of uncertainty which are emphasised, investigated and managed' (Levidow, 2001, p.847).

In work with Hindmarsh (Rogers-Hayden & Hindmarsh, 2002) we state:

*Critics of the PP . . . complain [that] it represents the political restriction of scientific and societal progress, and is thus anti-science . . . A central issue of contention is that the PP would deny observable scientifically established cause and effect relationships, which lie at the heart of modern scientific methodology.*

The attractive possibility to advance from reactive modernist risk management practices to the proactive PP is therefore not taken up. Instead, the RCGM opt for the modernist notion of Progress that I have argued to be based on an exploitative relationship with the ecosystem. The RCGM echoes the sentiments of the bioproponents expressed in this passage, reprinted below in Table 9.1 from Chapter Six.

**Table 9.1: Comparative Texts of the New Zealand Life Science Network and the Royal Commission on Genetic Modification.**

<p>The New Zealand Life Sciences Network (2000) state that:</p> <p><i>The discoveries of fire; domestication of animals; the use of metals for implements; seafaring; electricity; motorised transport; flight all carried unknown risks. Today those same discoveries are part of our daily lives, we even depend on them for our daily existence and we choose to accept the risks associated with those beneficial activities. The discoveries of biotechnology are no less, or more, risky (p.23).</i></p>	<p>While the Commissioners (2001a) similarly conclude that:</p> <p><i>Technology is integral to the advancement of the world. Fire, the wheel, steam power, electricity, radio transmission, air and space travel, nuclear power, the microchip, DNA: the human race has ever been on the cusp of innovation. Currently, biotechnology is the new frontier. Continuation of research is critical to New Zealand's future. As in the past we should go forward with care (p.3).</i></p>
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This Progress is autonomous of values and culture. The benefits of GE are viewed as out-weighing the risks, and the scientific uncertainty surrounding it is dismissed as a lack of experience of a new technology. In summary, the Commissioners reject the opportunity to address what Beck (1992a) calls organised irresponsibility—the inadequacy of modernist risk management practices to cope with scientific uncertainty surrounding GE. Instead, they accept the bioproponents' co-opted version of sustainability and reject the opportunity to shift the burden of proof from environmental groups having evidence of harm onto developers demonstrating a lack of harm.

## 9.2 Post-RCGM

Since the release of the RCGM's report in July 2001 the government has initiated a further inquiry, into Corngate—the sweetcorn scandal that occurred during the RCGM referred to in Chapter One—and has been working through the recommendations of the Commission. Although, as mentioned, official inquiries have often been characterised as undertaken to subdue powerful pressure groups, and thus portray continued opposition to an issue as unreasonable, neither the release of the RCGM's findings nor the initiation of the Corngate inquiry have subdued the resistance against GE in Aotearoa New Zealand.

On 29 of October 2003 the government lifted the moratorium on GMO field releases as part of its biotechnology strategy. Along with this plan the government has created Toi te Taiao, the Bioethics Council (see Toi te Taiao: the Bioethic Council, 2004), and funded research into social, economic, ethical, environmental and agricultural issues related to GE. A further part of this is changing legislation to deal with GMO releases. The New Organisms and Other Matters Bill 2003 passed its third and final reading on 14 October 2003 (Fitzsimons, 2003a) after returning from a Parliamentary Select Committee (Hobbs, 2003). The Bill includes alterations to the Hazardous Substances and New Organisms Act to make legislative provision for 'conditional releases'<sup>91</sup> of GMOs and reviewing liability arrangements surrounding GMOs. The Education and Science Select Committee which considered the Bill and reported back to Parliament in September 2003, like the RCGM itself, has been criticised as

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<sup>91</sup>. A conditional release is the release of a GMO according to certain criteria established by ERMA. For example, this may include continued monitoring of the organism once it is released or that only sterile plants are released (Hobbs, 2003).

predetermining the outcome as they 'blatantly and deviously referred the Bill governing GMO releases to a select committee with no Green MPs' (Fitzsimons, 2003b).

As the government continues to work through the RCGM's recommendations, public opposition to GE also continues. Since the RCGM released its findings protests have included the uprooting of a GE potato trial at Lincoln University Crop and Food Research Institute Laboratory, the occupation of the offices of the ERMA by concerned Māori, and 3 500 'ordinary citizens' signing a pledge to take direct action against GE (Genus & Rogers-Hayden, *forthcoming*).

Thus, at the time of writing, the government is preparing for field releases, having lifted the moratorium on the 29 October 2003 and is proceeding with the New Organisms and Other Matters Bill. Furthermore, in January 2004, ERMA approved the field testing of GE onions in the South Island (GE-Free Canterbury, 2004). At the same time environmental groups throughout the country continue with their strategies, holding national inter-environmental group meetings (such as those held in July and December 2003) and continue planning their actions in response to GE developments and pledging their continued resistance.

### **9.3 Environmental Groups**

The discussion of the RCGM in this thesis completes the main purpose of the research—to identify some of the influences that led to the RCGM producing the findings they did. One of the sub-purposes of this thesis has been to more specifically

examine the environmental groups' involvement in order to assist them in their future dealings with inquiries. It is about these matters that I will now draw together some of my conclusions.

Pondering upon the RCGM's findings, the use of 'sustainability' and rejection of the PP may be disheartening to environmentalists as it reflects a shallow green interpretation of the GE debate by the Commissioners. However, the Commissioners' sentiments can also be seen as indicating that environmentalists had some influence on the RCGM. The bioproponents' attention to what have traditionally been environmental notions, such as their acceptance of the co-opted version of sustainability, can be expected—as this reflects the strength of the environmental groups' challenge to the established order (Rowell, 1996).

Buttel (1993) refers to such co-optation as the 'establishment appropriation of progressive symbols' (for a fuller discussion see Buttel & Gillespie, 1988). He suggests that sustainability is a type of agrarian protest movement, and just like the protest movements of the 1960/70s, sustainability has moved through the appropriation 'lifecycle'. The appropriation life-cycle consists of four stages. The first stage is when a symbol crystallises a challenge to the legitimacy of dominant institutions and their practices. If the symbol is sufficiently successful in mobilising supporters, the second stage is entered, and the symbol works to threaten the hegemony. The third stage occurs when these institutions respond to the challenge by 'appropriating' or embracing the symbol—typically demobilising the opposition. Finally, the groups that initially created the symbol are left with the dilemma of

whether to continue working at/with an established appropriated symbol or move on to other demands/symbols to maintain pressure on institutions.

Buttel's (1993) description of the life-cycle of 'sustainability' would appear to suggest that 'sustainability' is no longer capable of carrying the environmentalists' challenge. However Dryzek (1997) suggests otherwise, proposing that, despite the problems of its contested meaning, there is simply no better medium for environmentalists to use.

*Does this variety of meanings mean we should dismiss sustainable development as a mere slogan, an empty vessel that can be filled with whatever one likes? Not at all. For it is not unusual for important concepts to be contested politically. Think, for example, of the word democracy, which has at least as many meanings and definitions as does sustainable development (p.125).*

I suggest that sustainability, like the precautionary principle, defies having just one meaning. Instead as a trope it can be seen as a form of negotiated meaning through its applications. Therefore environmentalists' use of sustainability can be seen, not as merely using a symbol that was already appropriated but, as influencing the finding of the RCGM through its contestation.

Similarly, I endorse the environmental groups' use of the PP which, although rejected by the RCGM, provides a vehicle for the groups to further renegotiate 'science' and articulate sustainability into a principle. Because the PP is flexible it can be used even in contrasting ways in a variety of situations.

More specifically, evaluating the environmental groups' tactics is more than determining whether or not to continue battling with appropriated rhetoric. It also includes the broader question of how to negotiate arguments in second modernity. As

I have discussed, the use of rational scientific discourse can be very useful to environmental groups for gaining credibility. Such use of science by groups pushing society towards self reflection is seen by Beck (1992a) as necessary so that science can encounter itself. However, I have also noted that keeping within the modernist trope upholds dualistic assumptions, marginalising the values within the debate. The effect of this is that social decision-making masquerades as fact-finding. I suggest that environmental groups continue occupying the ‘paradoxical space’ by straddling the ‘rational-Romantic divide’. I believe that this entails situating critiques of environmental/technological developments within a framework of modernity to expose the social constructivist nature of the situation and in doing so expose the values underlying science and scientific decision-making.

It follows that environmental groups should continue to use science while strategically highlighting the social construction of environmental/technological developments. Similar advice is offered by Peter Wheale and Ruth McNally (1996) in their discussion ‘On How the People Can Become ‘the Prince’: Machiaevllian Advice to NGOs on GMOs’.<sup>92</sup>

*Our advice to NGOs is not to strive to be consistent—to eschew constancy—since consistency is an impediment not borne by our adversaries. Just as industry simultaneously argues in the legislative arena that genetically engineered organisms are merely part of a continuum, with ‘nature’, whilst in the patenting debate that they are ‘inventions’, so too should NGOs be flexible in their approaches, adopting, and subtly adapting, their arguments instrumentally to suit the purposes of the debate. Do not be bullied into consistency by your critics since this will hamper your endeavours. And remember the notion of a ‘grand narrative’ is untenable (p.183).*

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<sup>92</sup>. This ‘Machiavellian advice’ is advice in the form of a letter to NGOs on how they can create strategies to liberate the people from ‘authoritarian’ GE. Wheale and McNally (1996) describe this as advice in the style of the letter sent by ‘Nicolo Machiavelli to the Magnificent Lorenzo De’Medici’ (p.177).

I further suggest continuing use of a similar type of tactic that can be likened to the appropriation of environmentalism by bioproponents. Rather than appropriating GE terms and images environmentalists can deconstruct the images and words of their opposition and parody them. Such efforts are commonly called ‘detournement’.<sup>93</sup> Levidow (2000) describes such success in ‘Pollution Metaphors in the UK Biotechnology Controversy’. He notes how terms such as ‘frankenfood’ and ‘genetic pollution’ have gained currency in the public arena. *The Ecologist* parodied the Monsanto phrase ‘Food, Health, Hope’ by saying ‘At Nonsanto, opinion is something we buy . . . ‘Freud, Stealth, Hype’ (cited in Levidow, p.331).

Similarly, the environmental groups in Aotearoa New Zealand have experienced some success. They may not have been able to persuade the RCGM and the government that the future for Aotearoa New Zealand is an organic GE-free nation. However the environmental groups have been successful in mobilising the public against GE and this mobilisation continues. Such sentiments about the success of environmentalists despite the RCGM findings were expressed by Annette Cotter of Greenpeace New Zealand when during the RCGM she said ‘I think we’ve won the argument but I don’t think we’ve won the politics’ (Interview 2001).

## 9.4 Government

Deconstructing the discourse of the RCGM has enabled me to discern a number of issues that could be addressed to help make future inquiries more inclusive. However

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<sup>93</sup>. This type of creative resistance is encouraged on ‘Adbusters’ the website for ‘Culture Jammers’. See Adbuster (2003) for examples and information about this type of protest action.

the larger issue of the relationship between public inquiries and systems for social decision-making remains problematic.

An initial point that could be addressed is the appointment of Commissioners. For the RCGM the government 'hand picked' four Commissioners. Such processes have the potential for a government to select people who may be known to support the government's directives on the issue or at least select people who do not oppose the government's 'planned' direction.

In regards to the selection of Commissioners I believe that this case of the RCGM has highlighted the importance of selecting at least one member who has a thorough understanding of disputes of an environmental/technological nature and preferably a member who has an understanding of inclusive decision-making. Of particular importance is engaging Commissioners with a diversity of worldviews. This involves selecting people who have more than merely environmental expertise but people who are familiar with what is entailed in utilising an alternative worldview. The appointments should thus be made with an awareness that choosing people because of their skills in areas such as science and law, although useful for negotiating processes of society's administration, reproduces those value systems and corresponding power relations. I conclude that four Commissioners are unlikely to provide the skills base necessary for an inquiry and accordingly a larger group of people may be necessary. Bearing these points in mind when appointing Commissioners may help an inquiry move beyond legal-scientific rationale.

What I am describing is a mindfulness of alternatives to the dominant worldview, and such an awareness may have avoided the creation of some of the hurdles for participation within the processes of the RCGM. It follows that an open template with an accompanying list of issues the Commissioners would particularly like to receive submissions upon would allow for holistic arguments.

Similarly, the creation of more generous timelines, or at least the publication of timelines further in advance than those that occurred in the RCGM, would enable greater participation from voluntary groups. It would, for example, aid groups that operate on strong democratic lines that require time to consult members.

This more inclusive perspective requires a greater commitment from Commissions when it comes to viewing material inequity as related to political equity. The provision of assistance, such as financial assistance, in the RCGM for example, would have aided the environmental groups to be on a more 'equal footing' with the bioproponents. This would have helped public interest groups in their ability to provide submissions and to cross-examine others.

These suggestions, although addressing important barriers to participation in the RCGM that became apparent through this study, still leave the core issues of modernity largely untouched. One of the more radical postmodern challenges to inquiries is questioning the emphasis on 'expertise' which is inherent in Royal Commissions. Such divisions are built on the modernist assumption of a separation of 'facts' from 'opinions' and accordingly on the ideal of neutral (scientific) knowledge. As Wynne (2001) notes, although scholarship for over a decade has been debunking the notion of the public as dupes who turn against technologies because of their fear

of the unknown, this established body of work seems to have had little impact beyond academia. Schiappa (1989) proposes that the separation of spheres of argument, such as that among public /technical/ personal, stifles public debate. It is a radical critique, an epistemological challenge, and also a challenge to knowledge/power relations to suggest that '[t]o create 'true public space'—to maximise collective power/knowledge relations—critics must discount and de-construct the philosophical framework perpetuated by the notion of distinct 'spheres of argument' (p.49). In effect he is writing about reflexivity—an acknowledgement that all positions on GE are value positions.

Finally, this brings me to question the main assumption underlying participation in inquiries—that liberal democratic governments, such as that of Aotearoa New Zealand, wish to have inclusive public debate as a system of social decision-making. The government's handling of the New Organisms and Other Matters Bill 2003 labours this point through the exclusion of environmentalist input into the Parliamentary Select Committee. The government was not inclusive of environmental concerns in the RCGM, evident especially in its selection of Commissioners, nor in its consideration of the implementation of the RCGM's findings.

The practice of the RCGM and similar Commissions raises an important issue. As the RCGM was established along the lines of legal-scientific rationality which marginalised non-dominant perspectives, why elicit public input? A cynical view of the RCGM could mean seeing the RCGM as, in keeping with previously noted criticisms of formal governmental inquiries, involved in attempting to disempower public opposition through creating the illusion of a public participation. This chapter

concludes my argument on the RCGM. A summary of the complete argument is provided in the following chapter.

# 10

## CONCLUSIONS:

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In the previous chapter I concluded my analysis of the RCGM, and argued that the Commissioners' findings mirrored the bioproponents' discourse. In this chapter I will summarise my thesis, linking this back to the aim and objectives I set out in the introduction. I will then reflect upon the approach I have used for this research, before discussing some possible directions for further related research.

The **aim** of this thesis was: to deconstruct the 'discourse' of the Royal Commission on Genetic Modification in order to analyse what affect this had on its findings. Sir Thomas Eichelbaum, the Chair of the Royal Commission on Genetic Modification, when discussing the Commission, shared his vision for the consultation process: 'We want all New Zealanders to engage in the genetic modification debate and share their views on the issues, so it's essential we develop the right processes to ensure we're able to achieve that goal' (Royal Commission on Genetic Modification, 2000d). From my analysis of the 'discourse' of the Royal Commission on Genetic Modification the conclusions I have reached about the RCGM are in considerable contrast with Eichelbaum's aim. My multidimensional deconstruction of the RCGM found, that rather than inviting participation, the processes marginalised dissent ultimately predetermining the RCGM in favour of GE.

## 10.1 Deconstructing the Discourse of the RCGM

I deconstructed the RCGM to fulfill three objectives. These **objectives** were firstly, to analyse the social and historical context of the RCGM and the affect of this on the RCGM's discursive field. The second objective was to analyse the discursive field of the RCGM and the effect of this on the tropes and the RCGM report; and the final objective was to analyse the text of the RCGM discourse and the effect of this on the findings of the RCGM.

Firstly, to analyse the social and historical context of the RCGM and the effect of this on the RCGM's discursive field, I applied a Faircloughian multidimensional discourse model to the RCGM and contend that it was embedded in, and reproduced, modernist rationality. I argued that modernity formed the social and historical context, the first element of the discourse model, of the RCGM. 'Rationality', reductionist science and law are based on the Enlightenment dualism of culture—nature, which appears given and 'natural'.

Secondly, to analyse the discursive field of the RCGM and the effect of this on the tropes that emerge and the RCGM report, I have argued that the hegemony of modernity influenced the processes of the RCGM. The RCGM may have been a rare formal point of contact between the publics, pressure groups, industry and government but the reflexive opportunity to respond to the knowledges of the publics was lost as the inquiry became established along the lines of the Commissions of Inquiry Act of 1908. The publics were separated from those with 'expertise' (Interested Persons) and the

objections to GE (92% of submissions) were dismissed. Instead the Commission attempted to turn this political struggle into a rational scientific administrative discourse. The processes of the RCGM can be seen as framing the issue on hand to be one more of technical discovery than of social decision-making. The modernist ideals that saw interest groups separated from publics—presumably separating ‘facts’ from ‘opinions’—continued through the processes of the RCGM. The environmental groups were disadvantaged by the reductionist methodology of the Commission. Restrictive timelines presumed hierarchical organisational structures, limiting member consultation time and creating additional obstacles to participation for groups relying on mainly volunteer labour and small budgets.

The Commission also restricted the environmental groups’ ability to object to GE as they provided a reductionist template which was based on the presumption that groups could present their arguments in stand alone answers. Environment groups were unable to present holistic arguments. Furthermore, the cross-examination process, which is more suitable for finding technical details than it is for social decision-making, resulted in the bioproponents providing a Queens Council to cross-examine the environmental groups while the environmental groups were unable to afford lawyers (or staff) to read all the submissions, attend all the hearing and provide cross-examination of all the bioproponents. This process was based on a reductionist perspective, in which elements can be viewed in isolation from one another, so the Commissioners viewed material inequity as separate from political equity.

Finally, to analyse the text of the RCGM discourse, and the effect of this on the findings of the RCGM, I have drawn on theories of boundary work. My analysis reveals that the discourse that developed through the dispute over boundaries of terms, between the environmentalists and the bioproponents, can be seen as framing the findings of the RCGM. In the final report the Commissioners recommend proceeding with GE with care, through sustaining Progress and rejecting the precautionary principle.

The bioproponents suggest that science is neutral, leading to Progress, and that decision-making on GE should therefore be carried out by scientists. The environmental groups use 'sustainability' to challenge the bioproponents' hegemonic notions. They propose a sustainable, organic, GE-free society instead of Progress and propose implementing the precautionary principle which disputes the need for scientific evidence of cause and effect before taking preventative action. The bioproponents can then be seen as co-opting sustainability to mean GE, and rejecting the PP as being too variable in favour of 'caution'.

## **10.2 Research Approach**

This study of the RCGM was created through the application of my interdisciplinary perspective. I have been able to examine the negotiation of meaning between the commissioners, the environmental groups and the bioproponents to gain an insight into the influences, both of the historical knowledge structures and of the submissions, on

the Commissioners' findings. When I began my research into the RCGM, as mentioned previously, I did so because I was concerned about the prominence of science in the Commission. I have found my interdisciplinary perspective has developed along with my interest in the Commission to illuminate what I now see as the core issues of the RCGM—the restricting influence of modernity.

In my research process I found Fairclough's work invited me to ask myself a number of questions about what made up the discourse of the RCGM and what the influences on it, and on the production and consumption of the related texts, were. The impact of this line of inquiry is evident in the presentation of this thesis in a tailored Faircloughian model. I found the three dimensions too restrictive to be applied literally. However, unlike Fairclough, in his more recent work, I still found utility in referring to its three dimensions and just developed it to accommodate the complex RCGM by combining the historical context and discursive field into one element.

Another key aspect of my method is boundary work. This helped me conceptualise the bioproponents and the environmental groups as not merely two sides fighting about GE in their submissions that were considered by the RCGM, but rather as groups creating the boundaries of the issues through their engagement in the issue rather than just responding to the debate. Science was therefore not just used or not used, but given form in this forum.

The discourses that were created are thus not static clashes of ideals but time and space specific encounters. (Human) geography has provided an interdisciplinary home for

this focus on the relationship between people and the environment traced through language. In its postmodern form (human) geography has also informed my scepticism towards the privileged epistemology of science and thus underpinned my critique of Enlightenment thought.

This critique of Enlightenment legacies has therefore been central to my research, and Beck's conceptualisation of Modernity and risk has been vital to placing the RCGM in a historical context and analysing the role of modernity in restricting input into the Commission. His research has also been fundamental to my understanding of GE as a risk of second modernity and the self-reflection needed within science itself to overcome the Public Understanding of Science model. Science and technology studies have advanced this research further challenging the 'deficit model' and elucidating how all knowledges are socially situated.

Finally, ecofeminism's attention to Enlightenment dualisms has been fundamental to my insights into patriarchy's domination over nature, and women, being socially constructed through language and how the Commissioner's processes marginalised environmental input through the reductionist template.

In conclusion this personal combination of approaches has enabled me to draw out some of the influences on how the Commissioners came to their findings and in illuminating how, through reproducing Enlightenment legacies, the Commissioners failed to see the transformative potential presented by the Environmentalists and so created 'organised irresponsibility' through reproducing modernity.

### 10.3 Areas for Further Research

As stated, the findings of the RCGM were a letdown to many environmentalists, and many expressed frustration over the RCGM's processes. It led many of the environmentalists who were involved in the Commission to question if their involvement had been a waste of resources and whether they would participate in any further inquiries.

A number of interviewees expressed not only frustration with the RCGM but also with ERMA's public submission process. As Mary-Ann Howard-Clark (Interview, 2001) said '... it's almost like talking to a brick wall ...' Interviewees expressed fatigue and stated that they had 'given-up' on ERMA as an avenue for challenging the use of GE. They pinpointed the emphasis on science as the limiting factor to environmentalist involvement. Susie Lees' (Interview, 2001) comment sums up a number of the interviewees' sentiments when she states that:

*... the biggest problem is it doesn't matter how knowledgeable you are, if you're not an actual scientist, you're always looked at as an uneducated member of the population . . . [like] 'what are you doing involving yourself in something you have no knowledge about?'*

It appears, both from the literature and from the interviews, that the RCGM is not unique as a process that invited public input yet marginalised it. I believe that further research is essential for exploring the way marginalisation of the publics may limit the ability of society to evaluate options beyond those hegemonically assumed as 'natural Progress'. This is particularly important for controversies such as GE in which such input may help create pro-active management systems. Comparative work could be

very useful for this. For example, comparing the processes of the RCGM with those of ERMA may offer useful insights. Research is currently being undertaken, at the University of Waikato by Jeanette Wright, into the processes of an ERMA hearing about a GE application. A comparison of these processes—between a Royal Commission and a governmental body’s hearing processes—may help increase understanding into the pre-policy public debate on GE in Aotearoa New Zealand. It may also provide a forum for comparison of public debates, between the RCGM where those with ‘expertise’ were separated from the publics and ERMA’s hearings where they are not. In this regard I believe further research is needed on the logistics of having a debate in which such demarcations do not take place. I am particularly interested in whether such debates become dominated by the ‘stakeholders’—once again marginalising the publics. Moreover, such research could examine the degree to which public inputs (such as non-scientific discourses) are accepted as equally valid as ‘expertise’ (such as scientific input).

In this regard an interesting comparison to the RCGM would be the ‘GM Nation?’ public debate, which was undertaken in the United Kingdom in 2003 (see GM Nation? Steering Board, 2003).<sup>94</sup> I would be interested in the extent to which the public debate will influence policy in Britain in the light of the policy developments from the RCGM. This is part of a larger issue deserving of attention, which is the extent to which policy is affected by these government initiated public debates.

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<sup>94</sup>. GM Nation? was a public debate that comprised of two elements, ‘grassroots debates in local communities’ and a ‘research component’ involving public discussion groups. GM Nation? was launched on 3 June 2003 with the Steering board’s report published on 24 September 2003. An independent evaluation of the debate has been undertaken at the Centre for Environmental Risk University of East Anglia, supported by the Leverhulme Trust.

The GM Nation? debate could also provide a comparison with regards to the possible influence the backgrounds of those organising the debate may have on the processes. It was organised by a steering board which comprised people from a wide variety of backgrounds including environmentalists and academics such as Robin Grove-White, whom I have referred to in this thesis (see GM Nation? Steering Board, 2003). Research into whether or not this prevents the submission processes from being restricted to a legal-scientific rationality may yield fascinating results.

These areas of research revolve around providing insights into the marginalisation of alternative worldviews in modernist systems. They lead to the possibility of more specific research into what negotiating worldviews in a liberal democracy exposes. Stanley Fish (1994) argues that liberal society is ‘informed by faith (a word deliberately chosen) in reason as a faculty that operated independently of a particular worldview’ (p.134). It follows, he suggests, that the society is committed to the equal hearing of all worldviews—as long as they meet the criteria of ‘reason’. As soon as ‘the primacy of reason’ is displaced, reason is shown to be nothing more than a competing ideology rather than a procedure, liberal society (ideology free society) no longer exists. Turner (2001) similarly concludes that this means that ‘liberal regimes are no less ideological than other regimes; rather, the basis of liberal regimes in ideological authority is concealed under a layer of doctrinal self-deception’ (p.127). These points raise a question about what it means for a liberal democracy to be confronted with its hidden values. Investigating such a question would in effect mean an empirical study related to Beck’s (1992a) thesis, which he is often critiqued for failing to provide, that Risk Society is not optional but a progression.

Such a development relies on reflecting upon how values permeate rationality. Although science and technology studies have been at the forefront of highlighting this, these insights have yet to be significantly taken up beyond academia. However, one field that is showing promise is the traditionally scientised field of planning. It is undergoing reflection on the breakdown of traditional rationality for decision-making. Ernest Alexander (1984) suggests that planners have been deconstructing rationality since the 1950s and although alternatives have not yet gained prominence planners are attempting to create alternatives for decision-making.

Knowledge about creating more inclusive decision-making processes may be aided by studying the relationship between the critique of rationality and the creation of more inclusive decision-making processes in planning. This may help with the development of the thesis that reflexivity leads to increased public participation that will aid policymaking. It may also provide insights into how such reflection can be encouraged so that inquiries, such as the Royal Commission on Genetic Modification, can be public debates rather than processes of marginalisation—processes that led it to be called, by one critic, ‘the Royal Omission’ (see Campbell, 2003).

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## TABLE OF APPENDICES

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Appendix 1:	Publications of Thesis Material
Appendix 2:	Submissions and witness briefs
Appendix 3:	Research Consent Form - researcher's copy
Appendix 4:	Research Consent Form – participant's copy
Appendix 5:	Interested Persons Submission Template
Appendix 6:	The Recommendations of the RCGM

## Appendix 1: Publications of Thesis Material

### Book chapters

Genus, A. & Rogers-Hayden, T. (*forthcoming*). Genetic Engineering in Aotearoa New Zealand: Opening up or Closing Down Debate? In M. Leach and I. Scoones (Eds.), *Science, Citizenship and Globalisation*. Book for DRC Series with Zed Press.

### Journal articles

Rogers-Hayden, T., Hindmarsh, R. & Risely, M. (2002). 'Precaution' Downunder?: Marginalising the Strong Precautionary Principle in GE Debates in New Zealand and Australia, *Ecopolitics Thought+Action*, 1(4): 86-97.

Rogers-Hayden, T. & Hindmarsh, R. (2002). 'Modernity Contextualises New Zealand's Royal Commission on Genetic Modification: A Discourse Analysis'. *Journal of New Zealand Studies*, 1(1):41-61.

Rogers-Hayden, T. and Campbell, J. R. (2003). 'Moving Beyond Science? Environmentalists' Submissions to New Zealand's Royal Commission on Genetic Modification'. *Environmental Values*. 12(4) 515-534.

### Conference papers

Jones, M. & Rogers-Hayden, T Public Engagement in Biotechnology Governance: Reproducing the Preoccupations of Modernity. Lancaster-Cardiff, Centre for Economic and Social Aspects of Genomics (CESAGen), First International Conference: Genomics and Society. The Royal Society, London, UK 2-3 March 2004.

Hindmarsh, R. & Rogers-Hayden, T. Inquiries as Sites of GM Governance in Australia and New Zealand: Attempts to Construct 'Trust' Heighten 'Mistrust'. The National Centre for Research on Europe and the Science Technology Studies Network: Technologies, Publics and Power. Akaroa, New Zealand 1-5 February 2004.

Rogers-Hayden, T. & Hindmarsh, R. Sustaining Progress or Progressing Sustainability? *Reading* the Report of Aotearoa New Zealand's Royal Commission on Genetic Modification. The Ecopolitics Association of Australasia XIV: Greening Sustainability. RMIT Melbourne, Australia 27– 30 November 2003.

Genus, A. & Rogers-Hayden, T. The Analysis of Technological Risks and Uncertainties: a Framework and the Case of Genetic Engineering in Aotearoa New Zealand Science and Citizenship in a Global Context: Challenges from New Technologies. Institute of Development Studies, University of Sussex, Brighton, England, 12-13 December 2002.

Rogers-Hayden, T. Progressing Aotearoa New Zealand's' Royal Commission on Genetic Modification. Progressing Sustainability or Sustaining Progress? European Association for the Study of Science and Technology: Responsibility under Uncertainty. University of York, England 31 July- 3 Aug. 2002.

Rogers-Hayden, T., Hindmarsh, R., & Risely, M. 'Engineering' Precaution Down Under: The Promises of the Precautionary Principle and its Eventualities in New Zealand's' Royal Commission on Genetic Modification and Australia's Gene Technology Act'. The Social World in the Twenty First Century: XV<sup>th</sup> World Congress of Sociology: Ambivalent Legacies and Rising Challenges. Brisbane, Australia 7-13 July 2002.

Rogers-Hayden, T. & Campbell, J. R. New Zealand's Royal Commission on Genetic Modification: Science for the Environment? Environment, Culture and Community Conference. University of Queensland, Brisbane, Australia 2-5 July 2002.

Rogers-Hayden, T. and Hindmarsh, R. 2001. 'New Zealand's Royal Commission on Genetic Modification as a Conduit of Power/Knowledge to Empower Genetic Engineering'. In S. Kerr, T. Buhrs and C. Dann (Eds.) *Green Governance: From Periphery to Power*. Ecopolitics Association XIII Conference Proceedings, University of Canterbury, Christchurch, New Zealand 29 Nov. –2 Dec. 2001.

Rogers-Hayden, T. Managing Risks Surrounding Genetically Engineered Food in New Zealand. Association of Social Anthropologists of Aotearoa/New Zealand 25<sup>th</sup> Annual Conference: Anthropology in Times of Risk. Hamilton, New Zealand 2-3 September 2000.

Rogers-Hayden, T. Is Genetic Engineering a Biotech(revolution)? Soil and Health Association of New Zealand national conference in association with Unitec. Auckland, New Zealand 19-20 May 2000.

#### Other publications

Rogers-Hayden, T. 'Submission to The Royal Commission on Genetic Modification on Behalf of the Safe Food Campaign'.

[http://www.gmcommission.govt.nz/publications/PDF\\_submission.html#IP](http://www.gmcommission.govt.nz/publications/PDF_submission.html#IP)

Dec. 2001.

## **Appendix 2: Submissions and Witness Briefs**

### **BIOPROPONENTS**

	Total pages
<b>Aventis CropScience Pty Ltd</b>	
Sub IP 0014	29
WB IP 0014 - A Glynn	5
WB IP 0014 - N Stevens	22
WB IP 0014 - R MacDonald	25
<b>DuPont New Zealand</b>	
SUB IP 0001	8
WB IP 0001- Cl Holland	9
WB IP 0001- F Sumich	12
WB IP 00 01- L Hyde	10
<b>MonsantoNew Zealand</b>	
Sub IP0006	44
WB IP0006- M Willocks.	
<b>New Zealand Life Sciences Network Inc</b>	
Sub IP 0024	76
WB IP 0024- Asst Prof C. Neal Stewart Jr.	23
WB IP 0024- Dr Adolf Stroombergen	35
WB IP 0024- Dr Gary Comstock	17
WB IP 0024- Dr Patrick Moore	
WB IP 0024- Dr Steven Hughes	12

### **ENVIRONMENTAL GROUPS**

	Total pages
<b>Environment and Conservation Organisations of New Zealand Inc</b>	
SUB IP 0102	050
WB IP 0102- C Holdredge	021
WB IP 0102- Prof T Traavik	029
<b>Friends of the Earth (New Zealand) Ltd</b>	
SUB IP 0078	45
WB IP 0078- Assoc Prof. P.R Wills	13
Evidence -Dr P R Wills	33
WB IP 0078- D Trussell	27
WB IP 0078- Dr A Pusztai	5
WB IP 0078- Dr S Bardocz	8
WB IP 0078- Dr S Ewen	5
WB IP 0078- S Reeves	19
<b>GE Free New Zealand (RAGE) in Food &amp; Environment Inc</b>	
SUB IP0063	55
WB IP 0063- J Carapiet	18
WB IP 0063- Mae Wan Ho	21
WB IP 0063- Prof J.E.Cummins	11
WB IP 0063- S M Druker	14

WB IP 0024- Julian Morri	26	<b>Green Party of Aotearoa/ New Zealand</b>	
WB IP 0024- Paora Ammunson & Tamati Cairns	29	SUB IP 0083	76
WB IP 0024- Professor Klaus Ammann	48	WB IP 0083- Dr E A Clark	19
WB IP 0024- Professor Martina McGloughlin	20	WB IP 0083- Dr E R Ingham	12
		WB IP 0083- Dr M Antoniou	14
		WB IP 0083- Dr S Eastham	7
		WB IP 0083- Assoc Prof P R Wills	*
		Evidence- Assoc Prof P R Wills	*
		WB IP 0083- Prof P R Regal	19
		<b>Greenpeace New Zealand Inc</b>	
		SUB IP 0082	87
		WB IP 0082- Assoc Prof P Wills	*
		Evidence- Assoc Prof P R Wills	*
		WB IP 0082- A Mittal	19
		WB IP 0082- B Cristison	13
		WB IP 0082- Prof J King	10
		WB IP 0082- Prof T Traavik	*
		WB IP 0082- Prof D Stabinsky	72
		<b>Nelson GE Free Awareness Group</b>	
		SUB IP 0100	51
		WB IP 0100- A A Saipe	9
		WB IP 0100- J Rifici	7
		WB IP 0100- R Dallas	2
		WB IP 0100- S Morgan	11
		WB IP 0100- S Druker	*

\* These witness briefs were also presented by another group. These were only counted once.

**Total all pages 1252**

## Appendix 3: Research Consent Form - Researcher's Copy

### RESEARCH CONSENT FORM Researcher's copy

#### Genetically Engineered Food in New Zealand

Tee Rogers-Hayden, (tr5@waikato.ac.nz)  
Dept. of Geography, University of Waikato, Private Bag 3105, Hamilton.

*Please return this copy*

I \_\_\_\_\_ of (contact details)

consent to participate in the doctoral research 'A Taste of Things to Come?: Deconstructing the Royal Commission on Genetic Modification'.

I understand that my participation will include the following activities and rights:

- I understand that I can withdraw from this study at any time;
- information gathered from me will be used for a Doctoral thesis in Social Science, and related research and publications;
- my interview(s) (in person or via telephone) will be recorded on paper (field notes) or audio tape;
- all identifying information about myself, including interview tapes and transcripts, will be kept in a secure locked location;
- I understand that (*please delete a or b*)
  - (a) my name, and other identifying information about myself **can be included in this thesis**
  - Or*
  - (b) my name, and other identifying information about myself **cannot be included in this thesis**, so a pseudonym will be used as a replacement.

-----  
Signature

-----  
Date

*If you have any queries regarding this research please contact me at the above e-mail address or phone wk 07 838 4466 ext. 6338, hm \*<sup>95</sup>.or mb \*. Alternatively, if you have a concern you may contact my chief supervisor Dr. John Campbell, ph 07 838 4466 ext. 8089, e-mail: jrc@waikato.ac.nz*

\_\_\_\_\_  
<sup>95</sup>. I have deleted my home and mobile phone numbers from this copy for privacy.

## Appendix 4: Research Consent Form – Participant’s Copy

### RESEARCH CONSENT FORM

#### Participant’s copy

#### Genetically Engineered Food in New Zealand

Tee Rogers-Hayden, (tr5@waikato.ac.nz)  
Dept. of Geography, University of Waikato, Private Bag 3105, Hamilton.

*Please retain this copy*

I \_\_\_\_\_ of (contact details)

consent to participate in the doctoral research ‘A Taste of Things to Come?: Deconstructing the Royal Commission on Genetic Modification’.

I understand that my participation will include the following activities and rights:

- I understand that I can withdraw from this study at any time;
- information gathered from me will be used for a Doctoral thesis in Social Science, and related research and publications;
- my interview(s) (in person or via telephone) will be recorded on paper (field notes) or audio tape;
- all identifying information about myself, including interview tapes and transcripts, will be kept in a secure locked location;
- I understand that *(please delete a or b)*
  - (a) my name, and other identifying information about myself **can be included in this thesis**
  - Or*
  - (b) my name, and other identifying information about myself **cannot be included in this thesis**, so a pseudonym will be used as a replacement.

-----  
Signature

-----  
Date

*If you have any queries regarding this research please contact me at the above e-mail address or phone wk 07 838 4466 ext. 6338, hm \* or mb \*. Alternatively, if you have a concern you may contact my chief supervisor Dr. John Campbell, ph 07 838 4466 ext. 8089, e-mail: jrc@waikato.ac.nz*

## Appendix 5: Interested Persons Submission Template

Submission (“Interested Person”)

Form 1

Royal Commission on Genetic Modification

### 1. Contact Information (Not for Publication)

#### Name and Address of Submitter

*This should be the name of the organisation accorded “interested person” status*

<b>Name</b>	Response
<b>Postal Address</b>	Response
<b>Courier Address</b>	Response
<b>Phone</b>	Response
<b>Fax</b>	Response
<b>Email</b>	Response

#### Address for Service in New Zealand (if different from above)

<b>Postal Address</b>	Response
<b>Courier Address</b>	Response

#### Contact Person for the Submission (if different from the name of the submitter)

*This person should have sufficient knowledge of the submission to be able and available to respond to queries from the Commission*

*This may be the name of Counsel representing the “interested person”*

<b>Name</b>	Response
<b>Position</b>	Response
<b>Postal Address</b>	Response
<b>Courier Address</b>	Response
<b>Phone</b>	Response
<b>Fax</b>	Response
<b>Email</b>	Response

## 2. Confidential Information (Not for Publication)

### Confidential Information

Please indicate whether or not your submission contains any confidential information

Yes / No

Please provide an explanation for any sections of the submission that you wish to remain confidential to the Commission

**These sections should be removed from the body of the submission and provided as a separate document marked CONFIDENTIAL**

*Confidential information should follow the same format as the submission*

*Clear reference to the existence of confidential information should be included in the body of the submission*

Response

## 3. Submission Description (Not for Publication)

### Submission Description

Please provide a *descriptive title* for the submission of no more than 255 characters (including spaces)

*The statement will be used as a long title in the Commission's information management system*

Response

**(For Publication)**

## 4. Name of Organisation/Person accorded "Interested Person" Status

Response

## 5. Submission Executive Summary

### Executive Summary

Provide an overarching summary of your submission and recommendations made [in respect of items (1) and (2) of the Warrant]. The Executive Summary should be no more than **3** pages in length

*Please note that individual section summaries will be required and therefore the Executive Summary should focus on summarising the issues addressed in the submission and provide cross references to the sections in which the issues are covered rather than summarising the substantive content*

Response

## 6. Witness Briefs Attached

### Witness Briefs

Provide a numbered list of the names and positions of witnesses from whom briefs are attached, including an indication as to whether or not you intend to present the witness at the formal hearings

*Witness briefs must be provided to the Commission with your submission*

*Witness briefs should be prepared on Form 2*

Response

## 7. Submission by Section (as specified in the matters set out in the Warrant)

### Submission by Section

Submissions are to be structured in line with the matters specified in the Warrant and the sections numbered accordingly

Each section should stand alone, and include a Section Summary, identifying the issues addressed in the section

**Submissions may address all or only some of the sections (as specified in the Warrant).** However section numbers should be retained, for example, if a submission addresses matters (a), (c) and (e), the sections shall be numbered (a), (c), and (e), rather than a, b, and c

Submissions may, within each section, adopt a sub-section approach using different headings; however, each paragraph should be consecutively numbered

### Section A Recommendations

The Warrant has set the Commission the task of receiving representations upon, inquiring into, investigating, and reporting on the items set out in Section A (1) and (2) below

#### Section A (1)

**A (1)** the strategic options available to enable New Zealand to address, now and in the future, genetic modification, genetically modified organisms, and products

#### Section A (1) Summary

Response

#### A (1)

Response

#### Section A (2)

**A (2)** any changes considered desirable to the current legislative, regulatory, policy, or institutional arrangements for addressing, in New Zealand, genetic modification, genetically modified organisms, and products

#### Section A (2) Summary

Response

#### A (2)

Response

### Section B Relevant Matters

The Warrant has set the Commission the task of receiving representations upon, inquiring into, and investigating, the matters set out in Section B (a) – (n) below

#### Section B (a)

**B (a)** where, how, and for what purpose genetic modification, genetically modified organisms, and products are being used in New Zealand at present

#### Section B (a) Summary

Response

#### B (a)

**Response****Section B (b)**

**B (b)** the evidence (including the scientific evidence), and the level of uncertainty, about the present and possible future use, in New Zealand, of genetic modification, genetically modified organisms, and products

**Section B (b) Summary****Response****B (b)****Response****Section B (c)**

**B (c)** the risks of, and the benefits to be derived from, the use or avoidance of genetic modification, genetically modified organisms, and products in New Zealand, including:

- (i) the groups of persons who are likely to be advantaged by each of those benefits
- (ii) the groups of persons who are likely to be disadvantaged by each of those risks

**Section B (c) Summary****Response****B (c)(i)****Response****B (c)(ii)****Response****Section B (d)**

**B (d)** the international legal obligations of New Zealand in relation to genetic modification, genetically modified organisms, and products

**Section B (d) Summary****Response****B (d)****Response****Section B (e)**

**B (e)** the liability issues involved, or likely to be involved, now or in the future, in relation to the use, in New Zealand, of genetic modification, genetically modified organisms, and products

**Section B (e) Summary****Response****B (e)****Response****Section B (f)**

**B (f)** the intellectual property issues involved, or likely to be involved, now or in the future, in relation to the use in New Zealand of genetic modification, genetically modified organisms, and

products

### Section B (f) Summary

Response

**B (f)**

Response

### Section B (g)

**B (g)** the Crown's responsibilities under the Treaty of Waitangi in relation to genetic modification, genetically modified organisms, and products

### Section B (g) Summary

Response

**B (g)**

Response

### Section B (h)

**B (h)** the global developments and issues that may influence the manner in which New Zealand may use, or limit the use of, genetic modification, genetically modified organisms, and products

### Section B (h) Summary

Response

**B (h)**

Response

### Section B (i)

**B (i)** the opportunities that may be open to New Zealand from the use or avoidance of genetic modification, genetically modified organisms, and products

### Section B (i) Summary

Response

**B (i)**

Response

### Section B (j)

**B (j)** the main areas of public interest in genetic modification, genetically modified organisms, and products, including those related to:

- (i) human health (including biomedical, food safety, and consumer choice)
- (ii) environmental matters (including biodiversity, biosecurity issues, and the health of ecosystems)
- (iii) economic matters (including research and innovation, business development, primary production, and exports)
- (iv) cultural and ethical concerns

### Section B (j) Summary

Response

**B (j)(i)**

Response

**B (j)(ii)**

Response

**B (j)(iii)**

Response

**B (j)(iv)**

Response

**Section B (k)**

**B (k)** the key strategic issues drawing on ethical, cultural, environmental, social, and economic risks and benefits arising from the use of genetic modification, genetically modified organisms, and products

**Section B (k) Summary**

Response

**B (k)**

Response

**Section B (l)**

**B (l)** the international implications, in relation to both New Zealand's binding international obligations and New Zealand's foreign and trade policy, of any measures that New Zealand might take with regard to genetic modification, genetically modified organisms, and products, including the costs and risks associated with particular options

**Section B (l) Summary**

Response

**B (l)**

Response

**Section B (m)**

**B (m)** the range of strategic outcomes for the future application or avoidance of genetic modification, genetically modified organisms, and products in New Zealand

**Section B (m) Summary**

Response

**B (m)**

Response

**Section B (n)**

**B (n)** whether the statutory and regulatory processes controlling genetic modification, genetically modified organisms, and products in New Zealand are adequate to address the strategic outcomes that, in your opinion, are desirable, and whether any legislative, regulatory, policy, or other changes are needed to enable New Zealand to achieve these outcomes

**Section B (n) Summary**

**Response**

**B (n)**

**Response**

## **Appendix 6: The Recommendations of the RCGM**

### **RCGM Recommendations**

The following is a consolidated list of all the recommendations made by the Commissioners, noting the chapters in which they appear (Royal Commission on Genetic Modification, 2001a, p.351-360).

#### **Chapter 6: Research**

##### *Recommendation 6.1*

that applications to develop genetically modified organisms in PC1 and PC2 containment be assessed by the Institutional Biological Safety Committees (IBSCs) on a project rather than organism basis.

##### *Recommendation 6.2*

that all approval forms, standards and regulations relating to the development of genetically modified organisms in containment be reviewed and updated.

##### *Recommendation 6.3*

that a separate, simplified form be developed for low-risk (Categories A and B) applications to IBSCs.

##### *Recommendation 6.4*

that the Hazardous Substances and New Organisms Act 1996 (HSNO) be amended to allow for the efficient importation of low-risk genetically modified organisms, through delegation of the approval process to the IBSCs.

*Recommendation 6.5*

that approvals to develop or import genetically modified organisms be deemed to cover their holding and breeding.

*Recommendation 6.6*

that HSNO be amended to clarify that research involving genetic modification of human cell lines or tissue cultures is covered by the Act.

*Recommendation 6.7*

that approval for development of genetically modified animal cell lines be delegated to the IBSCs.

*Recommendation 6.8*

that HSNO be amended to provide for a further level of approval called conditional release.

*Recommendation 6.9*

that HSNO be amended to cover procedures used in mammalian cloning, such as nuclear transfer or cell fusion.

*Recommendation 6.10*

that IBSCs include at least one Maori member, appointed on the nomination of the hapu or iwi with manawhenua in the locality affected by an application.

*Recommendation 6.11*

that the funders of research portfolios be resourced to include the costs of compliance with HSNO.

*Recommendation 6.12*

that the Environmental Risk Management Authority (ERMA) require research on environmental impacts on soil and ecosystems before release of genetically modified crops is approved.

*Recommendation 6.13*

that public research funding be allocated to ensure organic and other sustainable agricultural systems are adequately supported.

*Recommendation 6.14*

that public research funding portfolios be resourced to include research on the socio-economic and ethical impacts of the release of genetically modified organisms.

**Chapter 7: Crops and other field uses***Recommendation 7.1*

that, prior to the release of any Bt-modified crops, the appropriate agencies develop a strategy for the use of the Bt toxin in sprays and genetically modified plants, taking into account:

- the concept of refugia
- limitations on total planted area
- home gardener use.

*Recommendation 7.2*

that the appropriate agencies develop a labelling regime to identify genetically modified seed, nursery stock and propagative material at point of sale.

*Recommendation 7.3*

that the Ministry of Agriculture and Forestry (MAF) develop a strategy to allow continued production of genetic modification-free honey and other bee products, and to avoid cross-pollination by bees between genetically modified and modification-free crops, that takes into account both geographical factors (in terms of crop separation strategies) and differences in crop flowering times.

*Recommendation 7.4*

that, in connection with any proposal to develop genetically modified forest trees, an ecological assessment be required to determine the effects of the modification on the soil and environmental ecology, including effects on soil microorganisms, weediness, insect and animal life, and biodiversity.

*Recommendation 7.5*

that, wherever possible, non-food animals, or animals less likely to find their way into the food chain, be used as bioreactors rather than animals that are a common source of food.

*Recommendation 7.6*

that, wherever possible, synthetic genes or mammalian homologues of human genes be used in transgenic animals to avoid the use of genes derived directly from humans.

*Recommendation 7.7*

that MAF develop an industry code of practice to ensure effective separation distances between genetically modified and unmodified crops (including those grown for seed production), such a code:

- to be established on a crop-by-crop basis
- to take into account

- existing separation distances for seed certification in New Zealand
- developments in international certification standards for organic farming
- emerging strategies for coexistence between genetically modified and unmodified crops in other countries
- to identify how the costs of establishment and maintenance of buffer zones are to be borne.

## **Chapter 8: Food**

### *Recommendation 8.1*

that the Food Administration Authority monitor research studies on stock feed and act on any that indicate a need for stock feed to be assessed in relation to human health.

### *Recommendation 8.2*

that Government facilitate the development of a voluntary label indicating a food has not been genetically modified, contains no genetically modified ingredients and has not been manufactured using a process involving genetic modification.

### *Recommendation 8.3*

that, as a matter of priority, the Food Administration Authority disseminate information on the labelling regime for genetically modified foods and consumer rights in relation to foods made available for consumption at restaurants and takeaway bars.

*Recommendation 8.4*

that the Food Administration Authority produce and distribute consumer information on the use of gene technology in the production of food.

**Chapter 9: Medicine***Recommendation 9.1*

that all gene therapy, whether in the public or the private sectors, require formal medical ethical oversight.

*Recommendation 9.2*

that Toi te Taiao : the Bioethics Council develop ethical guidelines for xenotransplantation involving genetic modification technology.

*Recommendation 9.3*

that products be clearly defined in legislation as medicines, pharmaco foods, functional foods or dietary supplements.

*Recommendation 9.4*

that imported medicines and pharmaco foods that include live genetically modified organisms be approved for use by Medsafe without a requirement for additional approval from ERMA.

*Recommendation 9.5*

that, in respect of applications for approval as Animal Remedies of genetically modified organisms or products manufactured by processes using genetic modification techniques, the specified information which the Director- General of Agriculture and Forestry requires to be contained in applications under the Agricultural Compounds and Veterinary Medicines Act 1997 (ACVM) include full information on the efficacy and the form of the genetic modification used in

manufacture; and that such information be included as one of the categories of relevant risks and benefits under section 19 of the Act.

*Recommendation 9.6*

that, as protocols identify useful therapeutics for serious disease control, approvals through ERMA and Medsafe be sought in advance for the importation of live genetically modified organisms in the form of vaccines.

**Chapter 10: Intellectual property**

*Recommendation 10.1*

that the New Zealand Plant Variety Rights Act 1987 be amended to introduce the concept of essential derivation.

*Recommendation 10.2*

that the Patents Act 1953 be amended by adding a specific exclusion of the patentability of human beings and the biological processes for their generation, in line with section 18 of the Patents Act 1990 (Commonwealth).

*Recommendation 10.3*

that a Maori Consultative Committee be established by the Intellectual Property Office of New Zealand to develop procedures for assessing applications, and to facilitate consultation with the Maori community where appropriate.

*Recommendation 10.4*

that New Zealand be proactive in pursuing cultural and intellectual property rights for indigenous peoples internationally.

*Recommendation 10.5*

that New Zealand pursue the amendment of the World Trade Organization Agreement on Trade-Related Aspects of Intellectual Property Rights and

associated conventions to include a reference to the avoidance of cultural offence as a specific ground for exclusion or reservation.

*Recommendation 10.6*

that all parties concerned work to resolve the WAI 262 and WAI 740 claims currently before the Waitangi Tribunal as soon as possible.

*Recommendation 10.7*

that HSNO and ACVM be amended to give appropriate protection to all commercially sensitive or confidential supporting information provided with applications for approval.

## **Chapter 11: Te Tiriti o Waitangi**

*Recommendation 11.1*

that section 8 of HSNO be amended to provide that effect is to be given to the principles of the Treaty of Waitangi.

**Chapter 12: Liability issues***Recommendation 12.1*

that Toi te Taiao : the Bioethics Council, in association with the Human Rights Commission, address the issue of genetic discrimination.

*Recommendation 12.2*

that for the time being there be no change in the liability system.

**Chapter 13: Major conclusion***Recommendation 13.1*

that the methodology for implementing HSNO section 6(e) be made more specific to:

- include an assessment of the economic impact the release of any genetically modified crop or organism would have on the proposed national strategy of preserving opportunities in genetically modified and unmodified agricultural systems
- allow for specified categories of genetically modified crops to be excluded from districts where their presence would be a significant threat to an established non-genetically modified crop use.

*Recommendation 13.2*

that before the controlled or open release of the first genetically modified crop, the Minister exercise the call-in powers available under HSNO section 68 in order to assess the likely overall economic and environmental impact on the preserving opportunities strategy.

*Recommendation 13.3*

that MAF develop formalised local networks to encourage constructive dialogue and communication between farmers using different production methods, and to provide for mediation where necessary.

*Recommendation 13.4*

that sterility technologies be one tool in the strategy to preserve opportunities, especially in the case of those genetically modified crops most likely to cross-pollinate with non-genetically modified crops in the New Zealand context (eg, brassicas, ryegrass, ornamentals).

**Chapter 14: The biotechnology century***Recommendation 14.1*

that HSNO section 68 be extended to include significant cultural, ethical and spiritual issues as grounds for the Minister's call-in powers.

*Recommendation 14.2*

that Government establish Toi te Taiao : the Bioethics Council to:

- act as an advisory body on ethical, social and cultural matters in the use of biotechnology in New Zealand
- assess and provide guidelines on biotechnological issues involving significant social, ethical and cultural dimensions
- provide an open and transparent consultation process to enable public participation in the Council's activities.

*Recommendation 14.3*

that Government establish the office of Parliamentary Commissioner on Biotechnology to undertake futurewatch, audit and educational functions with regard to the development and use of biotechnology in New Zealand.

*Recommendation 14.4*

that the Ministry of Research, Science and Technology develop on a consultative basis a medium- and long-term biotechnology strategy for New Zealand.

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